Ilomata International Journal of Tax & Accounting



P-ISSN: 2714-9838; E-ISSN: 2714-9846

Volume 4, Issue 3 July 2023

Page No. 385-406

Repeated Tax Amnesties in Indonesia: An Evaluation of Tax Compliance

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Received: May 1, 2023

Accepted : June 11, 2023

Published: July 31, 2023

Citation: Indradi (2023). Repeated Tax Amnesties in Indonesia: An Evaluation of Tax Compliance. Ilomata International Journal of Tax and Accounting, 4(3),385-406. https://doi.org/10.52728/ijtc.v4i3.759 **ABSTRACT:** For some countries, tax amnesty is viewed as a shortcut tool to raise additional tax revenue. However, many of them seem to be unaware of the medium to longterm impact to tax compliance. Indonesia has already launched two tax amnesties between 2016 and 2022, yet there have been no comprehensive studies to evaluate long term compliance impact of the amnesties in Indonesia. This study aims to evaluate the impact of repeated tax amnesties in Indonesia from a tax compliance perspective. It focuses on the medium to long-term effects and uses income tax revenue as a variable to measure tax compliance. The research methods employed in the study are both qualitative and quantitative, allowing for a comprehensive examination of the topic. One important aspect of the study is the use of time series analysis with an ARIMA model to analyse the income tax revenue. This analysis helps in understanding the trends and patterns in income tax revenue over time and allows for the identification of any significant changes or impacts caused by the tax amnesties. The findings in this study align with other previous research, which indicate that tax amnesty does not affect long-term tax revenue and may adversely influence medium to long-term compliance. It can also cause a decline in short-term compliance, particularly when taxpayers expect repeated amnesties.

Keywords: Tax Amnesty, Tax Compliance, Income Tax Revenue, Time Series Analysis, ARIMA



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INTRODUCTION

There are several driving factors as well as goals of tax amnesty. The main factors and goals of tax amnesty are increasing short, medium, and long-term tax revenue, broadening taxpayers base, and ultimately improving tax compliance (Baer & Le Borgne, 2008) (Damayanti et al., 2020). From those factors, the majority of tax scholars agree that tax amnesty increases short-term tax revenue.

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However, some studies show that tax amnesties do not affect medium and long-term revenue, let alone improving tax compliance (Sabnita, 2019).

Tax amnesty is indeed a contentious issue amongst policymakers and tax scholars. On one side, it is perceived to be an effective tool to raise short term revenue(Alm & Beck, 1990) (Baer & Le Borgne, 2008) (Sabnita, 2019). On the other side, it is often regarded as unfair policy because it accommodates and treats tax evaders, including tax criminals, with much lower tax burden compared to compliant taxpayers. Furthermore, tax amnesty can also be viewed as weaknesses of tax administration and law enforcement from the perspective of the tax authority (Pohan et al., 2019).

Many countries, even in provincial or state level, have implemented tax amnesty in various forms (<u>Baer & Le Borgne, 2008</u>) (<u>Sabnita, 2019</u>) From the perspective of short-term revenue, some countries can be classified as successful and some other are the opposite (<u>Baer & Le Borgne, 2008</u>) (<u>Luitel & Sobel, 2007</u>). However, measuring tax amnesty only from this perspective can mislead the holistic triumph of the amnesty, which is incremental increase of taxpayers' compliance.

Indonesia has experienced five times implementation of tax amnesty with different backgrounds, schemes and mechanisms (Assidiki Mauluddi & Widyawati, 2022). The First amnesty had been applied before so called "Tax Reform 1983", which was in 1964. The second was held in 1984, one year after the reform. The third had been implemented in 2008 and become a milestone of second-phase tax reform in Indonesia. Nevertheless, this third amnesty is well known as sunset policy and it has quite different features and scheme compared to other amnesties. The fourth and fifth had been applied in 2016 to 2017 and 2022. Although, the last one refers to what is called "Voluntary Disclosure Program", but the scheme is basically similar with other amnesties.

There is plethora of books and articles that explain, analyse, and describe tax amnesty. Many of them discuss tax amnesty and its effect to tax compliance and revenue. However, to the best of my knowledge, hardly any of those discuss repeated tax amnesty in Indonesia and its effect to medium and long-term revenue, which could be argued as prima facie evidence of tax compliance. Many studies use survey to measure the compliance level of the taxpayer, which is conceivable, considering that taxpayers' identity and data are classified. One approach of study to fathom tax compliance through its proxy, which is long-term revenue, such as conducted by James Alm and William Beck (1993) is very relevant. Medium and long-term tax revenue is an appropriate figure to define taxpayer's compliance level because it represents the ultimate goal of compliance, which is tax burden paid by the taxpayers. The approach is followed by some other studies with similar approach, such as conducted by Gerger (2012) and Villalba (2017).

This study discusses brief history of tax amnesties in Indonesia, measures and evaluates the effectivity of the two last amnesties in terms of increasing taxpayers' compliance. Measurement method of the amnesties' effectivity is based on long-term revenue projection as a proxy of the compliance, similar with study conducted by Alm and Beck (1993). The revenue will be represented by income tax revenue instead of taxes revenue in a whole considering that commonly, the ransom in tax amnesty program is a substitution of income tax liability that should be paid in the past. The projection of income tax revenue will be created with time series analysis using ARIMA model.

METHOD

Qualitative and quantitative research method are used in this paper. The qualitative method will be used in the discussion and synthesis of previous research, brief history of tax amnesties in Indonesia and statistical description of the three last amnesties. Meanwhile, the quantitative method will be adopted in measurement and analysis of the three last amnesties in Indonesia in terms of long-term income tax revenue as a proxy of tax compliance. The three last amnesties, which are implemented on 1 January 2008 to 28 February 2009, 1 July 2016 to 31 March 2017, and in 2022, are the basis of discussion in this paper considering that these three events are the most influential to the current compliance condition in Indonesia. This paper is going to follow Alm and Beck (1993) method (time series analysis) using Auto Regressive Integrated Moving Average (ARIMA) model, which is designed with RStudio, to make a forecasting of income tax revenue. The ARIMA model will be used to make a forecasting of income tax revenues from 2023 to 2042 and the observed income tax revenues as projection bases are from 2002 to 2022. Nevertheless, since this study measures the long-term compliance with one variable through time series analysis, it might be followed by other studies providing other variables to assess the long-term impact of repeated amnesties.

RESULT AND DISCUSSION

1. Theoretical Framework

Many studies of tax amnesties in various regions discuss tax amnesties and its effect on tax compliance, some other analyse amnesties in relation with tax revenue. Nevertheless, there is a niche between those two main issues in amnesty, that is trying to connect tax amnesty and tax revenue as a projection of compliance. In the context of Indonesia, the majority of tax amnesty's research either designed purely using literature review or perceptive survey method. However, there are fewer studies analyse the effect of repeated tax amnesties, especially in Indonesia.

