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Corporate Tax Avoidance and Investment Efficiency: Evidence from the Enforcement of Tax Amnesty in Indonesia

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Abstract: This study examines the investment efficiency of firms engaging in tax avoidance in Indonesia. We test 2064 firm-year observations of Indonesian listed firms from 2010–2019 and document a positive relationship between tax avoidance and investment efficiency. This study also considers a unique setting of Indonesia as one of the few developing countries that implement tax amnesty. Thus, we test the variables in the period of prime tax amnesty implementation in Indonesia. We document significant results only in the firms that did not participate in tax amnesty during the implementation period. Nevertheless, the results are consistent in several alternative measurements and robust to the Propensity Score Matching regression to handle potential endogeneity. In addition, we discover that the investment efficiency of tax avoidance is salient in both firms prone to underinvestment and overinvestment. These findings extend the literature on tax avoidance and corporate investment. Based on the results, tax authorities should be stricter in handling tax avoidance practices because this practice has a cost-benefit trade-off that allows firms to obtain benefits at the expense of the state's income if not managed properly.

Keywords: tax avoidance; tax amnesty participation; investment efficiency; tax evasion

1. Introduction

Some firms engage in tax avoidance practices by undertaking tax planning strategies to report a lower taxable income (Frank et al. 2009; García-Meca et al. 2021). According to Balakrishnan et al. (2019), the practice of tax avoidance could increase the firm's financial complexity. Therefore, the management of firms with tax avoidance is used to handle the reporting complexity, and they are willing to engage in tax avoidance practices to obtain economic benefits for the firm (Armstrong et al. 2015). Based on prior research, tax avoidance can be indicated by effective tax rates, formulated by dividing the total tax expenses by pretax income (Chen et al. 2010). The firms with lower effective tax rates are associated with more tax avoidance compared to the higher ones, and vice versa. This can happen because firms with tax avoidance have differing levels of risk depending on the tax strategies they engage (Blouin 2014).

Practically, the practice of tax avoidance is one of many risky investment opportunities in which management can engage (Armstrong et al. 2015). The practice of tax avoidance allows a firm to have a greater probability of retaining greater funds for investment, because the cash flows from tax avoidance can be an essential source of capital (Edwards et al. 2016). Therefore, it could facilitate firms to manage the proceeds for making positive net present value projects. This argument is associated with the view that being tax avoidant could enhance the value of the firm if the expected marginal benefit exceeds the expected marginal cost (Desai and Dharmapala 2009).

In contrast, tax avoidance could facilitate managerial opportunism to channel the excess cash flow to make an inefficient investment decision (Khurana et al. 2018; Khurana

and Moser 2013). In addition, firms undertaking tax avoidance strategies create opaque corporate structures, hence causing difficulties for shareholders in assessing management performance (Desai and Dharmapala 2009).

In practice, the Indonesian government reported that Indonesian corporates and individuals have total assets of more than Rp 11,000 trillion located in foreign countries by taking advantage of the international tax loopholes (Nuritomo et al. 2020). However, in recent years, Indonesia has been one of the developing countries that implemented the tax amnesty policy in 2016–2017 to give a chance for firms that engage in tax avoidance to declare their assets. Hence, based on this setting, we examine the relationship between tax avoidance and investment efficiency, specifically during the prime implementation of tax amnesty in Indonesia.

This study differs from existing studies because we extend the research by considering the prime tax amnesty implementation period in Indonesia, which can be said to be successful for the first time in a while. The special setting of tax amnesty implementation in Indonesia is essential in this study because the tax amnesty program was intended to offer forgiveness for noncompliant taxpayers. The setting of tax amnesty attracts a lot of public attention, which can affect how companies with tax avoidance manage their investment funds to appeal to shareholders. This study matters because corporate taxes are also part of the investment decision in a firm, which could influence corporate decision-making (Graham 2003). It is also essential to know what factors can be related to its investment decision-making because investment activity is crucial for the firms' sustainability and is associated with future firm performance. Consequently, the prudent and optimal level of investment is important to enhancing the firm value (Bailing and Rui 2018; Lara et al. 2016). We also conducted this study due to the limited literature that examines the relationship between tax avoidance and investment efficiency in the tax amnesty period.

We hypothesize that tax avoidance is associated with higher investment efficiency since the practice of tax avoidance could generate more cash flow. This increased cash flow could be managed to engage in value-enhancing projects. Moreover, the management of firms that engage in tax avoidance is used to apply complex tax planning strategies, so the ability to make strategic decisions could help them to make more efficient investments. While in the setting of the tax amnesty period, we expect these firms that participate in tax amnesty to become less efficient in managing their investment decisions.

This study employs nonfinancial firms listed on the Indonesia Stock Exchange from 2010–2019. We test the results using the regression model with industry and year-fixed effects to control the variations in economic conditions across the research observation periods and differences in characteristics from each industry. The results suggest that firms engaging in tax avoidance are more likely to invest efficiently, and we document the insignificant result when these firms participate in tax amnesty during the implementation period. The results are consistent when using alternative investment efficiency measurements and are robust to the endogeneity test using the Propensity Score Matching method. In addition, we extend the analysis by separating the sample based on the tax amnesty occurrence period in Indonesia. We document that the positive result of tax avoidance and investment efficiency was driven because of the period and post-period of tax amnesty in Indonesia. These findings are interesting, and they imply that these periods could attract much public attention, and therefore firms engaging in tax avoidance will tend to doubt pursing inefficient investment projects. Furthermore, the positive relationship is also significant among the overinvestment and underinvestment sub-sample.

This study gives some contributions. First, theoretically, it could add to a growing body of research on the relationship between firms with a higher level of tax avoidance and their investment efficiency. Second, this study provides empirical evidence that a firm's cash tax savings from the tax avoidance practice are used efficiently, especially during the period and post-period of tax amnesty. This could happen because the period and post-period of tax amnesty might be driving more public attention. Third, this study shows that tax avoidance practice is not always managed negatively. It could create value in a certain

period, for example, during a period that attracts public interest. Although the practice of tax avoidance cannot be viewed as entirely negative, tax authorities in practice must still pay attention to the tax avoidance. They also may strengthen the tax enforcement regulations and thoroughly consider the implementation of tax amnesty to mitigate the managerial opportunism to engage in tax avoidance. Shareholders also should better consider the advantages and disadvantages of corporate tax avoidance and make the proper choice to enhance the firm value. Since the practice of tax avoidance has a cost-benefit trade-off, and it could facilitate managerial opportunism, these things might encourage them to obtain benefits at the expense of the state's tax income if not managed properly.

