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Analysis of a tax amnesty's effectiveness in Indonesia

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ABSTRACT

This paper examines the effectiveness of an Indonesian tax amnesty program. Through descriptive quantitative analysis and a complementary empirical study, we find that the tax amnesty improved the tax base and tax revenue in the short run and positively affected tax compliance. The empirical analysis uses a sample of firms listed on the Indonesian Stock Exchange, chosen using certain firm characteristics that were then analyzed using panel data regressions. While the results may have limited generalizability and more research is needed on the long-term effects on tax amnesties, this study will be useful to Directorate General of Taxes in evaluating its tax amnesty policies.

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1. Introduction

Public awareness of taxation in Indonesia is quite low. Out of an adult population of over 185 million, only 28 million Indonesians (15%) are registered taxpayers, and of those only 10 million (26%) fulfill their tax obligations (Pramudito, 2015). The country's tax ratio—the ratio between tax revenue and gross domestic product (GDP)—is also low at 12%, as compared to 18% in other developing countries.

Indonesia's low level of tax revenue is due to widespread tax avoidance and tax evasion, as well as the underground economy, which accounts for 8% of GDP (Samuda, 2016). The underground economy consists of economic activities that are both legally and illegally omitted from the calculation of GDP (Schneider & Enste, 2000). The low level of tax revenue is also caused by the high amount of assets placed outside Indonesia to avoid domestic taxation. Most of these assets are placed in countries with lower tax rates or even zero tax rates (tax haven countries). This deprives the government of potential tax revenues and indicates that the government could do more to explore potential tax sources (Misbakhun, 2018). If these assets remained within Indonesia's financial system, the funds could contribute significantly to the country's economic development.

To address this problem, the Government of the Republic of Indonesia implemented a tax amnesty in 2016 and 2017. A tax amnesty is a limited-time opportunity for a specific group of taxpayers to pay a defined amount (redemption fees) in exchange for "forgiveness" of their tax liabilities (including interest and penalties) from a previous tax period without fear of criminal prosecution (Ernst & Young, 2016).

This initiative was also implemented to prepare Indonesia to adopt the Organization for Economic Co-operation and Development's (OECD) policy on the Automatic Exchange of Information (AEOI), which would assist the Director-General of Taxes in monitoring the overseas assets of Indonesian citizens. Under this policy, Indonesian citizens caught with income

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or assets that were not reported to the Director-General of Taxes would be subject to a penalty equal to 200% of the amount of unpaid income tax.

According to the President of the Republic of Indonesia, Joko Widodo, the implementation of Indonesia's tax amnesty program during 2016 and 2017 was a success. The wealth declared amounted to 4,884 trillion Indonesian rupiah (IDR) or 35% of the GDP (Directorate General of Taxes, 2017), the largest amount ever declared in a tax amnesty worldwide (approximately 10% of GDP).

To examine a tax amnesty's effectiveness, we should consider its performance in light of its goals. The stated goals of the Indonesian tax amnesty were to broaden the tax base, generate short-term revenues, and improve taxpayers' compliance (Republic of Indonesia, 2016). Thus, we explore three research questions: (1) Did the tax amnesty in Indonesia increase its tax base? (2) Did the tax amnesty in Indonesia increase tax revenue in the short run? (3) Did the tax amnesty affect taxpayers' compliance?

We take two approaches to answering these questions: descriptive and empirical. First, we describe the effect of the tax amnesty on tax revenue, the tax base, and tax compliance. Second, we empirically examine the effect of the tax amnesty on tax compliance by using a regression of the Indonesian Stock Exchange's (IDX) sample data.

Research related to tax amnesties was carried out by Alm et al. (1990), Alm and Beck (1993), Alm et al. (2009), Kara (2014), and Saracoglu and Caskurlu (2011). The use of tax amnesties did not affect tax revenues, except in Turkey in 1988 (Kara, 2014). Saracoglu and Caskurlu (2011) found that Turkey's tax amnesty reduced taxpayers' compliance. This happened because the tax amnesty program in Turkey was carried out repeatedly over a short period of time, so that the public lost trust in justice and the tax laws. In the short term, however, the tax amnesty in Turkey did increase the tax revenue there.

Yuan et al. (2012) examined the effect of regulatory changes to the tax laws on corporate tax avoidance by listed companies in China and found that tax avoidance was reduced as a result of regulatory reform. Alm et al. (1990) examined the effect of a tax amnesty on tax compliance using experimental research and showed that the average level of compliance decreased after an amnesty. But if post-amnesty enforcement efforts increased, aggregate compliance increased. Alm and Beck (1993) examined the effect of Colorado's tax amnesty on its tax revenue and compliance in the long run and found that the tax amnesty had no long run impact on either the tax revenues or compliance. Alm et al. (2009) examined the tax amnesty's effect on tax revenue in the Russian Federation and found that a tax amnesty does not affect tax revenue in the short or long term. In some cases, long-term revenue effects have been negative because tax evaders have been given lower tax rates under the amnesty program (Hamilton-Hart & Schulze, 2017). There is limited evidence that aggressive tax planning behavior is impacted by any tax amnesty program.