Tax amnesty has three general features, which are specific or limited time of implementation, the target of this program is non-compliant taxpayers or tax avoiders, and the benefit for the participants is much lower tax burden (sometimes called ransom) than the normal tax rate as well as freedom from sanctions and legal prosecution (Baer & Le Borgne, 2008) (Gerger, 2012). The ultimate goal of those three features is to attract as many as possible existing non-compliant taxpayer to join the program and to be registered in the tax administration, therefore broadening tax base and increasing tax compliance. It is reasonable that the specific target of tax amnesty participants is partially or fully non-compliant taxpayers, because this group obtain the largest benefit of the amnesty compared to fully compliant taxpayers, who are suffering from unfair treatment (Saraçoğlu & Caskurlu, 2011) (Gerger, 2012) (Sayidah & Assagaf, 2019).

As mentioned earlier, tax amnesty has two dimensions of objectives, which are short to mediumterm goals and medium to long-term goals. The first dimension can be predicted and achieved relatively easy because the results are immediate and temporary in nature, such as generating significant amount of revenue, immediate responses from taxpayers who are previously unregistered or unidentified in the tax administration or partially compliant taxpayers who are already administered or registered but do not pay tax and/or submit tax return. The most difficult part is achieving the medium to long-term goal, which is retaining and even improving tax compliance level that is already gained in the short-term period.

The implementation of tax amnesties in various countries or states have different backgrounds or triggers. However, it could be argued that, like any other tax policies or measures, the ultimate objective of the amnesties is to increase the level of tax compliance or voluntary compliance. Improving voluntary tax compliance, along with discussion of imposing tax itself, is an old subject (e Hassan et al., 2021). The definition of tax compliance is simple, which is basically the degree of individual and other tax subjects' ability and willingness to comply with or satisfying the tax laws (Sarker, 2003) (James et al., 2002) (e Hassan et al., 2021). Furthermore, the definition of tax compliance contains two aspects which are formal compliance and material compliance. Formal compliance relates to compliance of non-paying obligations in the tax laws, such as registration and on-time filing of tax return. Meanwhile, material compliance relates to willingness to pay taxes in accordance with the tax laws.

Considering that the material compliance is basically represented by the amount of tax revenue, especially income tax, therefore measuring tax compliance using income tax revenue as a proxy is relevant. The approach that is trying to connect tax amnesty and tax revenue has been applied by Alm and Beck (1990) and then followed by a study to measure long run compliance using time series analysis as an effect of repeated tax amnesties (Alm & Beck, 1993). Finding in the first paper is that amnesties may increase tax compliance and revenue if a taxpayer believes that paying taxes is an obligation and assumes that future amnesty will apply tougher enforcement than current amnesty (Alm & Beck, 1990). However, another possible argument is that the amnesty revenue will reduce current tax payment, especially if a taxpayer anticipates future amnesty with lax of penalty (Alm & Beck, 1990). Meanwhile in the second paper, the finding is that tax amnesties will not have a significant effect on long-term compliance or tax revenue. Even, the amnesties might cause lower or dropped tax revenue in subsequent years, unless it is followed with stronger penalty or enforcement.

Time series analysis is used in this paper with several reasons. First, the projection of future tax revenue in this paper is designed to make a conclusion whether tax amnesties will have a significant impact on medium to long-term tax compliance rather than to make accurate or precise future values of the revenue. Therefore, past movements of a variable are enough to infer the future movements without considering other variables as causal factors (Alm & Beck, 1993). Second, some research on tax amnesties in Indonesia are designed using survey or experimental study to draw conclusions regarding level of compliance. However, in my view, this method is not suitable to measure the level of compliance due to reliability of the survey participant's view including false information and comprehension of the participants and participants representativeness (Herbert, 2013).

ARIMA model is a popular statistical method to analyse an interpret time-series data for making future prediction values. An ARIMA model has three components which are Autoregression (AR), Integrated (I), and Moving Average (MA). The Autoregression, denoted by "p", means that the model shows that a changing variable is regressed on its prior values or lagged values. The Integrated, denoted by "d" refers to the stationarity of the data which means that the time-series data has to be stationary by subtracting observed value and its previous values d times. The non-stationary data can be made stationary by differencing (Box et al., 2016). Moreover, the Moving

Average, denoted by "q", indicates error of the model that uses previous forecast errors in regression-like model like model.

The equation model of ARIMA or sometimes referred as Box-Jenkins model as suggested by the components are as follows:

1) Autoregressive model:

$$Y_t = \Phi_0 + \Phi_1 Y_{t-1} + \Phi_2 Y_{t-2} + \dots + \Phi_p Y_{t-p} + e_t$$
 where:

 Y_t = dependent variable Φ = constant term $Y_{t-1}, Y_{t-2}, Y_{t-p}$ = the lag of Y p = order of p

*e*_t = error term, which is assumed to be normally distributed with a mean of zero and constant variance.

2) Moving Average model:

$$Yt = \alpha_0 - \alpha_1 e_{t-1} - \alpha_2 e_{t-2} - \alpha_3 e_{t-3} - \cdots - \alpha_q e_{t-q}$$

where:

 Y_t = dependent variable α = constant term $e_{t-1}, e_{t-2}, e_{t-q}$ = the lag of error

q =order of q

*e*_t = error term, which is assumed to be normally distributed with a mean of zero and constant variance.

3) ARIMA Model:

 $Y_t = \Phi_0 + \Phi_1 Y_{t-1} + \Phi_2 Y_{t-2} + \dots + \Phi_p Y_{t-p} + e_t + \alpha_0 - \alpha_1 e_{t-1} - \alpha_2 e_{t-2} - \alpha_3 e_{t-3} - \dots - \alpha_q e_{t-q}$ whereas "d" is order of differencing which is the number of differencing to make the data stationary (Box et al., 2016).

Although, ARIMA model can be highly accurate and reliable, but it has main drawback. The drawback is determining the parameters (p,d,q) can be a trial-and-error process and quite difficult. However, this disadvantage is no longer an exhaustion effort with the help of some statistical application, such as SPSS and RStudio. Therefore, this study builds the ARIMA model assisted with RStudio

Table 1 summarises some relevant previous studies other than study already mentioned concerning tax amnesty and tax compliance, especially in Indonesia.

Table 1. Previous Reserach

Researcher Year		Method	Conclusions	
James Alm,	1990	Experimental study with 7	Overall level of tax compliance drops after	
Michael scenarios (sessions) and 9		scenarios (sessions) and 9	an amnesty, although the impact could be	
Mckee,		hypotheses using various	reduced with stiffer law enforcement. The	
William		tests, such as Mann-	combination of amnesty and enforcement is	
Beck			more effective in generating compliance	