The remainder of this paper is organized as follows: Section 2 explains the literature review and hypothesis development. Section 3 provides the information of data used and the research methodology. Section 4 provides the result and discussion. Last, Section 5 delivers the conclusion, limitation, and suggestions for future research.

2. Literature Review

2.1. Prior Studies

2.1.1. Tax Avoidance

According to the prior literature, there is no universally accepted definition of tax avoidance construct (Deslandes et al. 2019; Hanlon and Heitzman 2010). Tax avoidance can be viewed as a continuum of tax planning strategies bounded by legal strategies, and the degree of tax avoidance depends on the eye of the beholders (Hanlon and Heitzman 2010). A prior study captures the degree of tax avoidance using current effective tax rates to capture the current period of the firm tax burden (Lennox et al. 2013). The practice of tax avoidance would cause an increase in the availability of cash flow, which can directly or indirectly benefit shareholders and managers (Hasan et al. 2021).

Based on the traditional view, rational managers would engage in tax avoidance practices if the marginal benefits exceed the marginal cost (Desai and Dharmapala 2009; Khurana and Moser 2013). Moreover, in the traditional view, tax avoidance practices allow the firms to retain greater resources, which can be utilized to increase shareholder value (Graham and Tucker 2006; Wilson 2009). This traditional economic theory suggests that the practice of tax avoidance can be value-enhancing because it transfers wealth from the state to the firm, which can be reinvested or returned to shareholders (Hasan et al. 2021).

2.1.2. Investment Efficiency

Investment efficiency is explained when there is no investment distortion (Huang 2020). We consider the value of an abnormal investment by using the deviation value of the firm's investment level from the expected investment level (Huang 2020). In this study, we identify firms that are more likely to deviate from the expected investment levels to see the closeness to the optimal level of investment (Boubaker et al. 2018; Liu and Tian 2019). Investment efficiency is crucial for firms because investment in good capital projects carries additional value, leading to sustainable profitability and growth (Naeem and Li 2019). Thus, the sustainability of a firm depends on its investment efficiency.

2.1.3. Overinvestment and Underinvestment

Overinvestment can happen because managers tend to waste funds on unprofitable projects (Naeem and Li 2019). Overinvestment can decrease firm value and impede investment efficiency due to wasting the firm's resources on the valueless project. In addition, agency issues such as empire building, overconfidence, career motives, and short-termism can cause an overinvestment in the firms facing agency problems (Malmendier and Tate 2005). Firms with positive residuals are considered overinvestment firms, indicating they are more likely to overinvest than all other firms in the same industry in a given year (Boubaker et al. 2018). In comparison, underinvestment can occur when managers decide to pursue quiet-life incentives. Firms with negative residual values are more likely to underinvest compared to all other firms in the same industry in a given year (Boubaker et al. 2018).

2.1.4. Tax Amnesty

Tax amnesty is a program to collect overdue taxes from new unknown noncompliant taxpayers (Shevlin et al. 2017). This program offers an opportunity for noncompliant taxpayers to pay a defined amount (redemption fees) for obtaining "forgiveness" over their unpaid tax liabilities, which include interest and penalties (Hajawiyah et al. 2021). This program is often followed by threats of increased enforcement and high penalties to alleviate tax avoidance practices (Mikesell and Ross 2012). Increased tax enforcement could also encourage firms to invest efficiently by reducing excessive investment expenditures (Zhang et al. 2022). Practically, the main objectives of tax amnesty implementation are to generate short-term revenue gains for the government and provide a longer-term benefit by adding new taxpayers to the system and enlarging the tax base (Shevlin et al. 2017).

2.1.5. Tax Avoidance and Tax Amnesty in Indonesia

In Indonesia's setting, the ratio of tax revenue and gross domestic products is 12% and is classified as low compared to other developing countries, which have a tax ratio of 18% (Hajawiyah et al. 2021). This low level of tax revenue happened due to Indonesian taxpayers' practices of tax avoidance and tax evasion. To address this issue, Indonesia became one of a few developing countries to implement a tax amnesty since many taxpayers, including corporate taxpayers, placed many assets in tax haven countries.

The tax authority decided to implement a tax amnesty program to offer forgiveness to these noncompliant taxpayers, which should be imposed a penalty of 200% of the amount of unpaid income tax. However, in this program, they are required to pay a defined amount (redemption fees) to obtain forgiveness over their tax liabilities (interest and penalties) (Hajawiyah et al. 2021). This program was first-time successfully implemented in 2016 and 2017, and previously, Indonesia adopted a similar policy in 2008; however, it was considered unsuccessful. Nevertheless, the current tax amnesty implementation is said to be more effective than the prior policy (Sayidah and Assagaf 2019), as shown by the result of the wealth declaration amounting to 4884 trillion rupiahs.

2.2. Hypothesis Development

2.2.1. Tax Avoidance and Investment Efficiency

Principally, the practice of tax avoidance requires a set of tax planning strategies done by the firm's management to minimize the firm's taxable income (García-Meca et al. 2021). The firm's management is adept at utilizing the strategy of legitimate tax action to lower the tax burdens. In addition, management expertise accustomed to devising a strategy to engage in tax avoidance practice can influence them in managing and determining the efficiency of their firm's investment.

A prior study discovered that firms with a higher level of tax avoidance might acquire more funds from lowering their current reported taxable income (Edwards et al. 2016). This shows that tax avoidance practices can be used as an internal funding source for firms because tax expenditure is one of the firms' major expenditures. Hence, a practice of tax avoidance could benefit the firms.

As firms with high levels of tax avoidance are linked to increased cash flow (Bailing and Rui 2018), it is critical for firms to have strong managerial ability and good corporate governance in managing the excessed cash to ensure investment efficiency (Khurana et al. 2018). The management should consider the benefits and costs of tax avoidance. They might engage in tax planning at a lower level of tax avoidance to obtain more cash flow but with less accompanying risk (Armstrong et al. 2015). The prior study claimed that the tax-reducing strategy could be less likely to affect the firm's operation adversely.