While Kara (2014) and Saracoglu and Caskurlu (2011) focused on the tax amnesty in Turkey, we focus on Indonesia's tax amnesty, analyzing it both descriptively and empirically. We used the annual reports and performance reports of Indonesia's Directorate General of Taxes (descriptive approach) and data from companies listed on the Indonesian Stock Exchange (IDX) (empirical approach) to evaluate the effects of Indonesia's tax amnesty on its tax base, tax revenue, and tax compliance.

This research makes several contributions to the literature and is of value to policymakers. First, it provides a rich case study of an effective tax amnesty program. By using the Directorate General of Taxes' annual and performance reports, we show that the 2016 to 2017 Indonesian tax amnesty had a positive effect on taxation revenues, the tax base, and taxpayers' compliance. Second, by analyzing a sample of non-financial companies listed on the IDX, we provide empirical evidence regarding the effect of the tax amnesty on corporate taxpayers' compliance in Indonesia. To the best of our knowledge, this study is the first to examine the effects of the 2016 to 2017 Indonesian tax amnesty on tax revenues, the tax base, and tax compliance both descriptively and empirically. This research will also be useful to the Indonesian government, especially the Directorate General of Taxes, in evaluating its tax amnesty policies. Finally, our research enriches knowledge on the effects of a tax amnesty in a developing country and hence will be useful to other developing countries that are considering implementing their own tax amnesty policies.

The remaining sections of the paper present the literature review and research question development, the methodology, the results and discussion, and the conclusions and suggestions for future research.

2. Background and research questions

2.1. Theoretical framework

An optimal taxation theory emphasizes the basic principles of tax collection: (1) equity, (2) efficiency, (3) neutrality, (4) simplicity, (5) transparency, and (6) economically efficient (Granger, 2013). This theory is used to analyze whether a tax amnesty is optimal for increasing the tax base, tax revenue, and tax compliance.

2.2. Tax amnesty

According to Regulation No. 11 of 2016 concerning the Tax Amnesty, the tax amnesty program eliminated the taxes that should have been owed. It did not subject people or corporations that owed taxes to any tax administration sanctions or criminal sanctions, as long as they revealed their assets and paid a set redemption fee of 0.5% to 10% of the value of the

net assets disclosed. Further provisions regarding the tax amnesty are explained in the Ministry of Finance Regulation No.118/PMK.03/2016 concerning the implementation of Law No. 11 of 2016 concerning the Tax Amnesty.

The purposes of the tax amnesty were as follows: (1) To accelerate the growth and the restructuring of the economy using the repatriation of assets, which was expected create positive impacts such as an increase in domestic liquidity, an improvement in the exchange rate of the rupiah, a decrease in financial interest rates, and an increase in investment. (2) To support the tax reforms in creating a system of taxation based on justice, and to expand the taxation database. (3) To increase tax revenues to fund development programs. The tax amnesty also aimed to repatriate assets and capital that Indonesian people and corporations had placed offshore to avoid paying taxes (Darussalam, 2014). Most of these assets and capital were in tax haven countries that had low or even zero tax rates, such as the Bahamas, Bermuda, the Cayman Islands, Luxembourg, Macau, and Singapore.

Indonesia's 2016–2017 tax amnesty took place in three phases. The first phase was from July 1, 2016 to September 30, 2016; the second was from October 1, 2016 to December 31, 2016; and the third was from January 1, 2017 to March 31, 2017. The redemption fee payable varied depending on the period of the tax amnesty. To encourage taxpayers to make early declarations, the first phase offered the most attractive redemption rates.

The tax amnesty was available to Indonesian individuals and corporate tax residents, with two major exceptions: taxpayers under investigation in the judicial process and taxpayers serving a criminal sentence for a taxation-related offense (Republic of Indonesia, 2016). The tax amnesty covered the fiscal years up to December 31, 2015. The reporting period for the tax amnesty (i.e., the window during which reports could be filed with the Indonesian tax office) was from July 1, 2016 to March 31, 2017.

Some key features of the Indonesian tax amnesty were as follows: a tariff was applied on a net asset basis with different percentages according to the amnesty period; cash had to be reported using its nominal value, while non-cash assets were reported using fair value; repatriated offshore assets had to be invested in Indonesian territory and retained in Indonesia for at least three years; onshore assets could not be transferred out of Indonesia for at least three years (Deloitte, 2016). Furthermore, the taxpayers were guaranteed that their data could not be accessed or used for investigation or prosecution by law enforcement agencies such as the Attorney General, the police, the Indonesian Corruption Eradication Commission (CEC), or the Indonesian Financial Transaction Reports and Analysis Centre (INTRAC) (Ministry of Finance Republic of Indonesia, 2016).

The tax amnesty encouraged taxpayers to disclose their assets and liabilities stored inside and outside Indonesia. It also encouraged taxpayers to repatriate their offshore assets back to Indonesia.

2.3. Tax amnesty and tax base

The tax base is obtained from data and information submitted by taxpayers. The income tax base is the amount of income that can be taxed. The government currently emphasizes the development of the database and information technology in the context of tax reform. One of the ways to strengthen the database is through a tax amnesty. The greater the number of taxpayers who register themselves and declare their assets, the larger the taxation database will become. This can increase the tax authorities' ability to explore potential sources of tax revenues in the following year and beyond and provide a basis for conducting tax audits.