		Whitney non-parametric	than law enforcement alone (Alm et al
		test	<u>1990)</u> .
Hari Sharan	2007	Regression analysis using a	overall, when a state offers an amnesty for
Luitel,		panel of quarterly data on	the first time, it significantly improves
Russel S.		tax revenue for the U.S.	short-run revenue during the amnest
Sobel		states over the 1980-2004	period but then leads to a reduction i
			revenue in the long-run (Luitel & Sobel, 2007
Ngadiman,	2015	Perception survey, study	Sunset policy does not affect ta
Daniel		at Jakarta Kembangan Tax	compliance, meanwhile tax amnesty an
Huslin		Office, Participant: 100	penalties affect tax compliance (Ngadiman d
		individual taxpayers,	Huslin, 2015).
		regression analysis	
Miguel A.	2017	Analysis using Expected	Tax amnesties increase short-run revenu
Sanchez		Utility Theory (Allingham	but do not affect long-term revenu
Villalba		<u>& Sandmo, 1972</u>), data:	(Sanchez Villalba, 2017).
		Sales Tax Revenue, GDP,	•
		and tax amnesties of	
		Tucuman Province,	
		Argentina form May 1978	
		to September 1999	
Fany	2020	Perception survey,	trust to the government significantly
Inasius, Giri		Participant: 410 self-	influences voluntary compliance but sma
Darijanto,		employed individual	negative effect to enforced compliance
Engelwati		taxpayers (SME's),	Government power is more important to
Gani, and		regression analysis	voluntary than enforced compliance (Inasiu
Gatot			et al., 2020)
Soepriyanto			
Ni Putu	2021	Experimental study,	If taxpayers do not know that tax amnest
Riasning,		Darticipant, 410 students	
		rancipant. 410 students,	will be repeated, they tend to be more
0		2x2 factorial designs,	
Anak Agung		=	
Anak Agung Bagus		2x2 factorial designs,	compliant. Tax sanctions also pla
Anak Agung Bagus Amlayasa,		2x2 factorial designs, involving two variables:	compliant. Tax sanctions also pla significant effect to the compliance leve
Anak Agung Bagus Amlayasa, Luh Kade		2x2 factorial designs, involving two variables: knowledge of recurring	compliant. Tax sanctions also pla significant effect to the compliance leve These two joint variables affect ta
Anak Agung Bagus Amlayasa, Luh Kade Datrini	2022	2x2 factorial designs, involving two variables: knowledge of recurring amnesties and tax	compliant. Tax sanctions also pla significant effect to the compliance leve These two joint variables affect ta compliance (<u>Riasning et al., 2021</u>)
Anak Agung Bagus Amlayasa, Luh Kade Datrini Bambang	2022	2x2 factorial designs, involving two variables: knowledge of recurring amnesties and tax sanctions	compliant. Tax sanctions also pla significant effect to the compliance leve These two joint variables affect ta
Anak Agung Bagus Amlayasa, Luh Kade Datrini Bambang Juanda,	2022	2x2 factorial designs, involving two variables: knowledge of recurring amnesties and tax sanctions Experimental study uses	compliant. Tax sanctions also plate significant effect to the compliance level. These two joint variables affect tax compliance (Riasning et al., 2021) Wealthier taxpayer tends to not comply, tax penalties along with higher auditions.
Anak Agung Bagus Amlayasa, Luh Kade Datrini Bambang Juanda, Lukytawati	2022	2x2 factorial designs, involving two variables: knowledge of recurring amnesties and tax sanctions Experimental study uses Factorial Randomized	compliant. Tax sanctions also plate significant effect to the compliance level. These two joint variables affect tax compliance (Riasning et al., 2021) Wealthier taxpayer tends to not comply, tax penalties along with higher audity probabilities have significant impact of
Anak Agung Bagus Amlayasa, Luh Kade Datrini Bambang Juanda, Lukytawati Anggraeni,	2022	2x2 factorial designs, involving two variables: knowledge of recurring amnesties and tax sanctions Experimental study uses Factorial Randomized Block Design (RAKF)	compliant. Tax sanctions also plate significant effect to the compliance level. These two joint variables affect tax compliance (Riasning et al., 2021) Wealthier taxpayer tends to not comply, tax penalties along with higher audit probabilities have significant impact of compliance. Tax Amnesty could reduce tax
Anak Agung Bagus Amlayasa, Luh Kade Datrini Bambang Juanda, Lukytawati Anggraeni, Puri	2022	2x2 factorial designs, involving two variables: knowledge of recurring amnesties and tax sanctions Experimental study uses Factorial Randomized Block Design (RAKF) with five factors	compliant. Tax sanctions also plate significant effect to the compliance level. These two joint variables affect tax compliance (Riasning et al., 2021) Wealthier taxpayer tends to not comply, tax penalties along with higher audit probabilities have significant impact of compliance. Tax Amnesty could reduce tax
Anak Agung Bagus Amlayasa,	2022	2x2 factorial designs, involving two variables: knowledge of recurring amnesties and tax sanctions Experimental study uses Factorial Randomized Block Design (RAKF) with five factors incorporating replication	compliant. Tax sanctions also plate significant effect to the compliance level. These two joint variables affect tax compliance (Riasning et al., 2021) Wealthier taxpayer tends to not comply, tax penalties along with higher auditorial probabilities have significant impact of compliance. Tax Amnesty could reduce tax compliance, especially if it is repeated in the
Anak Agung Bagus Amlayasa, Luh Kade Datrini Bambang Juanda, Lukytawati Anggraeni, Puri Mahestyanti,	2022	2x2 factorial designs, involving two variables: knowledge of recurring amnesties and tax sanctions Experimental study uses Factorial Randomized Block Design (RAKF) with five factors incorporating replication components: Wealth,	compliant. Tax sanctions also plate significant effect to the compliance lever. These two joint variables affect tax compliance (Riasning et al., 2021) Wealthier taxpayer tends to not comply, tax penalties along with higher auditorial probabilities have significant impact of compliance. Tax Amnesty could reduce tax compliance, especially if it is repeated in the

Source: Author

2. Tax Amnesties in Indonesia

2.1. Tax Amnesty 1964

Indonesia government first introduced tax amnesty back in 1964, during President Soekarno's government. According to Presidential Decree No. 5 Year 1966 concerning Tax Amnesty Regulation, the background of this policy included the following:

- 1) tax regime during this period was viewed too burdensome and cumbersome for the taxpayers, which motivated them to avoid tax obligations;
- 2) tax authority did not have sufficient capacity to collect taxes and enforce the law simultaneously in order to curb tax avoidance and evasion.

Before implementing amnesty, Indonesian Government had already released some tax relaxation policies by issuing Presidential Instructions No. Instr. 2/KOTOE Year 1962 and No. Instr. 6/KOTOE Year 1962. The policy is somewhat similar to tax amnesty which, in brief, provided that any income invested or distributed to productive business activities would be free from legal prosecution or tax audits. However, these policies were less effective and were followed by the amnesty program(Iatmiko, 2022). There is no detailed information regarding the effective date of this amnesty implementation. However, initially the programme was offered until 16 August 1965 and then extended until 30 November 1965 (Setiyono, 2018)

Surprisingly, According to Law No. 12 Year 1966 concerning Determination of The Master Budget and Supplements and Amendments of State Budget of 1965, this amnesty was reported successfully collected more than 200% from the target revenue. The target was set at an amount of Rp50.000.000.000,00 with an estimated unreported income from shadow economy of around Rp500.000.000.000,00. Meanwhile, the realised amnesty revenue was reported at Rp121.562. 638.000,00 with estimated unreported income from shadow economy ranging from Rp1.200.000.000.000,00 to Rp1.600.000.000.000,00.

From this experience, it can be concluded that the first amnesty boosted short-term revenue, meanwhile there is no further information or data related to post-amnesty revenue or tax compliance.

2.2. Tax Amnesty 1984

The second amnesty was held in 1984 during President Soeharto's presidency and marked the first Indonesian tax reform, which involved a shift from an official assessment to a self-assessment system. This amnesty was based on Presidential Decree No. 26 of 1984 concerning Tax Amnesty and was initiated on April 18, 1984, less than four months after the implementation of new tax laws as part of the tax reform.