Particularly, the proceeds generated from tax avoidance practices constitute a significant source of financing for the firm. This can happen if a firm seeks alternate funding sources besides debt and equity financing, which can be more costly or difficult, especially for firms with financial constraints (Edwards et al. 2016). Based on a traditional view, tax avoidance could indicate a value-maximizing activity for firms because this strategy

facilitates the firm to have a wealth-transferring from the government to shareholders, but under a condition where the expected marginal benefit surpasses the marginal cost (Desai and Dharmapala 2009; Khurana and Moser 2013). Moreover, in the case of loss firms, they also engage in tax avoidance practices to enhance their value (McGuire et al. 2012). Firms with a high level of tax avoidance also might engage in costly activities to conceal their action from government authorities (Desai et al. 2007). They would utilize the additional cash flow from their tax avoidance action to invest in projects that generate positive NPV (Balakrishnan et al. 2019; Khurana et al. 2018). Hence, if firms could efficiently manage the proceeds from tax avoidance practices and invest them in projects, value-enhancing could increase the investment efficiency. According to the prior explanation, we expect that tax avoidance action facilitates the firm to engage more investment efficiency, and we propose the hypothesis as follows:

H1: *Firms with a higher level of tax avoidance are positively associated with investment efficiency.*

2.2.2. Tax Avoidance and Investment Efficiency in the Setting of the Tax Amnesty Period

Tax amnesty is a state taxation program to forgive noncompliant taxpayers from some or all penalties and fees of their unpaid tax liabilities (Mikesell and Ross 2012). This program could potentially give a signal to the public regarding increased enforcement by the tax authority (Buckwalter et al. 2014). Prior research also suggests that tax amnesty programs could lead most firms to become more concerned with further detection, such as examining the financial reporting records by tax authorities (Buckwalter et al. 2014).

When firms with tax avoidance participate in tax amnesty, they declare their income and tend to be spared from future negative consequences (Bayer et al. 2015). When participating in tax amnesty, these firms are willing to pay a defined amount (redemption fees) to obtain forgiveness of their tax liabilities and penalties that should be charged to them (Mikesell and Ross 2012). They are required to admit and pay their unpaid tax liabilities without incurring all of the sanctions (Lerman 1986). As a result, cash reserves usually used for investment allocation would be used for tax payments on participation in the tax amnesty program. This tax amnesty period attracted much public attention. When firms participate in tax amnesty, they might be too focused on preparing to join the program and set aside investment opportunities. Based on the prior findings and argument, the proposed second hypothesis is as follows:

H2: *Firms with a higher level of tax avoidance participating in a tax amnesty program are negatively associated with investment efficiency.*

3. Research Methodology
3.1. Sample and Data Source

The sample consists of nonfinancial firms listed on the Indonesia Stock Exchange (IDX) from 2010–2019. We obtained data related to the measurement of tax avoidance from financial reports. Meanwhile, the financial data for investment efficiency and other control variables are downloaded from the OSIRIS database.

We applied the following sample selection criteria: First, we excluded firms with Standard Industrial Classification code 6000–6999, which consist of finance, insurance, and real estate firms, since the asset structure differs from other industries (Huang 2020). Second, we excluded all missing data and obtained the final sample of 2064 firm-year observations. We also winsorize our data at 1% and 99% to remove data outliers.

This study employed the Propensity Score Matching (PSM) for the robustness test to address possible endogeneity issues. In addition, several additional tests were also carried out to examine the relationship between firms that engage in tax avoidance and investment efficiency in the tax amnesty period and their participation in tax amnesty in Indonesia.

3.2. Variables Measurement

3.2.1. Measuring Tax Avoidance

We measure tax avoidance using the current effective tax rates. This measurement captures firms' tax burdens in the current period (Lennox et al. 2013). Since this measurement uses current tax expense, it could incorporate the effect of permanent differences and represent the tax credit reduced to the marginal tax rate (Hanlon and Heitzman 2010).

We calculate the current effective tax rate by dividing the value of current tax expense by pretax income (Tran and Zhu 2017). For ease of interpretation, we multiply the variable of this measurement by −1, thus the greater the ratio indicates a higher tax avoidance. This measurement is based on taxable profit (taxable income) and can depict the transaction related to the explicit tax burden.

3.2.2. Measuring Investment Efficiency

The dependent variable in this study is investment efficiency, indicating that firms pursue investment projects at optimal levels. Following prior studies, we use the abnormal investment to examine investment efficiency, which is identified as the deviation of actual and optimal firms' investment levels (Huang 2020). This study uses the investment efficiency model by Huang (2020), which uses net free cash flow, leverage, and firm size as the control variables, written as follows:

$$INVEST\ (CAPX, R\&D)_{i,t} = \beta_0 + \beta_1 MTB_{i,t-1} + \beta_2 SG_{i,t-1} + \beta_3 FCF_{i,t} + \beta_4 LEV_{i,t-1} + \beta_5 LOGSALE_{i,t-1} + \varepsilon_{i,t} \tag{1}$$

INVEST in the equation indicates a firm investment calculated as the total capital expenditure and *R&D* expenditures. This measurement considers if the value of *R&D* is missing; we assume that it has zero value because some firms do not disclose their *R&D* expenditures if they have immaterial value (Coles et al. 2006). The investment efficiency is captured using the residual value from the regression by industry and year effects with a minimun of ten observations per industries. We use the absolute value of residuals from the equation to measure differences between the actual and ideal investments, consistent with prior study (Chen et al. 2011). As the higher absolute value of the residual indicates a less efficient investment (Liu and Tian 2019), we multiplied the absolute value of residual with a negative so higher value would indicates higher investment efficiency.

3.2.3. Control Variables

Based on the prior literature, we incorporate several control variables for investment efficiency. First, we include corporate governance variables (Boubaker et al. 2018; Liu and Tian 2019), which consist of firm board size (*BSIZE*), risk management committee (*RMC*), audit committee (*AUCOM*), Big 4 audit firm (*BIG4*), and firm age (*AGE*). We also include three control variables that are commonly associated with firm investment behavior (Bae et al. 2017), which consist of return on equity (*ROE*), firm size (*FSIZE*), and debt to equity (*DEBT_EQ*). In addition, we also use tax amnesty participation (VARNAME) as our control variable and control for year and industry fixed effects. Details of variable operationalizations are provided in Appendix A.