By getting more tax evaders to register and declare their assets, a tax amnesty aims to improve revenue collection in the years to come, rather than generating only a one-time boost (Ernst & Young, 2016). The growth of the database lets the tax authorities explore the potential for increasing tax revenues. The access to income data that were previously invisible in the underground economy and the return of funds from abroad to Indonesia (repatriation) are expected to increase the tax base, which is then expected to increase tax revenues.

Research question 1: Did the tax amnesty in Indonesia increase its tax base?

2.4. Tax amnesty and tax revenue

Tax revenue is the nominal amount received by the tax office for the payment of taxes from the taxpayers. The revenue from the tax amnesty program includes general tax receipts (Income Tax, Value Added Tax, etc.) and the receipt of redemption fees. The additional tax revenue from redemption fees and fund repatriations due to the tax amnesty program can be used for Indonesia's infrastructure development and social programs and should therefore benefit society. A tax amnesty may increase the tax revenue in the short term, but it does little to increase the level of compliance (Alm et al., 2009). Indeed, there was an increased amount of tax evasion after an amnesty in Russia. An amnesty seems unlikely to generate one-time revenues, but it also seems unlikely to have significant negative effects on compliance in the long run (Alm & Beek, 1993).

Luitel and Sobel (2007) concluded that the revenue effect of a state's amnesty depends substantially on whether the state had previously offered an amnesty. Luitel and Sobel (2007) found that first amnesties produce a 4 to 5% increase in short-term revenue on average, whereas their non-compliance effect reaches up to 3% per period. Research by Baer and Le Borgne (2008) and Kara (2014) concluded that tax amnesties do not increase tax revenues in the long run, because they occur too frequently and thus have only a slight effect. Alm and Beck (1993), Alm et al. (2009), and Luitel and Mahar (2013), using time series analysis, found that governments did not raise significant revenue from their amnesty programs. This was consistent

with the findings of İpek et al. (2012), who stated that the revenues of certain cities in Turkey not only remained unimproved but also diminished in the long term.

Research question 2: Did the tax amnesty in Indonesia increase tax revenue in the short run?

2.5. Tax amnesty and tax compliance

One of the goals of the tax amnesty in Indonesia is to increase taxpayers' compliance. Tax compliance is the behavior of taxpayers in carrying out their tax obligations by following the applicable regulations. Compliant taxpayers are those who have fulfilled all their tax obligations. Low levels of tax compliance can happen for several reasons: a conflict of interest between the person and state, the taxpayers' lack of awareness of their obligations to the state, a lack of compliance with the government's regulations, a lack of respect for the law, high tax rates, and other environmental conditions such as government instability and corruption.

A tax amnesty encourages compliance by bringing tax evaders into the national tax system (Setiadi, 2016). A tax amnesty is a fair policy for all the taxpayers, which exposes them to the benefits of national development funding. Thus, it is posited that tax amnesties are a way of increasing tax compliance (Safrina et al., 2016). An amnesty will increase compliance if there is stronger law enforcement and better tax administration after the amnesty (Alm & Beck, 1993).

Any tax policy such as a tax amnesty must be widely publicized to all taxpayers. If they know the program's expected benefits, more taxpayers may participate and taxpayers' compliance will improve (Nuryati & Pratama, 2019). Implementing a tax amnesty by using a combination of law enforcement and fundamental moral and ethical appeals can increase voluntary tax compliance (Sudarma & Darmayasa, 2017). If a tax amnesty is managed professionally, publicized properly, and controlled optimally, it can help minimize income tax avoidance (Ibrahim et al., 2018). In general, tax amnesties have been most successful when they have been part of broad, credible tax reforms that provided strong incentives to pay taxes through increased enforcement, better administration, and, in some instances, lower top tax rates (Baer & Le Borgne, 2008; Hamilton-Hart & Schulze, 2017).

However, tax amnesties do not always succeed in increasing long-term tax compliance. In the US, a tax amnesty had the opposite effect (Alm et al., 1990). This may be because compliant taxpayers feel that tax amnesties are unfair because they give special treatment to tax evaders. This may also occur if the tax amnesty program is carried out several times over a short period. In that case, taxpayers may not comply because they anticipate that an upcoming tax amnesty program will eliminate the sanctions they face (Saracoglu & Caskurlu, 2011). The special treatment of non-compliant taxpayers could thus decrease law enforcement in Indonesia (Said, 2017). Other researchers conclude that compliance does not automatically increase after the granting of a tax amnesty (Sudarma & Darmayasa, 2017). Tax amnesty policies do not have significant effects on tax compliance because taxpayers use the amnesty programs merely to get their tax sanctions for non-compliance removed (Waluyo, 2017).

Research question 3: Did the tax amnesty in Indonesia affect taxpayers' compliance?

2.6. Research framework

Figs. 1 and 2 show the research framework used in this study.