In the 1980s, revenue from oil resources served as the backbone of the state budget. However, after the decline in oil prices starting from 1982, the government realised that oil revenue alone was no longer sufficient to sustain the state's finances. This condition prompted the optimization of tax revenue as the new main source of state income. Tax Amnesty 1984 along with tax reform was a part of government's effort to improve tax revenue.

According to the decree, the main objective of the policy was to enhance the participation of society in the country's financing and development through a new tax system based on the integrity and transparency of taxpayers. Consequently, the government expected that the amnesty would improve the long-term compliance of taxpayers.

There is not much information or data available regarding this amnesty; however, some studies suggest that it was not successful in the short term, despite lasting for more than one year and ending on June 30, 1985 (Jatmiko, 2022). It only raised 67.8 billion rupiah, consisting of 45,6 billion rupiah from 182.114 individual taxpayers and 22,2 billion rupiah from 22.748 corporate taxpayers (Jatmiko, 2022).

Tax Amnesty (Sunset Policy) 2008

This policy cannot be fully compared to typical tax amnesty for two main reasons:

- 1) This policy is essentially an exemption of tax sanctions for unpaid or insufficient payment of income tax. Therefore, there is no specific law or regulation serving as a basis for amnesty. This means that taxpayers did not have a chance to pay a lower tax amount, as is the case with typical amnesty programs that replace the regular income tax rate with a lower ransom tariff.
- 2) There is no protection from tax legal prosecution after this policy has been terminated, although there is a guarantee that tax audits will not be performed.

However, the objectives of this policy are similar to tax amnesty in general. Hence, this paper considers the policy as "partial tax amnesty".

Initially, based on Article 37A of Law No. 28 Year 2007 concerning Third Amendment of Law No. 6 Year 1983 concerning General Provisions and Tax Procedures this programme was implemented from 1 January 2008 to 31 December 2008. Nevertheless, it was extended until 28 February 2009 (Government Regulation in Lieu of Law of The Republic of Indonesia, 2008).

Description **Sunset Policy Period Total** 1 Jan to 31 Dec. 1 Jan to 28 Feb 2009 2008 Additional taxpayers 3.545.076 2.090.052 5.635.128 Annual tax return 556.194 248.620 804.814 submission 1,9 7,46 Income tax revenue (in 5,56 trillion rupiah)

Table 2. Results of Sunset Policy

Source: DGT Annual Report 2009 (All Figures using Indonesian format)

The achievement of Sunset Policy in 2008 also supported the achievement of tax revenue collected by DGT in 2008. It was recorded that the tax revenue realisation is 571,10 trillion rupiah, surplus around 37 trillion rupiah from the target. Therefore, this policy is regarded as a successful effort to boost short-run revenue. However, after this triumphant, in 2009, the tax revenue experienced low growth which was merely 1,10% from 2008, with total amount 577,39 trillion rupiah Tax Amnesty 2016.

This fourth amnesty was another full tax amnesty program since 1984. Aside from government need to collect higher revenue, the main driver of this amnesty was an indication that there were around 11.000 trillion rupiah offshore assets belong to or related to Indonesian residents' or entities' (Cabinet Secretariat of The Republic of Indonesia, 2016). The government alleged that those assets have not been reported or even paid taxes and they have a plan to push this capital in order to spur Indonesian economy.

For this reason, the government set ransom tariffs for repatriated assets or funds same with domestic assets declaration. Meanwhile, declaration of offshore assets without repatriation are imposed with twofold higher tariffs compared with repatriated assets or funds and domestic assets. Nevertheless, there are special tariffs for taxpayers with maximum turnover 4,8 billion rupiah in one year (micro, small, and medium enterprises/MSME)

This programme was divided in three periods, which are from 1 July to 30 September 2016, 1 October to 31 December 2016, and lastly from 1 January to 31 March 2017. Each period has different ransom tariff. Ransom tariffs for repatriated assets or funds and declaration domestic assets are 2%, 3%, and 5% of the asset's amount respectively. Whereas, ransom tariffs for declaration of offshore assets are 4%, 6%, and 10% of the asset's amount respectively. Moreover, the tariff for MSME are 0,5% for taxpayers with the declared assets not more than 10 billion rupiah and 2% for taxpayers with the declared asset above 10 billion rupiah. The forgiven period of this amnesty was from 1985 to 2015, therefore it did not protect the years after 2015.

Table 3. Results of Tax Amnesty 2016

Types of	Participants	Ransom	Declared Assets (trillion Rp)		
Taxpayers		(trillion	Onshore	Repatriation	Offshore
		Rp)			
1. Individual	322.189	7,81	823,81	2,13	42,26
MSME					
2. Individual	413.904	91,36	2.250,84	119,01	961,61
Non-					
MSME					
3. Corporate	111.415	0,96	86,98	0,01	0,62
MSME					
4. Corporate	125.918	14,68	539,17	25,56	32,27
Non-					
MSME					
Total	973.426	114.54	3.700,80	146,70	1.036,76
	Grand Total			4.884,26	

Source: DGT Annual Report 2017 (All Figures using Indonesian format)

The achievement of this amnesty in short-run was remarkable, even it was claimed as tax amnesty with the highest revenue as well as declared assets (Primadhyta, 2016). However, the achievement could not help DGT to attain tax revenue target in 2016 as well as 2017.

Notwithstanding, in my view, the achievement of this amnesty also reveals the weaknesses of tax administration and leniency of tax law enforcement in Indonesia, hence there were massive tax avoidances and evasions that neither caught by the system nor received penalties.

2.4. Tax Amnesty (Voluntary Disclosure Program) 2022

Voluntary disclosure program (VDP) was implemented along with the enactment of new tax law regime, Harmonisation of Tax Regulations. This amnesty was launched just after the effects of pandemic COVID-19 had been declined. During pandemic, the government was in need of increase revenue to battle with the disease and its effect to the economy, in the meantime economic growth experienced contraction, even negative growth in 2020 (Badan Pusat Statistik, 2022). Therefore, it is understandable if Indonesian government wanted to raise extra fund to finance expenditures and to boost economy post-pandemic.

In theory, there is a different between VDP and tax amnesty which is typically VDP does not waive all tax liabilities in the past. Nevertheless, in case of Indonesia, the benefit received by the taxpayers are same with tax amnesty because VDP is basically the extension of tax amnesty in 2016 to 2017. Tax amnesty in 2016 was designed to forgive tax avoidances and or evasions that were committed from 1985 to 2015, whereas VDP in 2022 was mainly designed to forgive tax avoidances and or evasions that were committed from 2016 to 2020.

This programme was offered from 1 January 2022 to 30 June 2022 and it was classified in two policies, which were planned to target different participants. The first policy was offered only to ex-participants of tax amnesty 2016, hence this programme had captive participants. The limitation is explicable because it was designed to forgive tax burden from 1985 to 2015 in which the tax amnesty 2016 to 2017 applied. If this first policy offered to all taxpayers, it will even show weaknesses of tax law enforcement and hesitation of the government to take tougher action in tackling avoidance and evasion post-amnesty 2016. The second was offered only to individual taxpayers with forgiven period from 2016 to 2020, meaning that an individual taxpayer can participate in both policies. With these two designed policies, the tax authority wanted to distinguish this VDP to tax amnesty and refused this programme to be called tax amnesty second phase (Anam, 2022). Nevertheless, this study considers this programme is basically same with tax amnesty.