3.3. Empirical Model

This study employed the following regression models to examine the relationship between tax avoidance with investment efficiency. To test the first and second hypotheses, we estimated Equations (2) and (3):

$$\begin{aligned} INVEFF_{i,t} = {} & \beta_0 + \beta_1 TAV_{i,t} + \beta_2 TAPAR_{i,t} + \beta_3 BSIZE_{i,t} + \beta_4 RMC_{i,t} + \beta_5 AUCOM_{i,t} + \beta_6 BIG4_{i,t} \\ & + \beta_7 AGE_{i,t} + \beta_8 ROE_{i,t} + \beta_9 FSIZE_{i,t} + \beta_{10} DEBT\_EQ_{i,t} + \theta_{1-n} YEAR \\ & + \delta_{1-n} INDUSTRY + \varepsilon_{i,t} \end{aligned} \tag{2}$$

$$INVEFF_{i,t} = \beta_0 + \beta_1 TAV_{i,t} + \beta_2 TAPAR_{i,t} + \beta_3 TAV{*}TAPAR_{i,t} + \beta_4 SIZE + \beta_5 RMC_{i,t} + \beta_6 AUCOM_{i,t}$$
$$+ \beta_7 BIG4_{i,t} + \beta_8 AGE_{i,t} + \beta_9 ROE_{i,t} + \beta_{10} FSIZE_{i,t} + \beta_{11} DEBT\_EQ_{i,t} + \theta_{1-n} YEAR \qquad (3)$$
$$+ \delta_{1-n} INDUSTRY + \varepsilon_{i,t}$$

4. Result and Discussion

4.1. Sample Distribution and Descriptive Statistics

Table 1 provides the sample distribution based on Standard Industry Classification (SIC) code. According to the table, 29.65% of the samples are from manufacturing industries with Standard Industrial Classification (SIC) code number 2, or we can state that most of the samples in this study are from manufacturing industries. Since we also want to examine the participation of tax amnesty programs in Indonesia, we also provide the sample distribution based on the period tax amnesty program shown in Panel B of Table 1. We can see from the sample that the number of samples in the pre-period of tax amnesty is 1236. The pre-period of the tax amnesty in this sample is ranged from 2010 to 2015. For the period of tax amnesty, which occurred in 2016 and 2017, the final sample of this period is 410, and for the post-period consists of 418 samples from 2018 and 2019.

Table 1. Sample Distribution.

Panel A: Sample Distribution Based on Industry Classification		
Industry Classification		
	N	**%**
(SIC 0) Agriculture, Forestry, Fisheries	87	4.22%
(SIC 1) Mining & Construction	318	15.41%
(SIC 2) Manufacturing	612	29.65%
(SIC 3) Manufacturing	346	16.76%
(SIC 4) Transportation, Communication, and Utilities	302	14.63%
(SIC 5) Wholesale and Retail Trade	229	11.09%
(SIC 7) Services Industries	160	7.75%
(SIC 8) Health, Legal, and Educational Services and Consulting	10	0.48%
TOTAL	**2064**	**100%**

Panel B: Tax Amnesty Sample Distribution Based on Industry Classification						
	Pre-Period of Tax Amnesty (2010–2015)		**Period of Tax Amnesty (2016 & 2017)**		**Post-Period of Tax Amnesty (2018 & 2019)**	
Industry Classification	**N**	**%**	**N**	**%**	**N**	**%**
(SIC 0) Agriculture, Forestry, Fisheries	57	4.61%	17	4.15%	13	3.11%
(SIC 1) Mining & Construction	185	14.97%	62	15.12%	71	16.99%
(SIC 2) Manufacturing	366	29.61%	127	30.98%	119	28.47%
(SIC 3) Manufacturing	210	16.99%	67	16.34%	69	16.51%
(SIC 4) Transportation, Communication, and Utilities	178	14.40%	62	15.12%	62	14.83%
(SIC 5) Wholesale and Retail Trade	141	11.41%	43	10.49%	45	10.77%
(SIC 7) Services Industries	99	8.01%	32	7.80%	29	6.94%
(SIC 8) Health, Legal, and Educational Services and Consulting	0	0	0	0	10	2.39%
TOTAL	1236	100%	410	100%	418	100%

In Table 2, we provide the descriptive statistics to show the data characteristics in this sample. The variable investment efficiency (*INVEFF*) is already in absolute value and multiplied by −1 to show that the higher the number indicates a higher investment efficiency. The mean value for investment efficiency is −0.143. While the variable tax avoidance (*TAV*) is also already multiplied by −1, thus the higher the ratio implies a higher tax avoidance level. Table 2 shows that the mean for tax avoidance level in this sample is −0.224, while the highest tax avoidance level in this sample is shown by the value in column minimum, with the current ratio of −0.694.

Table 2. Descriptive Statistics.

	Descriptive Statistics			
	Mean	**Median**	**Minimum**	**Maximum**
INVEFF	−0.143	−0.010	−2.988	−0.000
TAV	−0.224	−0.238	−0.694	0.000
TAPAR	0.487	0.000	0.000	1.000
BSIZE	8.781	8.000	4.000	19.000
RMC	0.181	0.000	0.000	1.000
AUCOM	2.791	3.000	0.000	6.000
BIG4	0.370	0.000	0.000	1.000
AGE	2.520	2.833	0.000	4.007
ROE	6.329	6.870	−108.970	89.890
FSIZE	23.010	22.078	17.413	31.971
DEBT_EQ	1.349	0.891	−11.469	18.282

4.2. Pearson Correlation

Table 3 provides the results of the Pearson Correlation test. The correlation between tax avoidance (*TAV*) and investment efficiency (*INVEFF*) is positive and significant at 1% level. The result documents that tax avoidance positively correlates to investment efficiency with coefficient value = 0.055 and t = 0.009. This result is consistent with the first hypothesis. The variable tax amnesty participation (*TAPAR*) also positively correlates with investment efficiency. This correlation is significant at 1% level with a coefficient value = 0.124, t = 0.000. Another variable having a significant negative correlation with investment efficiency is board size (*BSIZE*), with a coefficient value −0.066, and t = 0.000. Meanwhile, the variable of audit committee (*AUCOM*) has a significant positive correlation at a 1% level with a coefficient value = 0.079 and t = 0.000. The significant correlation among variables does not raise multicollinearity issues, since the variance inflation factors (VIFs) have an average of 2.56.