3. Method

This research paper takes two approaches: descriptive and empirical. In the descriptive analysis, we describe the macro data from the annual and performance reports of the Directorate General of Taxes of the Republic of Indonesia. Using these data, we examined the effect of tax amnesties on the country's tax base, tax revenue, and tax compliance. The tax base is measured by calculating the amount of declared wealth and repatriated assets compared with GDP. Tax revenue is measured

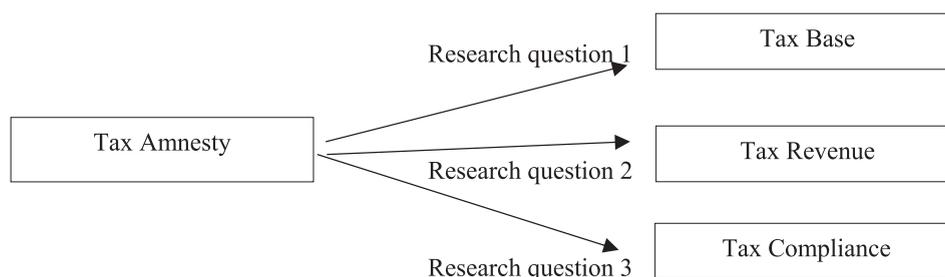


Fig. 1. Research framework of the descriptive analysis.

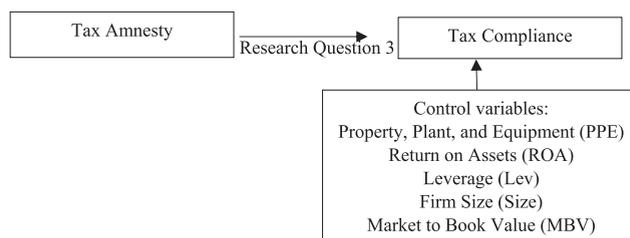


Fig. 2. Research framework of the empirical analysis.

by comparing the tax amnesty's redemption fees with the total tax revenue. Tax compliance is measured by using the tax ratio and tax coverage ratio over the years.

In the empirical analysis, we examined the IDX firms' data related to the effect of a tax amnesty on tax compliance. These secondary data were analyzed using a panel regression with STATA software. The population was non-financial firms listed on the IDX during the period from 2013 to 2018, and we formed the samples using the criteria shown in Table 1.

Non-financial firms were selected because these firms are subject to the same tax policies across industries. Moreover, financial firms have different characteristics in terms of their financial performance and tax regulations. The research period was from 2013 to 2018, which covers the years before and after Indonesia conducted its tax amnesty of 2016 and 2017. The post-amnesty period ends in 2018 because the 2019 data were not available yet (firms did not have to submit their 2019 annual reports until April 30, 2020). The years 2013 to 2015 cover the period before the tax amnesty.

Eq. (1) shows the research model (Yuan et al., 2012). The dependent variable was tax compliance, which was measured using tax avoidance. Firms with a high level of tax compliance will have a low level of tax avoidance. The independent variable was a tax amnesty dummy equal to 1 for firms using the tax amnesty, and 0 otherwise. Table 2 shows the variable definitions and operationalization used.

$$TaxAv_{i,t} = \alpha + \beta_1 TaxAm_{i,t} + \beta_2 PPE_{i,t} + \beta_3 ROA_{i,t} + \beta_4 LEV_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 MBV_{i,t} + \varepsilon_{i,t} \quad (1)$$

Tax avoidance is a form of tax non-compliance. We used this variable to investigate the effectiveness of a policy related to compliance at the business level (Dyregt et al., 2008). Higher levels of tax avoidance correspond with lower tax compliance.

Tax avoidance is measured by book-tax difference (BTD), permanent book-tax difference (PERMBTD), and effective tax rate (ETR). We chose these proxies because ETR, BTD, and PERMBTD showed the existence of tax avoidance activities even though there were still weaknesses. These proxies are also used by Chen et al. (2010), Hanlon and Heitzman (2010), and Yuan et al. (2012).

ETR shows the tax tariff per unit of currency. ETR is the actual rate that applies to corporate income taxpayers. ETR is calculated by dividing the tax paid by the income before tax. Lower ETR means a higher level of tax avoidance and a lower level of tax compliance. ETR is the most widely used proxy in research related to tax avoidance.

BTD is measured by the difference between earnings according to the accounts and earnings according to the tax due. BTD is believed to provide better information about tax avoidance than ETR. However, BTD can be caused by things other than tax avoidance. Studies using BTD include those by Chen et al. (2010) and Yuan et al. (2012).

In this research, we used the BTD measurement method developed by Manzon and Plezko (2002). BTD is calculated by subtracting the income before tax, based on the accounts, from the estimated taxable income. This method is simple compared to other more advanced methods, such as the BTD measurements by Desai and Dharmapala (2006) and Tang (2012), but it still gives consistent results (Chen et al., 2010).

The control variables used in this research were property, plant, and equipment (PPE), return on assets (ROA), leverage (LEV), firm size (SIZE), and market to book value (MBV). Previous research that these variables affect tax avoidance.