First policy's tariffs are offered with various schemes:

- 1) 6% of asset's amount for onshore declared assets and or repatriated assets so long as they are invested in renewable energy business and state's securities;
- 2) 8% of asset's amount for onshore declared assets and or repatriated assets; and
- 3) 11% of asset's amount for offshore declared assets.

On the other side, tariffs for second policy are quite high with the detail as follows:

- 1) 12% of asset's amount for onshore declared assets and or repatriated assets so long as they are invested in renewable energy business and state's securities;
- 2) 14% of asset's amount for onshore declared assets and or repatriated assets; and
- 3) 18% of asset's amount for offshore declared assets

This programme was also regarded as successful in terms of short-term objective which is to raise immediate fund with total ransom 61,01 trillion rupiah, 247.918 participants, and total declared asset 594,84 trillion rupiah. The detail result of this amnesty are as follows:

Table 4. Results of VDP 2022

Description	Policy I		Policy II
	Individual	Corporate	(only
			Individual)
Participants	78.389	4.067	225.603
Ransom (in trillion Rp)	31,38	1,53	28,10
Grand Total		61,01	
Declared Assets Onshore &	327,43	17,17	167,97
Repatriation (in trillion Rp)			
Invested Assets Onshore &	15,11	1,15	6,10
Repatriation (in trillion Rp)			
Declared Assets Offshore (in trillion	37,98	0,77	21,16
Rp)			
Total	380,52	19,09	195,23
Grand Total		594,84	

Source: Directorate General of Taxes (All Figures using Indonesian format)

3. Analysis of Compliance

3.1. Formal Compliance

In general, formal compliance is a compliance level related to non-payment obligation of taxpayers based on the tax law. This study discusses two key figures in formal compliance which are the number of taxpayers registered in the tax system and annual income tax return filing as main indicators of formal compliance, before and after amnesties. Although, from my perspective, formal compliance is not the essence of tax compliance but at the least it delivers complement insight of material compliance as the center of this analysis.

Table 5. Number of Taxpayers and Annual Tax Return Filing 2002 to 2021

Year	Registered Taxpayers (RT)	Effective Taxpayers (ET)	Non- Effective Taxpayers (NT)	Annual Tax Returns Filed (ATRF)	ΔET (%)	Δ ATRF (%)	ATRF ÷ RT (%)	ATRF ÷ ET (%)
2002	3.053.934	2.781.559	272.375	967.613	N/A	N/A	31,68	34,79
2003	3.457.734	3.145.745	311.989	1.070.192	13,09	10,60	30,95	34,02
2004	3.845.171	3.528.857	316.314	1.182.437	12,18	10,49	30,75	33,51
2005	4.206.762	3.883.378	323.384	1.240.571	10,05	4,92	29,49	31,95
2006	4.668.458	4.083.536	584.922	1.278.290	5,15	3,04	27,38	31,30
2007	6.694.236	4.478.032	2.216.204	1.113.694	9,66	-12,88	16,64	24,87
2008	10.682.099	6.776.241	3.905.858	2.097.849	51,32	88,37	19,64	30,96
2009	15.911.576	10.389.590	5.521.986	5.413.114	53,32	158,03	34,02	52,10
2010	19.112.590	14.101.933	5.010.657	8.202.309	35,73	51,53	42,92	58,16
2011	22.319.073	17.694.317	4.624.756	9.332.626	25,47	13,78	41,81	52,74

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2012	24.812.569	17.659.278	7.153.291	9.237.948	-0,20	-1,01	37,23	52,31
2013	28.002.205	17.731.736	10.270.469	9.967.904	0,41	7,90	35,60	56,22
2014	30.574.428	18.357.833	12.216.595	10.854.819	3,53	8,90	35,50	59,13
2015	33.313.655	18.159.840	15.153.815	10.975.909	-1,08	1,12	32,95	60,44
2016	36.398.089	20.165.718	16.232.371	12.256.401	11,05	11,67	33,67	60,78
2017	39.781.620	16.598.887	23.182.733	12.047.967	-17,69	-1,70	30,29	72,58
2018	42.536.341	17.653.046	24.883.295	12.551.444	6,35	4,18	29,51	71,10
2019	45.927.569	18.334.683	27.592.886	13.394.502	3,86	6,72	29,16	73,06
2020	49.845.432	19.006.794	30.838.638	14.755.255	3,67	10,16	29,60	77,63
2021	66.351.573	19.002.585	47.348.988	15.976.387	-0,02	8,28	24,08	84,07

Source: Annual Report Directorate General of Taxes 2007-2021 (All Figures using Indonesian format)

Table 6. Processed Data of Number of Taxpayers and Annual Tax Return Filing 2002 to 2021

Dagarintian	Т А		Т А	Tax Amnesty	
Description	Tax Amn	esty 2008	1 ax Amno	Tax Amnesty 2016	
-	2002-2007	2008-2021	2002-2015	2016-2021	2002-2021
\overline{x} RT	4.321.049	33.254.916	15.046.749	46.806.771	24.574.756
\overline{x} ET	3.650.185	16.545.177	10.197.991	18.460.286	12.676.679
\overline{x} NT	670.865	16.709.738	4.848.758	28.346.485	11.898.076
\overline{x} ATRF	1.142.133	10.504.602	5.209.663	13.496.993	7.695.862
$\overline{x} \Delta ET (\%)$	10,03	12,55	16,82	1,20	11,89
$\overline{x}\Delta$ ATRF (%)	3,23	26,28	26,52	6,55	20,22
xATRF/RT (%)	27,82	32,57	31,90	29,39	31,14
\overline{x} ATRF/ET (%)	31,74	61,52	43,75	73,20	52,59

Source: Author's calculation (All Figures using Indonesian format)

Table 5 depicts the number of registered taxpayers, effective taxpayers, non-effective taxpayers, growth of effective taxpayers, growth of annual tax returns filed, ratio of annual tax returns filed to registered taxpayers, and ratio of annual tax returns filed to effective taxpayers. Meanwhile, table 6 contains average values of each item in table 5. The calculations of average values are divided into two periods: before and after the implementation of the last three amnesties, except for tax amnesty 2022, which only contains data for the before period due to unavailable data.

Non-effective taxpayers are basically a group of taxpayers who are exempted from the obligation of filing annual income tax returns and are usually not monitored by the Directorate General of Taxes (DGT). This condition usually arises when taxpayers earn income below the taxable threshold, do not submit tax returns for two consecutive years, or cannot be located by the DGT. This group contradicts the increasing number of registered taxpayers, indicating that the actual increase in taxpayers cannot be accurately represented by that number. Instead, it is better reflected by the increase in effective taxpayers, who actively fulfill their tax obligations.

In terms of the number of registered taxpayers, the Indonesian government has succeeded in rapid multiplication over a span of twenty years. The highest increase was observed from 2020 to 2021, with an astonishing number of 16.50.141 in just one year. This additional number did not come from the implementation of the tax amnesty conducted in 2022, which suggests that the remarkable surge was likely triggered by government tax incentives during the pandemic, which "forced" people to register as taxpayers in order to benefit from the incentives.