Table 3. Pearson Correlation.

		Panel A: From Variable *INVEFF* to Variable *AUCOM*					
		1	**2**	**3**	**4**	**5**	**6**
1	*INVEFF*	1.000					
2	*TAV*	0.055 ***	1.000				
		(0.009)					
3	*TAPAR*	0.124 ***	0.056 ***	1.000			
		(0.000)	(0.004)				
4	*BSIZE*	−0.066 ***	−0.058 ***	−0.154 ***	1.000		
		(0.000)	(0.004)	(0.000)			
5	*RMC*	0.013	−0.102 ***	−0.082 ***	0.222 ***	1.000	
		(0.459)	(0.000)	(0.000)	(0.000)		
6	*AUCOM*	0.079 ***	−0.018	−0.007	0.177 ***	0.180 ***	1.000
		(0.000)	(0.382)	(0.659)	(0.000)	(0.000)	

Table 3. *Cont.*

		Panel B: From Variable *BIG4* to Variable *DEBT_EQ*					
		6	**7**	**8**	**9**	**10**	**11**
7	*BIG4*	0.135 ***	1.000				
		(0.000)					
8	*AGE*	−0.022	0.092 ***	1.000			
		(0.261)	(0.000)				
9	*ROE*	0.015	0.171 ***	−0.019	1.000		
		(0.372)	(0.000)	(0.334)			
10	*FSIZE*	0.202 ***	0.106 ***	0.332 ***	−0.179 ***	1.000	
		(0.000)	(0.000)	(0.000)	(0.000)		
11	*DEBT_EQ*	−0.009	0.013	−0.012	−0.282 ***	0.071 ***	1.000
		(0.595)	(0.431)	(0.549)	(0.000)	(0.000)	

p-values in parentheses *** $p < 0.01$.

4.3. Regression Analysis

We test the first hypothesis by presenting the test without and with the independent variable, shown in the first and second columns of Table 4. The second column shows a positive relationship between tax avoidance and investment efficiency that is significant at level 1% with a *p*-value = 0.004. The result shows a coefficient value of 0.248 and t = 3.958. In addition, we discover that the variable of tax avoidance adds the adjusted R^2 by 0.3% from 0.394 to 0.397 if we compare the results in the first and second columns.

Table 4. Regression of Tax Avoidance with Investment Efficiency for the First Hypothesis.

	Control	**Baseline**
	INVEFF	
TAV		0.248 ***
		(3.958)
TAPAR	0.012	0.013
	(0.723)	(0.794)
BSIZE	0.006 *	0.007 **
	(1.925)	(2.010)
RMC	−0.012	−0.001
	(−0.323)	(−0.018)
AUCOM	0.002	0.003
	(0.155)	(0.201)
BIG4	−0.028	−0.018
	(−1.433)	(−0.898)
AGE	−0.016 **	−0.015 *
	(−1.977)	(−1.912)
ROE	−0.014 ***	−0.015 ***
	(−7.123)	(−7.238)
FSIZE	−0.010	−0.011
	(−1.291)	(−1.466)
DEBT_EQ	0.027 ***	0.029 ***
	(3.040)	(3.239)
Industry Fixed Effect	Included	Included
Year Fixed Effect	Included	Included
_cons	0.288 *	0.371 **
	(1.878)	(2.397)
r2	0.394	0.397
N	2064	2064

t statistics in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Based on the results, the first hypothesis of this study is supported. The result is in accordance with a prior study that firms with tax avoidance have a greater probability of

retaining greater funds for investment because the cash flows from tax avoidance action can be an essential source of capital for the firm (Edwards et al. 2016). Thus, it could facilitate them to harness the proceeds for making positive net present value projects. Since firms with tax avoidance are used to engage in complex tax planning strategies, this tax-related strategy is also considered part of investment decisions (Graham 2003). Thus, firms accustomed to carrying out complex tax strategies could strategically determine the amount of investment efficiently. We also argue that this result gives evidence that there is a trade-off cost and benefit for these firms that correspond to the traditional view of tax risk-return trade-off (Graham and Tucker 2006; Wilson 2009). This suggests that our result supports the traditional economic theory regarding the positive relationship between tax avoidance practice and investment efficiency.

From the continuous variable variable of tax avoidance (*TAV*), we created a dummy variable of tax avoidance (*D_TAV*) using the the median value of −0.2380475 as the cutoff point. We assigned value 1 for high tav avoidance firms if *TAV* is more than median, otherwise 0. This test is shown in Table 5, and the results are consistently significant at 1%. This test using an indicator variable shows a coefficient value = 0.065 and t = 3.236.

Table 5. Regression of Tax Avoidance (Using Indicator Variable) with Investment Efficiency for the First Hypothesis.

	Control	**Baseline**
	INVEFF	
D_TAV		0.065 ***
		(3.236)
TAPAR	0.012	0.010
	(0.723)	(0.599)
BSIZE	0.006 *	0.006 *
	(1.925)	(1.868)
RMC	−0.012	−0.004
	(−0.323)	(−0.107)
AUCOM	0.002	0.002
	(0.155)	(0.147)
BIG4	−0.028	−0.018
	(−1.433)	(−0.876)
AGE	−0.016 **	−0.016 **
	(−1.977)	(−2.052)
ROE	−0.014 ***	−0.014 ***
	(−7.123)	(−7.218)
FSIZE	−0.010	−0.011
	(−1.291)	(−1.430)
DEBT_EQ	0.027 ***	0.027 ***
	(3.040)	(3.084)
Industry Fixed Effect	Included	Included
Year Fixed Effect	Included	Included
_cons	0.288 *	0.276 *
	(1.878)	(1.807)
r2	0.394	0.397
N	2064	2064

t statistics in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Additionally, we want to extend the study by considering the tax amnesty implementation period in Indonesia. Specifically, in Indonesia, tax amnesty enforcement was implemented in 2016 and 2017. Thus, we managed to separate our sample into a pre-period year of tax amnesty implementation, which consists of 2010–2015; a period year of tax amnesty implementation in 2016 and 2017; and a post-period year of tax amnesty implementation using data from 2018 and 2019.