Firms with high PPE will also have high BTD. This is due to differences in their depreciation expenses, according to the accounting rules and the tax rules (Chen et al., 2010; Gunawan, 2016). This means that firms with higher PPE will have lower tax compliance. Firms with a high ROA tend not to be too aggressive, but they have more incentives to undertake tax plan-

Table 1
Sample selection criteria.

Criteria	Number of firms
Non-financial firms 2013–2018	781
Excluding firms not listed in IDX yet	(325)
Firms with no financial statement published	(42)
Firms with non-IDR currency for reporting	(66)
Firms with operating losses	(30)
Total number of firms in sample	318

Table 2
Variable definition and operationalization.

Variable	Definition and operationalization
$TaxAv_{i,t}$	<p>Tax avoidance as a proxy of tax compliance. The high level of tax avoidance means a low level of tax compliance (Yuan et al., 2012). Tax avoidance proxies:</p> <ol style="list-style-type: none"> 1. Total Book Tax Difference (BTD) (Manzon & Plezko, 2002) $TotalBTD_{i,t} = \frac{AI_{i,t} - TI_{i,t}}{Asset_{i,t-1}}$ <p>$TotalBTD_{i,t}$ = Total book tax difference $AI_{i,t}$ = Accounting income/pretax book income $TI_{i,t}$ = Taxable income $Asset_{i,t-1}$ = Total asset t-1 <ol style="list-style-type: none"> 2. Permanent Book Tax Difference (PERMBTD) (Manzon & Plezko, 2002; Khurana & Moser, 2009) $PermanentBTD_{i,t} = \frac{AI_{i,t} - TI_{i,t} - TempDiff_{i,t}}{Asset_{i,t-1}}$ <p>$PermanentBTD_{i,t}$ = Permanent book tax difference $AI_{i,t}$ = Accounting income/pretax book income $TI_{i,t}$ = Taxable income $TempDiff_{i,t}$ = Temporary difference $Asset_{i,t-1}$ = Total asset t-1 <ol style="list-style-type: none"> 3. Effective Tax Rate (ETR) (Dyreng et al., 2008) $ETR_{i,t} = \frac{CTE_{i,t}}{AI_{i,t}}$ <p>$ETR_{i,t}$ = Effective Tax Rate $CTE_{i,t}$ = Current Tax Expense $AI_{i,t}$ = Accounting Income/Pretax Book Income</p> </p></p>
$TaxAm_{i,t}$	Tax Amnesty , dummy variable equals 1 if company participates in tax amnesty program in year 2016–2017, and 0 otherwise
$PPE_{i,t}$	Net Property, Plant, and Equipment scaled by total asset t-1
$ROA_{i,t}$	Return on Asset : net income divided by total asset
$LEV_{i,t}$	Leverage , total debt divided by total asset
$SIZE_{i,t}$	Company size , natural logarithm of total asset
$MBV_{i,t}$	Market to book value ratio , market price of shares divided by book value of shares at the end of period

ning to reduce their tax burden (lower tax compliance). Firms with high leverage have high levels of debt. A large amount of debt incurs high interest expenses, which can encourage tax avoidance (discourage tax compliance). Loans to related parties are often used for tax avoidance purposes. A large firm size offers high economies of scale for tax avoidance, but it also has high political costs if the firm is examined by the Directorate General of Taxes (higher tax compliance). MBV is the proxy for a firm's growth. Firms that are still growing tend not to focus on tax efficiency, so we predict that MBV has a negative effect on tax avoidance (positive effect on tax compliance).

4. Results and discussion

4.1. Descriptive analysis

4.1.1. Tax base

The non-taxpayers who took advantage of the tax amnesty program had to declare their undisclosed wealth. This helped increase the tax base because the tax authorities could use the information to discover potential sources of fresh tax revenues. Below are some data on the disclosed wealth and repatriated assets.

Table 3 shows that Indonesia's tax amnesty reached almost 4,884 trillion rupiah, or 98% of the targeted declared wealth. This declared wealth consisted of repatriated assets that reached only 15% of the target, while domestic and overseas declarations accounted for up to 118% of the target. The repatriated wealth is still far from the set target.

The wealth declaration as a percentage of Indonesia's GDP and the redemption fees collected relative to its GDP are the largest to result from any tax amnesty in the world. Table 4 compares Indonesia's wealth declaration and redemption fees with those of Italy, Chile, Spain, and Australia.

Table 3
Wealth declared by tax amnesty participants in 2016–2017 (in IDR trillions).

Wealth declared	1st phase	2nd phase	3rd phase	Total	% of total	Target	% of target
a. Repatriated	130	11	6	147	3%	1,000	14.67%
b. Domestic Declaration	928	85	24	1,037	22%	4,000	118.44%
c. Overseas Declaration	2,609	533	558	3,701	75%		
Wealth Declaration Total	3,667	629	588	4,884	100%	5,000	97.68%

Source: Annual Report and Performance Report of Indonesia Directorate General of Taxes (2016, 2017).

Table 4

Wealth declared to GDP and redemption money to GDP ratio of Indonesia compared with Italy, Chile, Spain, and Australia.