On the other hand, there is a significant number of non-effective taxpayers each year. Despite the staggering increase in registered taxpayers, the number of non-effective taxpayers also rocketed in 2021, with an additional 16.510.350 taxpayers. This constant increase has led to an alarming number of non-effective taxpayers, reaching 47.348.988 in 2021. This group of taxpayers does not contribute to formal and material tax compliance. As a result, there has been negligible growth in the number of effective taxpayers between 2011 and 2021, with a notable increase occurring only in 2016 when the tax amnesty was implemented.

Unlike the number of registered taxpayer as well as non-effective taxpayers, the number of effective taxpayers relatively fluctuated, especially since 2011. The ups and downs of effective taxpayers are relatively small, except in 2016, when significant increase of 2.005.878 taxpayers was observed compared to 2015. The highest number of effective taxpayers was also recorded in 2016, reaching 20.165.718 but it collapsed to 16.598.887 taxpayers in 2017, representing a decrease of around 17,69% from 2016.

According to table 6, it is perceived at a glance that three tax amnesties improved the quantity of registered and effective taxpayers based on the average numbers, before and after the programmes took place. Although, as aforementioned, the average number of non-effective tax was also increased. However, the average number of non-effective taxpayers also increased. Upon examining the detailed figures for each year, it can be argued that the only amnesty that significantly contributed to the increase in registered and effective taxpayers was the tax amnesty in 2008. The additional taxpayers in other years were not affected by the amnesties but by other uninvestigated variables, as demonstrated by the highest increase in 2021 as discussed earlier. This view is supported by the fact that just after the implementation of the tax amnesty in 2016, the number of effective taxpayers.

From the perspective of effective taxpayers increase, it can be inferred that the last three amnesties do not contribute significantly to the increase. Only the amnesty in 2008 has quite significant impact to the increase along with other uninvestigated variables.

Overall, the filing of annual tax returns has shown steady growth, although there have been some anomalies. The tax authority experienced three periods of negative growth in the quantity of annual tax returns filed: -12,88% in 2007, -1,01% in 2012, and -1,70% in 2017. On the other hand, there were three remarkable periods of growth: 158,03% in 2009, 88,37% in 2008, and 51,53% in 2010. Considering the successful implementation of the tax amnesty in 2008, it is plausible to attribute these successes to the effect of the tax amnesty or sunset policy. However, this finding contradicts the previous fact that during the amnesty, there was a slight decline in the quantity of annual tax returns filed in 2017. This suggests that tax amnesty may be harmful to the level of compliance, especially if there is an expectation of repeated tax amnesty.

Table 6 also shows that, based on the average number of growths in annual tax returns filed and the ratio of annual tax returns filed to registered taxpayers, the tax amnesty in 2008 can be viewed as successful in improving formal compliance. After the tax amnesty in 2008, the average increase in effective taxpayers and annual tax returns filed significantly improved, from 10.03% and 3.23% to 12.55% and 26.28%, respectively.

On the contrary, when the tax amnesty was repeated in 2016 to 2017, it had a negative impact on formal compliance. This is evident from the sharp decline in the average percentage increase of effective taxpayers and annual tax returns filed after the tax amnesty in 2016 to 2017, from 16,82% and 26,52% to only 1,20% and 6,55%, respectively. Moreover, the average percentage increase in annual tax returns filed after the tax amnesty in 2016 was even lower than the average before the tax amnesty in 2022.

3.2. Material Compliance

3.2.1. Descriptive Analysis

Material compliance refers to a level compliance relating to payment of tax liabilities. From my perspective, material compliance is the essence of tax compliance because it is the most burdensome obligation for taxpayers and the ultimate goal of tax imposition. Tax payment can be particularly burdensome for taxpayers as it requires them to sacrifice a portion of their income or assets to fulfil this obligation. If taxpayers have already calculated their tax liabilities based on the law, there is little reason for them to ignore their formal compliance obligation.

Table 7. Tax Revenue and Income Tax Revenue 2002 to 2022 (in Billion Rupiah)

Year	Income Tax	Income Tax Revenue -	ΔITR	ΔITR-	ITR ÷ ET	ΔITR÷
	Revenue (ITR)	Tax Amnesty (ITR-	(%)	TA		\mathbf{ET}
		TA)		(%)		(%)
2002	101.873,50	101.873,50	N/A	N/A	0,0366246	N/A
2003	115.015,60	115.015,60	12,90	12,90	0,0365623	-0,17
2004	134.903,80	134.903,80	17,29	17,29	0,0382288	4,56
2005	175.379,70	175.379,70	30,00	30,00	0,0451616	18,14
2006	208.833,99	208.833,99	19,08	19,08	0,0511405	13,24
2007	238.739,97	238.739,97	14,32	14,32	0,0533136	4,25
2008	327.498,00	321.938,00	37,18	34,85	0,0483303	-9,35
2009	317.615,00	315.715,00	-3,02	-1,93	0,0305705	-36,75
2010	357.045,00	357.045,00	12,41	13,09	0,0253189	-17,18
2011	431.122,00	431.122,00	20,75	20,75	0,0243650	-3,77
2012	465.069,60	465.069,60	7,87	7,87	0,0263357	8,09
2013	506.442,80	506.442,80	8,90	8,90	0,0285614	8,45
2014	546.180,90	546.180,90	7,85	7,85	0,0297519	4,17
2015	602.308,13	602.308,13	10,28	10,28	0,0331670	11,48
2016	666.212,40	562.555,04	10,61	-6,60	0,0330369	-0,39
2017	646.793,50	635.768,32	-2,91	13,01	0,0389661	17,95
2018	749.977,00	749.977,00	15,95	17,96	0,0424843	9,03

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2019	772.265,70	772.265,70	2,97	2,97	0,0421205	-0,86
2020	594.033,33	594.033,33	-23,08	-23,08	0,0312537	-25,80
2021	696.676,60	696.676,60	17,28	17,28	0,0366622	17,31
2022	895.101,00	833.861,93	28,48	19,69	N/A	N/A

Source: Annual Report Directorate General of Taxes 2007-2021 & Central Bureau of Statistics (All Figures using Indonesian format)

Table 8. Processed Data of Tax Revenue and Income Tax Revenue 2002 - 2022

Description	Tax Amn	Amnesty 2008 Tax Amnesty 2016		Tax Amnesty 2022		
	2002-2007	2008-2022	2002-2015	2016-2022	2002-2021	2022
\overline{x} ITR	162.457,76	571.622,73	323.430,57	717.294,22	432.699,33	895.101,00
\overline{x} ITR-TA	162.457,76	559.397,29	322.897,71	692.162,56	426.592,20	833.861,93
x Δ ITR (%)	18,72	10,10	15,06	7,04	11,40	28,48
\overline{x} ITR ÷ ET	0,0435052	0,0313950	0,0362451	0,0320748	0,0365978	N/A
$\overline{x} \Delta ITR \div ET$	8,00	-7,84	0,40	-11,82	1,18	N/A

Source: Author's calculation (All Figures using Indonesian format)

I distinguished the term of income tax revenue into two terms which are income tax revenue with tax amnesty (ITR) and income tax revenue without tax amnesty (ITR-TA). The reason is to compare the results based on both concepts in order to conclude real impact of the amnesties to the revenue. Besides, tax amnesty revenue in Indonesia is considered as part of income tax revenue in the respective year. Therefore, Table 7 shows amount of income tax revenue and income tax revenue without amnesty revenue as a comparison. Table 7 also contains income tax revenue per effective taxpayers and growth of the revenues. Whereas, Table 8 depicts the average values of each component in table 7 pre and post amnesty.