In Table 6, the first column presents that tax avoidance and investment efficiency in the pre-period of tax amnesty show no significant result. In contrast, we document significant results in the second and third columns. These results imply that the significant result of the first hypothesis is driven by the period of tax amnesty implementation and the post-period of tax amnesty implementation in Indonesia. Furthermore, we document that firms participating in tax amnesty (*TAPAR*) have significant investment efficiency only in the period year of tax amnesty implementation (2016–2017).

Table 6. Regression of Tax Avoidance with Investment Efficiency Based on Subsample Tax Amnesty Period for the Additional Analysis.

	Pre-Period Year of Tax Amnesty Implementation (2010–2015)	**Period Year of Tax Amnesty Implementation (2016 & 2017)**	**Post-Period Year of Tax Amnesty Implementation (2018 & 2019)**
	INVEFF		
TAV	0.147	0.268 *	0.147 **
	(1.547)	(1.955)	(2.436)
TAPAR	−0.012	0.059 **	0.016
	(−0.516)	(2.070)	(0.791)
BSIZE	0.013 ***	0.002	−0.009 *
	(2.798)	(0.392)	(−1.860)
RMC	−0.009	0.006	0.013
	(−0.160)	(0.095)	(0.269)
AUCOM	0.006	−0.029	0.027
	(0.344)	(−1.480)	(1.194)
BIG4	−0.105 ***	0.006	0.037
	(−3.499)	(0.173)	(1.206)
AGE	−0.022 *	−0.003	−0.016
	(−1.792)	(−0.188)	(−1.157)
ROE	−0.012 ***	−0.011 ***	−0.010 ***
	(−4.852)	(−3.434)	(−3.409)
FSIZE	−0.009	−0.005	−0.005
	(−0.767)	(−0.330)	(−0.491)
DEBT_EQ	0.003	0.032 **	0.028 **
	(0.194)	(2.106)	(2.257)
Industry Fixed Effect	Included	Included	Included
Year Fixed Effect	Included	Included	Included
_cons	0.319	0.245	0.176
	(1.373)	(0.907)	(0.835)
r2	0.395	0.405	0.341
N	1236	410	418

t statistics in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

However, each sample year for the period and post-period of tax amnesty implementation in this study are two years, therefore we also want to analyse the pre-period of tax amnesty using two years prior to the tax amnesty implementation to make the results more comparable. We re-examine the analyses, and the results are shown in the following Table 7. The results remain consistent like prior Table 6, which implies that the positive relationship between tax avoidance firms and investment efficiency is driven by the period and post-period of tax amnesty implementation in Indonesia.

Table 7. Regression of Tax Avoidance with Investment Efficiency Based on Sub-Sample Tax Amnesty Period for the Additional Analysis.

	Pre-Period Year of Tax Amnesty Implementation (2014–2015)	Period Year of Tax Amnesty Implementation (2016 & 2017)	Post-Period Year of Tax Amnesty Implementation (2018 & 2019)
	INVEFF		
TAV	0.064	0.268 *	0.147 **
	(0.619)	(1.955)	(2.436)
TAPAR	0.036	0.059 **	0.016
	(1.093)	(2.070)	(0.791)
BSIZE	0.013 *	0.002	−0.009 *
	(1.701)	(0.392)	(−1.860)
RMC	0.105	0.006	0.013
	(1.417)	(0.095)	(0.269)
AUCOM	−0.012	−0.029	0.027
	(−0.459)	(−1.480)	(1.194)
BIG4	−0.090 *	0.006	0.037
	(−1.921)	(0.173)	(1.206)
AGE	−0.032 **	−0.003	−0.016
	(−2.047)	(−0.188)	(−1.157)
ROE	−0.009 ***	−0.011 ***	−0.010 ***
	(−3.065)	(−3.434)	(−3.409)
FSIZE	−0.016	−0.005	−0.005
	(−0.809)	(−0.330)	(−0.491)
DEBT_EQ	0.018	0.032 **	0.028 **
	(1.219)	(2.106)	(2.257)
Industry Fixed Effect	Included	Included	Included
Year Fixed Effect	Included	Included	Included
_cons	0.357	0.245	0.176
	(0.926)	(0.907)	(0.835)
r2	0.362	0.405	0.341
N	403	410	418

t statistics in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Practically, the result shows a contrary finding from a prior study which stated that firms with a large available cash flow from tax avoidance tend to have inefficient investment because of overinvestment (Asiri et al. 2020). This shows that in Indonesia's setting, we discover that firms utilize the available amount of cash from tax avoidance to invest in value-enhancing projects efficiently. We assume this occurs because our additional findings, which show the significant result of the first hypothesis, are driven by the period of tax amnesty implementation and the post-period of tax amnesty implementation in Indonesia. The tax amnesty implementation in Indonesia can be said to be successful for the first time in a while. Previously, almost a similar policy had occurred in 2008 (Sayidah and Assagaf 2019). Thus, in a relatively long period, the implementation of the tax amnesty in Indonesia certainly attracted a lot of public attention. This period is usually associated with more scrutiny and stronger detection (Shevlin et al. 2017). Therefore, in this period, the firms already committed to tax avoidance try to manage the cash flow efficiently because it would attract a lot of public attention, and they doubt pursuing managerial opportunism. However, the positive relationship remains significant in the post-period year of tax amnesty implementation. This might occur because firms are aware of increased monitoring after a tax amnesty program (Buckwalter et al. 2014).

For the second hypothesis, we only test the data period of 2016 and 2017 since we want to examine the investment efficiency of firms that engage in tax avoidance and participate in tax amnesty in Indonesia. According to Table 8, we capture the insignificant results when we interact the variable of tax avoidance with tax amnesty participation (*TAV*TAPAR*).

However, we figured out that a significant result is only prominent in the firms with tax avoidance that did not participate in tax amnesty in the implementation period (*TAV*). The relationship between tax avoidance and investment efficiency in this period is positive and significant at 10%, with a *p*-value=0.097 and a coefficient value=0.375. This significant result may be driven by the tax amnesty implementation period attracting much public attention. They might be aware of increased monitoring after a tax amnesty program (Buckwalter et al. 2014). As a result, they become doubtful about pursuing managerial opportunism or taking inefficient investment projects.