Country	Wealth Declared (IDR trillions)	GDP (IDR trillions)	Wealth Declared/GDP	Redemption money (IDR trillions)	Redemption money/GDP	Year
Indonesia	4,884	13,559	36.02%	115	0.84%	2017
Italy	1,179	20,545	5.74%	59	0.29%	2009
Chile	263	3,367	7.81%	20	0.59%	2015
Spain	202	12,886	1.57%	18	0.14%	2012
Australia	66	18,191	0.36%	8	0.04%	2014

Source: Center for Indonesia Taxation Analysis (2016).

Table 5

Wealth declared based on taxpayer type during tax amnesty 2016–2017 (in IDR trillions).

Declared wealth	Private person	Entity	Total
Domestic declaration	3,074.65	626.15	3,701
Overseas declaration	1,003.87	32.89	1,037
Repatriated	121.14	25.56	147
Total	4,199.66	684.60	4,884
Percentage of total	86%	14%	100%

Source: Annual Report and Performance Report of Indonesia Directorate General of Taxes (2016, 2017).

The majority of participants in the tax amnesty were private taxpayers, who made up 76% of the participants and provided 86% of the wealth declared, as seen in [Tables 5 and 6](#). Corporate taxpayers accounted for only 24% of the participants and 14% of the wealth declared. This shows that there is still a lot of undeclared wealth among private taxpayers in Indonesia. Only a small number of businesses took part in the amnesty, perhaps because financial audits and tax audits are legally required for corporate taxpayers, so they are much less likely to hide undeclared wealth. The wealth declared after the tax amnesty increased the tax base, as the tax authority could use the resulting data to pursue potential tax revenues in the future.

4.1.2. Tax revenue

A tax amnesty increases tax revenue in the short term. [Table 7](#) shows tax revenue from redemption fees, which accounted for 9% of overall tax revenues in 2016 and 2017. If the purpose of a tax amnesty is to raise additional revenue in the year it is implemented, then the Indonesian tax amnesty could be said to be successful. This additional revenue could be used for additional government spending to boost development and build infrastructure to increase the welfare of society.

The second analysis of tax revenue compares the realized tax revenue with the targeted tax revenue. [Table 8](#) shows that realized tax revenue represents a decreasing percentage of targeted tax revenue over the years. There was a significant increase in the targeted revenue for 2015 (up to 20%), which caused the target revenue's percentage of realized revenue to fall significantly, down to 10%. After the tax amnesty period, there was an 8% increase in the targeted revenue, and this continued with a 3% rise in 2018.

[Table 8](#) also shows that during the amnesty period in 2016 and 2017, tax revenue (including the redemption fees) grew by only 4.24% and 4.09%. This low level of growth may have happened for several reasons: (1) there was an increase in the non-taxable income for personal taxes; (2) there was a decrease in imports; and (3) there was a decrease in government spending in 2016. In 2017, there was no more incentive to reevaluate fixed assets, as stated in the Ministry of Finance Regulation No. 191/PMK.010/2015, so the tax revenue from such revaluations decreased. Still, we can conclude that the tax amnesty increased tax revenue because the redemption fees contributed 9% to the overall tax revenue in 2016 and 2017, as [Table 7](#) shows.

As [Table 9](#) shows, the tax ratio decreased from 2012 to 2017. There was a stable increase in GDP growth of about 9%, but revenue fluctuated significantly below the GDP growth rate, by as much as 3% in 2015. This trend changed in 2018, when revenue increased by 18% (almost two times the GDP growth). Thus, the tax ratio became larger, increasing for the first time since the decreases from 2012 to 2017. These numbers show that there was an increase in the tax ratio when the tax amnesty was enforced. But other factors that we did not study in this paper may also have influenced the increase in the tax ratio.

We analyzed the effect of the tax amnesty on tax revenues in the years of the amnesty program (2016 to 2017) and the year after it (2018) and found that tax revenue increased after the tax amnesty. This result supports the findings of [Alm et al. \(2009\)](#), [Alm and Beek \(1993\)](#), and [Luitel and Sobel \(2007\)](#). However, we analyzed only a short period with limited data, so further research using richer data is needed to find out the effect of the tax amnesty in the long run.

Table 6
Number of tax amnesty participants.

	1st Phase	2nd Phase	3rd Phase	Total	Private Person	Entity
Tax Amnesty Participant	393,358	223,000	357,068	973,426	736,093	237,333
Percentage of total	40%	23%	37%	100%	76%	24%

Source: Annual Report and Performance Report of Indonesia Directorate General of Taxes (2016, 2017).

Table 7
Ratio of redemption money to tax revenue (in IDR trillions).

	Redemption money	Tax revenue	Percentage of redemption money to tax revenue
2016	103.04	1,105.81	9.32%
2017	114.54	1,151.03	9.95%

Source: Annual Report and Performance Report of Indonesia Directorate General of Taxes (2016, 2017).

Table 8
Ratio of realization to targeted tax revenue (in IDR trillions).