Table 7 shows that there are three periods experienced negative growth of ITR which are -3,02% in 2009, -2,91% in 2017, and -23,08% in 2020. Meanwhile, the negative growth of ITR-TA was experienced in 2009, 2016, and 2020 account for -1,93%, -6,60%, and -23,08% respectively. Surprisingly, 2009 and 2017 are the years when tax amnesties were being implemented. This fact aligns with the findings of Alm and Beck (1993) who noted that a decline in compliance can occur immediately after the amnesty takes place or in subsequent years. Meanwhile, decline in 2020 happened due to Covid-19 pandemic.

The highest increase of ITR as well as ITR-TA, in terms of amount occurred in 2022, reaching almost 200 trillion rupiah. However, this remarkable increase did not come only from the amnesty but also from the soaring prices of some commodities and the implementation of other policies (Ministry of Finance, 2022). Although, in terms of growth percentage, the highest growth occurred in 2008 when the third amnesty took place.

Although the trend of ITR is upward, when we divide the revenue by the number of effective taxpayers as a rough illustration of income tax paid by each taxpayer, the results fluctuate significantly each year. Some studies have found that tax amnesties adversely affect tax compliance levels in the future, and this study confirms those findings (Alm et al., 1990) (Alm & Beck, 1993) (Sanchez Villalba, 2017). According to Table 8, the average income tax paid by each taxpayer

before tax amnesties in both 2008 and 2016 is higher than after amnesties. The average growth of income tax per taxpayer also shows a similar trend, with higher growth rates observed before amnesties compared to after amnesties. In fact, the average growth rates after amnesties in 2008 and 2016 are recorded as negative.

Overall, income tax revenue with amnesty (ITR) and income tax revenue without amnesty (ITR-TA) has shown that tax amnesties indeed contribute in short-term run revenue. However, the negative impact of tax amnesties on the compliance level has been proved immediately after the programme took place. This fact is based on the amount of ITR and ITR-TA in 2009, 2016, 2017, and 2020. The negative impact is also suspected to exist long after the amnesty. One of the pieces of evidence is that when the amnesty was repeated in 2022, participants still showed interest, and the amount collected through the program was still significant. In an ideal condition, when most taxpayers have already complied, the amnesty would not collect a huge amount of revenue because taxpayers would not be interested. Furthermore, the amount of income tax revenue per effective taxpayer each year also supports that assumption, because until 2022, the numbers are very fluctuating and the highest amount was recorded in 2007 at 0,0533136 billion rupiah and followed in 2006 at 0,0511405 billion rupiah.

3.2.2. Projection Result

In this study, the projection results are compared between income tax revenue with (ITR) and without amnesties revenue (ITR-TA) in order to draw conclusions regarding the effect of amnesties on material compliance. The first step involves determining whether the data is stationary and, if not, determining the order of differencing.

From the graph plot, it is obvious that the data is not stationary and it is confirmed with the same results of Augmented Dickey-Fuller (ADF) Test of both data as follows:

Description	Type 1: no drift no tre	Type 2: with drift no tre	Type 3: with drift and trend
ITR	lag ADF p.value	lag ADF p.value	lag ADF p.value
	[1,] 0 2.12 0.989	[1,] 0 -0.142 0.931	[1,] 0 -3.354 0.0841
	[2,] 1 1.87 0.981	[2,] 1 -0.258 0.915	[2,] 1 -4.249 0.0146
	[3,] 2 2.97 0.990	[3,] 2 -1.117 0.642	[3,] 2 -0.621 0.9652
ITR-TA	lag ADF p.value	lag ADF p.value	lag ADF p.value
	[1,] 0 -0.2756 0.556	[1,] 0 -3.55 0.0171	[1,] 0 -3.49 0.0653
	[2,] 1 -0.0573 0.619	[2,] 1 -3.37 0.0234	[2,] 1 -3.22 0.1080
	[3,] 2 0.2630 0.711	[3,] 2 -2.45 0.1682	[3,] 2 -2.27 0.4511

Table 9. ADF Test of ITR and ITR-TA

Source: Rstudio calculation

From the table, the results cannot reject null hypothesis that the data is non-stationary because pvalue greater than 0.05. Therefore, the data should be differenced to make it stationary.

To determine differencing number, again the ADF Test is applied in RStudio and the results are the second order differencing for income tax revenue data (ITR) and the first order for income tax revenue without amnesties revenues (ITR-TA).

Table 10. ADF Test of ITR and ITR-TA after differencing

	Table 10. Table Test of TIR and TIR 171 after differencing					
Description	Type 1: no drift no tre	Type 2: with drift no tre	Type 3: with drift and			
	nd	nd	trend			
ITR (2 nd	lag ADF p.value	lag ADF p.value	lag ADF p.value			
diff)	[1,] 0 -2.54 0.014	[1,] 0 -2.40 0.1860	[1,] 0 -2.63 0.324			
•	[2,] 1 -4.05 0.010	[2,] 1 -3.55 0.0173	[2,] 1 -2.78 0.268			
	[3,] 2 -2.77 0.010	[3,] 2 -14.31 0.0100	[3,] 2 -9.93 0.010			
ITR-TA (1st	lag ADF p.value	lag ADF p.value	lag ADF p.value			
diff)	[1,] 0 -5.78 0.01	[1,] 0 -5.66 0.0100	[1,] 0 -5.57 0.010			
	[2,] 1 -5.21 0.01	[2,] 1 -5.13 0.0100	[2,] 1 -5.03 0.010			
	[3,] 2 -3.13 0.01	[3,] 2 -3.05 0.0455	[3,] 2 -2.95 0.204			

Source: Rstudio calculation

After testing and determining the ARIMA model based on the differencing results, the best model for ITR is (0,2,1) and for ITR-TA is (2,1,0). The results of standard normal distribution test (z-test), Ljung-Box Test, and time series diagnostics of the residuals for both models are as follows:

Table 11. Z-Test of ARIMA Models

Description	Results of Z-Test Coefficients					
ARIMA (0,2,1) for ITR	Estimate Std. Error z value Pr(> z)					
	ma1 -0.99999 0.14761 -6.7744 1.249e-11 ***					
	Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					
ARIMA (2,1,0) for ITR-	Estimate Std. Error z value $Pr(> z)$					
TA	ar1 -0.41619 0.19978 -2.0832 0.03723 *					
	ar2 -0.41275 0.19689 -2.0963 0.03606 *					
	Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' '1					

Source: Rstudio calculation

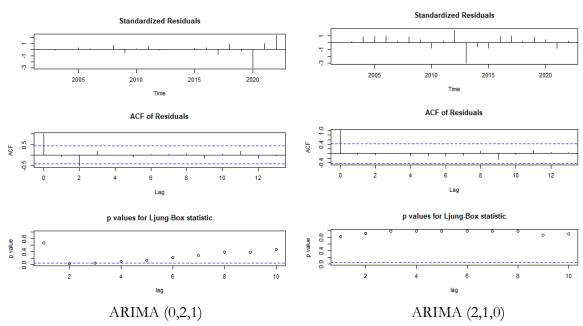
From the results, it is evident that the coefficient of ma1, with an estimated value of -1.00000 in ARIMA (0,2,1), is statistically significant at a significance level of 0.05. Therefore, there is evidence to reject the null hypothesis. Similarly, in ARIMA (2,1,0), the coefficient of ar1 and ar2 with estimated values of -0.41619 and -0.41275, presents a strong argument to reject the null hypothesis.