Table 8. Regression of Firms with Tax Avoidance that Participate in Tax Amnesty with Investment Efficiency Based on the Sub-Sample Tax Amnesty Period for the Second Hypothesis.

	(1)
	INVEFF
*TAV*TAPAR*	−0.237
	(−0.981)
TAV	0.375 *
	(1.683)
TAPAR	0.007
	(0.144)
BSIZE	0.002
	(0.398)
RMC	0.004
	(0.066)
AUCOM	−0.033
	(−1.571)
BIG4	0.004
	(0.124)
AGE	−0.002
	(−0.119)
ROE	−0.011 ***
	(−3.459)
FSIZE	−0.004
	(−0.270)
DEBT_EQ	0.030 *
	(1.931)
Industry Fixed Effect	Included
Year Fixed Effect	Included
_cons	0.267
	(0.991)
r2	0.406
N	410

t statistics in parentheses. * $p < 0.1$, *** $p < 0.01$.

4.4. Robustness Test

This study may generate a potential endogeneity problem because corporate tax avoidance decisions and investment efficiency could be driven by managerial incentives (He et al. 2020). We test the robustness of the results by employing batteries of tests, namely the propensity score matching, the lag and lead variables, and alternative measurement of investment efficiency.

4.4.1. Propensity Score Matching

In the context of this study, the endogeneity problem may arise because firms with higher and lower tax avoidance differ along with observable characteristics. The choice to be tax avoidance is endogenous since it is decided by the firm's manager. We use a the Propensity Score Matching (PSM) approach to create matched samples based on tax avoidance to address the endogeneity issue of observed variables (Dhawan et al. 2020). We

also use this method to minimize biases due to functional form misspecification (Dhawan et al. 2020). The sample is divided into a treatment and control group based on the independent variable, tax avoidance. All the observable characteristics that consist of control variables and industry year fixed effects are used to assign the propensity score. The procedure compares the treatment group with the control group using the closest propensity score.

　　Using the matched-sample method, we obtain a final sample of 1532 for the first hypothesis and 294 for the second hypothesis. We still capture the consistent result like in the previous test for the first and second hypotheses shown in Table 9. According to this robustness test, the first hypothesis is significant at the level of 1% with a coefficient value = 0.175 and *p*-value = 0.008. While in the second hypothesis, the significant result is only in variable tax avoidance (*TAV*) that is significant at 10%. These results prove that our results remain consistent after using the PSM regression.

Table 9. Propensity Score Matching Test for the First and Second Hypothesis.

	(H1)	(H2)
	INVEFF	*INVEFF*
*TAV*TAPAR*		−0.532
		(−1.56)
TAV	0.175 ***	0.627 *
	(2.67)	(1.91)
TAPAR	−0.002	−0.020
	(−0.10)	(−0.35)
BSIZE	0.008 **	0.002
	(2.34)	(0.31)
RMC	0.054	0.065
	(1.45)	(0.99)
AUCOM	−0.009	−0.051 *
	(−0.59)	(−1.94)
BIG4	−0.060 ***	−0.017
	(−2.76)	(−0.44)
AGE	−0.011	0.003
	(−1.23)	(0.15)
ROE	−0.008 ***	−0.010 ***
	(−4.86)	(−2.89)
FSIZE	−0.010	0.006
	(−1.24)	(0.33)
DEBT_EQ	0.012	0.027
	(0.76)	(1.52)
Industry Fixed Effect	Included	Included
Year Fixed Effect	Included	Included
_cons	0.285 *	0.152
	(1.76)	(0.50)
r2	0.364	0.436
N	1532	294

t statistics in parentheses. * *p* < 0.1, ** *p* < 0.05, *** *p* < 0.01.

4.4.2. Lag and Lead Variables

　　We follow prior studies to address the causality issue that doubts the "true" independent and dependent variables of this study. We re-estimate the regression by using two additional variables originally generated from our independent and dependent variables. We conduct three additional tests to address this causality issue. First, we rerun the first equation of regression by replacing the independent variable with its lagged version (*LAG_TAV*). Second, we rerun the first equation regression by replacing the dependent variable with its lead version (*LEAD_INVEFF*), indicating the investment efficiency from the upcoming period. Third, we rerun the first equation regression by using the lead

version of the dependent variable (*LEAD_INVEFF*) and adding the current period of investment efficiency (*INVEFF*) as an additional control variable. We adopt this approach to address the potential problem of simultaneity and reverse causality (Gretz and Malshe 2019; Harymawan et al. 2021; Zahid et al. 2020). This method is also used to control the problem of serial and first-order autocorrelation in the model (Zahid et al. 2020). The results are shown in the following Table 10.

Table 10. Regression of Lag and Lead Variables.

	(1)	**(2)**	**(3)**
	INVEFF	***LEAD_INVEFF***	***LEAD_INVEFF***
LAG_TAV	0.131 *		
	(1.682)		
TAV		0.367 ***	0.230 **
		(3.107)	(2.399)
INVEFF			0.821 ***
			(8.061)
TAPAR	0.032 *	0.022	0.009
	(1.854)	(1.134)	(0.470)
BSIZE	0.002	0.004	−0.001
	(0.536)	(1.103)	(−0.393)
RMC	−0.003	−0.032	−0.026
	(−0.091)	(−0.458)	(−0.470)
AUCOM	0.008	0.049 *	0.051 **
	(0.455)	(1.918)	(2.341)
BIG4	−0.045 **	−0.027	0.020
	(−2.002)	(−0.979)	(0.828)
AGE	−0.016 *	−0.023 **	−0.013
	(−1.764)	(−2.264)	(−1.500)
ROE	−0.010 ***	−0.020 ***	−0.012 ***
	(−5.647)	(−5.448)	(−4.806)
FSIZE	0.001	−0.014	−0.010
	(0.119)	(−1.170)	(−0.962)
DEBT_EQ	−0.008	0.023	0.017
	(−0.622)	(1.531)	(0.990)
Industry Fixed Effect	Included	Included	Included
Year Fixed Effect	Included	Included	Included
_cons	0.018	0.391	0.235
	(0.103)	(1.564)	(1.041)
r2_a	0.364	0.307	0.485
N	1680	1901	1849

t statistics in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Based on the first column, we document that the prior period of tax avoidance (*LAG_TAV*) has a significant positive relationship with current investment efficiency (coef. = 0.131, t = 1.682). This finding confirms that lagged tax avoidance is one factor in the current period of investment efficiency. The second column indicates that current tax avoidance has a significant positive with upcoming investment efficiency (*LEAD_INVEFF*) (coef. = 0.367, t = 3.107), and this result is also consistent after adding current investment efficiency variables as an additional control variable, which is shown in the third column.