Year	Tax revenue realization	Targeted tax revenue	Percentage of realization to target	Realization growth	Target growth
2013	921.27	995.21	92.57%	–	–
2014	981.83	1,072.37	91.56%	6.57%	7.75%
2015	1,060.83	1,294.26	81.96%	8.05%	20.69%
2016	1,105.81	1,355.20	81.60%	4.24%	4.71%
2017	1,151.03	1,283.57	89.67%	4.09%	–5.29%
2018	1,315.51	1,424.00	92.38%	14.29%	10.94%

Source: Annual Report and Performance Report of Indonesia Directorate General of Taxes (2013, 2014, 2015, 2016, 2017, 2018).

Table 9
Tax ratio (tax revenue to GDP ratio) (in IDR trillions).

Year	Tax revenue	GDP	Tax Ratio	Revenue Growth	GDP Growth
2012	1205.35	8,615.70	13.99%	–	–
2013	1,278.28	9,546.13	13.39%	6.05%	10.00%
2014	1,387.72	10,569.71	13.13%	8.56%	10.72%
2015	1,341.39	11,531.72	11.63%	–3.34%	9.10%
2016	1,349.87	12,406.81	10.88%	0.63%	7.58%
2017	1,454.63	13,588.80	10.70%	7.70%	9.52%
2018	1,717.68	14,837.36	11.58%	18.00%	9.18%

Source: Annual Report and Performance Report of Indonesia Directorate General of Taxes, Indonesia Central Bureau of Statistics (2012, 2013, 2014, 2015, 2016, 2017, 2018).

4.1.3. Tax compliance

We analyzed the rate of tax compliance after the tax amnesty using the tax coverage ratio. The tax coverage ratio is the ratio of the number of tax letters submitted to the number of taxpayers that should report. Table 10 shows that the coverage ratio increased from 2012 to 2017, but the growth in the ratio decreased from 2013 until 2016. There was a significant increase in the tax coverage ratio in 2017, from 60.82% to 72.64%. This happened due to the decreasing number of taxpayers who should have submitted a tax letter. In 2016, there was an increase in the non-taxable income for individual taxpayers, which meant that the number of taxpayers who should have submitted a tax letter also decreased.

Table 10
Tax coverage ratio (number of tax letters submitted divided by the number of taxpayers who should report).

Year	Number of tax letters	Number of taxpayers who should report	Tax coverage ratio	Growth
2012	9,237,948	17,659,278	52.31%	–
2013	9,966,834	17,731,736	56.21%	7.46%
2014	10,852,304	18,357,833	59.12%	5.18%
2015	10,972,529	18,159,840	60.42%	2.20%
2016	12,264,131	20,165,718	60.82%	0.66%
2017	12,057,400	16,598,887	72.64%	19.43%
2018	12,551,444	17,653,046	71.10%	–0.02%

Source: Annual Report and Performance Report of Indonesia Directorate General of Taxes (2012, 2013, 2014, 2015, 2016, 2017, 2018).

From the discussion above, we can see that although tax compliance increased over the years, the trend was decreasing. In the next section, we further analyze the effect of the tax amnesty on tax compliance using empirical analysis.

4.2. Empirical analysis

Table 11 shows the descriptive statistics for the variables. There are 32 firms with a TaxAm score equal to 1, which means that 32 firms in the sample participated in Indonesia's tax amnesty program. Table 11 indicates that the means for BTD and PERMBTD are 0.0053 and 0.0088. This means that the total book tax difference and the permanent book tax difference are 0.53% and 0.88% compared with the previous year's total assets. The mean for ETR indicates that the current tax expense is 43.58% of the sample firms' accounting income.

Table 12 provides the correlation matrix of the variables. The correlation among the variables is low and does not seem to pose any multicollinearity concerns. The correlation matrix indicates positive associations between tax amnesty and tax compliance.

Table 13 shows the regression results of the tax amnesty's effect on tax compliance with three different proxies: the book-tax difference (BTD), the permanent book-tax difference (PERMBTD), and the effective tax rate (ETR). We find signif-

Table 11
Descriptive statistics of main variables.

Variable	Mean	Std. Dev.	Min	Max
BTD	0.0053	0.0314	-0.0973	0.1022
PERMBTD	0.0088	0.0505	-0.1487	0.1620
ETR	0.4358	0.9994	-2.7735	3.5017
PPE	0.5287	0.3347	0.0371	1.4825
ROA	0.0852	0.0875	0.0000	0.3947
LEV	0.1506	0.1596	0.0000	0.6630
SIZE	28.6235	1.6474	25.6194	33.3415
MBV	3.4345	4.3860	0.0449	16.6839
Variable TaxAm	No of sample with category 1 = doing tax amnesty 32			% of total 10.06

Note: For variable definitions, see Table 2.

Table 12
Pearson correlation matrix of main variables.

	TaxAm	BTD	PERMBTD	ETR	PPE	ROA	LEV	SIZE	MBV
TaxAm	1								
BTD	-0.0055	1							
PERMBTD	-0.0020	-	1						
ETR	-0.0127	-	-	1					
PPE	-0.1309	0.0135	-0.0182	-0.0602	1				
ROA	-0.1149	0.1517	0.1952	-0.0377	-0.0265	1			
LEV	0.1281	-0.0058	-0.0658	0.0893	0.0489	-0.4034	1		
SIZE	-0.0395	-0.0469	-0.0319	0.0994	0.0328	0.0706	0.0337	1	
MBV	-0.0498	0.1050	0.0881	-0.0138	-0.0505	0.5262	-0.2050	0.2805	1

Note: For variable definitions, see Table 2. No correlations among variables are significant at $p < 0.01$ or $p < 0.05$.