Table 12. Ljung-Box Test of ARIMA Models

Description	Results			
ARIMA (0,2,1) for ITR	X-squared = 8.4672, df = 5, p-value = 0.1323			
ARIMA (2,1,0) for ITR-TA	X-squared = 0.66901, df = 5, p-value = 0.9846			

Source: Rstudio calculation

Figure 1. TSDIAG Results



Source: Rstudio

From the results of time series diagnostics and Ljung-Box Test for both models, it is clear that the models can be used to generate projection or prediction values. The p-value of the model which are 0.1323 for ARIMA (0,2,1) and 0.9846 for ARIMA (2,1,0) suggest that there is no strong evidence to reject the null hypothesis, indicating that the model's fit to the data is reasonable. Moreover, the residual correlogram also shows that the model fit to be applied. The Final step is to predict the values of ITR as well as ITR-TA for the next 20 years (2023-2042).

Table 13. Prediction Values of ITR and ITR-TA 2023 – 2042 (in Billion Rupiah)

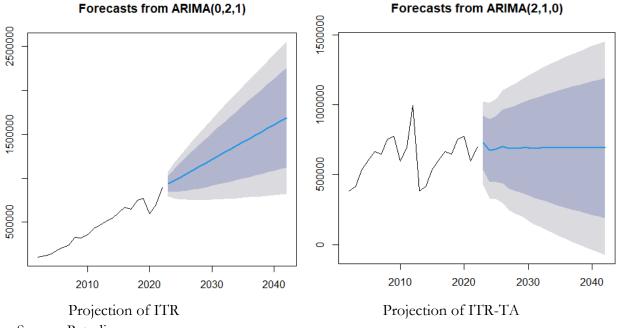
			\	1 /		
Year		ITR			ITR-TA	
	Pred	Lo 95	Hi 95	Pred	Lo 95	Hi 95
2023	934.762	794.517	1.075.008	727.540	430.513	1.024.566
2024	974.424	771.419	1.177.428	672.626	328.686	1.016.567
2025	1.014.085	759.869	1.268.302	682.676	323.856	1.041.496
2026	1.053.747	753.889	1.353.604	701.159	298.416	1.103.902
2027	1.093.408	751.244	1.435.572	689.319	248.710	1.129.928
2028	1.133.069	750.825	1.515.314	686.618	222.082	1.151.153
2029	1.172.731	751.994	1.593.467	692.629	200.649	1.184.608
2030	1.212.392	754.352	1.670.432	691.242	171.092	1.211.391
2031	1.252.053	757.630	1.746.477	689.338	145.172	1.233.504
2032	1.291.715	761.637	1.821.793	690.703	123.278	1.258.128
2033	1.331.376	766.236	1.896.517	690.921	100.239	1.281.603
2034	1.371.038	771.323	1.970.752	690.267	77.678	1.302.855
2035	1.410.699	776.818	2.044.580	690.449	56.874	1.324.024
2036	1.450.360	782.658	2.118.062	690.643	36.509	1.344.777

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2037	1.490.022	788.794	2.191.249	690.487	16.457	1.364.518
2038	1.529.683	795.185	2.264.181	690.472	-2.803	1.383.747
2039	1.569.345	801.798	2.336.891	690.543	-21.504	1.402.589
2040	1.609.006	808.606	2.409.406	690.519	-39.829	1.420.868
2041	1.648.667	815.584	2.481.750	690.500	-57.679	1.438.679
2042	1.688.329	822.715	2.553.942	690.518	-75.082	1.456.117

Source: Rstudio

Figure 2. Projection Graph



Source: Rstudio

Based on the information presented in Table 13 and Figure 2, we can conclude that the ITR-TA for the next twenty years is expected to level off, while the ITR is projected to increase. These results suggest that tax amnesties may not play a significant role in the future compliance and even might be harmful for future voluntary compliance of taxpayers, these findings are consistent with previous research conducted by Alm and Beck (1993) as well as Villalba (2017). They also align with the earlier discussion in the descriptive analysis, which indicated a downward trend in the average growth of income tax per taxpayer following the tax amnesties in 2008 and 2016.

Moreover, the increases of ITR in the subsequent years after amnesties are likely influenced by other variables such as economic growth, commodities prices, or other policies as discussed earlier. However, it is still possible that amnesties could have a more positive impact on compliance if the government demonstrates that the amnesty will not be repeated in the near future, the tax administration effectively detects tax avoidance, and stricter and consistent punishment for such avoidance is applied.

CONCLUSION

Based on the Indonesian experience, tax amnesty has proven to be an effective tool in generating immediate revenue needed by the government. Out of the five amnesties implemented, almost all of them are considered successful from a short-run perspective. The only exception is the amnesty in 1984, which was not as effective as other amnesties in collecting the targeted additional revenue, although it still managed to raise some additional revenue for the government.

Nevertheless, from perspective of improving tax compliance in medium to long-term, tax amnesties may have an adverse impact on this objective. Based on the discussion, both in terms of formal compliance and material compliance, tax amnesties are generally considered to make a minimal contribution to the overall level of compliance. In fact, they are often seen as playing a significant role in reducing voluntary compliance among taxpayers. The projection results of both ITR and ITR-TA support this argument. The projection of future ITR-TA, which represents the pure amount of income tax revenue, indicates that tax amnesties could be detrimental to the future growth of income tax revenue by causing it to level off.

These findings are not surprising, as they align with previous research findings. Furthermore, the results indicate a consistent pattern in taxpayers' behaviour towards tax amnesty. They are more likely to comply when they do not expect a future amnesty to be repeated. In some cases, taxpayers may plan or engage in avoidance during the amnesty period, with the expectation of avoiding detection and punishment until the next amnesty. This observation is supported by the fact that in 2009 and 2016, the years when tax amnesties took place, the revenue experienced negative growth.

If the government decides to implement another amnesty in the future, it is crucial for them to carefully consider and mitigate the potential impact or risks to the level of tax compliance. They need to conduct a cost-benefit evaluation of the amnesty, weighing the advantages of the immediate "fresh money" obtained through the amnesty against the potential decline in future tax compliance.

In short, the key question is whether the immediate financial gains from the amnesty outweigh the potential negative impact on future tax compliance. This evaluation should take into account various factors such as the magnitude of the fresh money obtained, the effectiveness of compliance measures, the long-term impact on voluntary compliance behavior, and the potential erosion of trust in the tax system.

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