Table 13
Regression results of empirical analysis.

Variables	Proxy	Tax Compliance (-BTD)		Tax Compliance (-PERMBTD)		Tax Compliance (ETR)	
		Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
TaxAm	+	0.0069	0.066*	0.0122	0.056*	0.0327	0.421
PPE	-	0.0005	0.443	0.0049	0.224	-0.4078	0.002***
ROA	-	-0.0665	0.030**	-0.1105	0.004***	0.6178	0.242
LEV	-	-0.0089	0.239	-0.0029	0.445	0.1829	0.342
SIZE	+	0.0037	0.289	0.0083	0.224	-0.1726	0.232
MBV	+	-0.0010	0.012**	0.0007	0.171	0.0057	0.365
N			318		318		318
R-squared			0.631		0.585		0.294
Prob (F-stat)			0.000		0.000		0.000

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. For variable definitions, see Table 2.

ificant positive effects of the tax amnesty on tax compliance when using BTD and PERMBTD. When we use ETR, tax amnesty does not have significant effect on tax compliance.

BTB and PERMBTD are believed to provide better information about tax avoidance than ETR (Chen et al., 2010; Yuan et al., 2012). We therefore conduct further analysis using the BTB and PERMBTD proxies.

We find that Indonesia's tax amnesty increased taxpayers' compliance by bringing tax evaders into the national tax system again. The Directorate General of Taxes can use the data on tax amnesty participants to monitor their compliance in the future. This result confirms the findings of Safrina et al. (2016) and Setiadi (2016). A tax amnesty is a fair policy for all taxpayers because they benefit from increased national development funding. We can see that Indonesia's tax amnesty was managed professionally, publicized properly, and controlled optimally, so it has a positive impact by maximizing tax compliance as in Ibrahim et al. (2018).

According to optimal taxation theory, the basic principles of tax collection are (1) equity, (2) efficiency, (3) neutrality, (4) simplicity, (5) transparency, and (6) economic efficiency (Granger, 2013). Indonesia's tax amnesty followed these six principles and hence increased taxpayers' compliance. Previous research suggests that tax amnesties are most successful when they are just one element of a larger, credible tax reform that provides strong incentives to pay taxes through increased enforcement, better administration, and, in some instances, lower top tax rates (Baer & Le Borgne, 2008; Hamilton-Hart & Schulze, 2017).

From Table 13, where we use BTB and PERMBTD as proxies, we see that ROA had a significant negative effect on tax compliance. Firms with a high ROA have more incentives to engage in tax planning, to reduce their tax burdens. This means that the higher the ROA, the lower the level of tax compliance. When we use BTB as a proxy, MBV has a negative effect on tax compliance. Firms with high growth rate (high MBV) still try avoiding taxes (i.e., they have a low level of tax compliance).

When using ETR as a proxy, we see that PPE has a significant negative effect on tax compliance. This is due to differences in the depreciation expenses according to the accounting and tax rules (Chen et al., 2010; Gunawan, 2016).

5. Conclusions, implications, and limitations

The Government of the Republic of Indonesia implemented a tax amnesty from 2016 to 2017 to address problems of tax avoidance, tax evasion, and the underground economy. This tax amnesty program aimed to increase tax revenues in the short term, increase the tax base, and increase the tax compliance among taxpayers. To investigate the amnesty's effectiveness in achieving these goals, we examined Indonesia's post-amnesty tax revenue, tax base, and tax compliance. In a complementary empirical analysis, we also examined the effect of the tax amnesty program on the tax compliance of firms listed on the Indonesian Stock Exchange.

The results show that the tax amnesty increased tax revenue in the short term, increased the tax base, and affected tax compliance in Indonesia. The empirical analysis shows that the tax amnesty positively affected the tax compliance of firms listed on the Indonesian Stock Exchange. These findings suggest that Indonesia's tax amnesty achieved its stated goals of increasing tax revenues, the tax base, and tax compliance.

The 2016–2017 tax amnesty in Indonesia succeeded because Indonesia had a higher level of tax law enforcement and tax reformation than before. The government had previously implemented tax amnesty programs in 1964 and 1984. The tax amnesties of 1964 and 1984 were unsuccessful because the tax administration system was inadequate at that time, and there was no adequate legal enforcement (Huda & Hernoko, 2017).

We acknowledge the following limitations of this research. Because of its brief period of observation, this study examines only the short-term effects of the tax amnesty. The impact over the long term needs to be examined further. Furthermore, although ETR and BTB are commonly used proxies for tax avoidance, some of the literature criticizes the accuracy of financial statements based on tax avoidance measures. Despite its limitations, this research is important because it can be useful to the Indonesian government, especially the Directorate General of Taxes, in evaluating policies related to tax amnesties. This paper is also useful for other countries, especially developing countries, in evaluating and preparing tax amnesty policies.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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