These additional tests show that both lagged and current tax avoidance are determinants of increased investment efficiency. This also indicates that tax avoidance could be a potent factor in increased investment efficiency. Based on the results, it is revealed that simultaneity bias-time lag is not an issue (Soytas et al. 2019). Based on this test, we obtained consistent results.

4.4.3. Alternative Measurement of Investment Efficiency

To obtain robust results, we also employ alternative measurement investment efficiency to see the consistency of the results. For the alternative measurement, we use a residual value from the investment efficiency model regression by Khurana et al. (2018) as follows:

$$INVEFF2_{i,t} = \beta_0 + \beta_1 MTB_{i,t-1} + \beta_2 ROA_{i,t-1} + \beta_3 CASG_{i,t-1} + \beta_4 AGE_{i,t-1} + \beta_5 LEV_{i,t-1} + \beta_6 LnASSET_{i,t-1} + \beta_7 INVEST_{i,t-1} + \beta_8 YEAR + \beta_9\ INDUSTRY + \varepsilon_{i,t} \quad (4)$$

The following detail of the equation is as follows:

$INVEFF2 =$ Capital Expenditures (CAPX) + Acquisitions (AQC) + Research and Development Expenditures (R&D) − Cash Proceeds from the Sale of Property Plant and Equipment (SPPE) + Depreciation (DPC). This value is scaled by the book value of assets in year t − 1. Missing values for CAPX, AQC, R&D, SPPE, or DPC are set equal to 0.
$MTB_{i,t-1} =$ Market-to-book ratio
$ROA_{i,t-1} =$ The value of return on asset
$CASG_{i,t-1} =$ The value of cash and cash equivalents divided by book value of assets from two years ago
$AGE_{i,t-1} =$ Firm age
$LEV_{i,t-1} =$ Total liabilities divided by total asset
$LOGSALE_{i,t-1} =$ The value of natural logarithm of asset

We also test using the third investment efficiency measurement model by (Shin et al. 2019), with the following equation:

$$INVEFF3_{i,t} = \beta_0 + \beta_1 TQ_{i,t-1} + \sum_{j=2}^{j=10} \beta_j TQ_{i,t-1} X\ Dec_{ji,t-1} + \beta_{11} CFO_{i,t-1} + \beta_{12} GROW_{i,t-1} + \beta_{13} INVEST_{i,t-1} + Year\ fixed\ effect + Industry\ fixed\ effects + \varepsilon_{i,t} \quad (5)$$

The detail of the equation is:

$INVEFF3 =$ Increase in capital expenditures from the cash flow statement
$TQ_{i,t-1} =$ The value of Tobin's Q scaled by book value of total asset
$Dec_{ji,t-1} =$ Industry-year distribution Tobin's Q
$CFO_{i,t-1} =$ The value of cash flow from operation scaled by beginning total assets
$GROW_{i,t-1} =$ Difference of total asset at the end and beginning year, scaled by beginning total asset.
$INVEST_{i,t-1} =$ Lag of increase in capital expenditures from the cash flow statement

We treat these two measurements like the prior measurement by using the absolute value of residual value from the investment regression model and multiplying by −1 to make it easier for us to interpret the results. We document the first hypothesis using alternative measurements shown in Table 11. The results are consistently significant, which shows that firms with a higher level of tax avoidance have a significant positive relationship with investment efficiency at 5% with a *p*-value = 0.022 using the model by Khurana et al. (2018). In addition, Shin et al. (2019) model shows that the *p*-value = 0.025. The results remain significant using both alternative investment efficiency models {Formatting Citation}.

We also employ alternative investment efficiency models for the second hypothesis in Table 12. Similarly, the results indicate insignificant relationships between firms with tax avoidance participating in tax amnesty (*TAV*TAPAR*) and their investment efficiency. Nevertheless, when we did not interact the variables with tax amnesty participation, we obtained a significant result of firms with a higher level of tax avoidance (*TAV*) in both investment efficiency models. The *p*-value of the variable is 0.038 using Khurana et al. (2018), and 0.044 using Shin et al. (2019). This implies that when firms with tax avoidance did not participate in tax amnesty, they were more likely to have a higher investment efficiency in this tax amnesty period.

Table 11. Regression of Tax Avoidance with Investment Efficiency (First Hypothesis) Using Alternative Measurement.

	(1) *INVEFF*2	(2) *INVEFF*3
TAV	0.051 **	0.049 **
	(2.299)	(2.24)
TAPAR	0.004	0.005
	(0.681)	(0.77)
BSIZE	−0.001	−0.001
	(−1.199)	(−0.44)
RMC	−0.007	−0.003
	(−0.752)	(−0.31)
AUCOM	−0.002	−0.007
	(−0.261)	(−1.30)
*BIG*4	0.008	0.006
	(1.326)	(0.78)
AGE	−0.004	−0.006
	(−1.127)	(−1.55)
ROE	−0.001 **	−0.001 *
	(−2.338)	(−1.88)
FSIZE	0.005 *	0.004
	(1.857)	(1.37)
DEBT_EQ	0.003	0.004 **
	(1.212)	(2.00)
Industry Fixed Effect	Included	Included
Year Fixed Effect	Included	Included
_cons	−0.072	−0.021
	(−1.352)	(−0.37)
r2	0.247	0.257
N	1686	1435

t statistics in parentheses. * $p < 0.1$, ** $p < 0.05$

Table 12. Regression of Firms with Tax Avoidance that Participate in Tax Amnesty with Investment Efficiency (Second Hypothesis) Based on Subsample Tax Amnesty Period Using Alternative Measurement.

	(1) *INVEFF*2	(2) *INVEFF*3
*TAV*TAPAR*	−0.041	−0.061
	(−1.491)	(−1.619)
TAV	0.054 **	0.068 **
	(2.087)	(2.016)
TAPAR	−0.002	−0.007
	(−0.407)	(−0.896)
BSIZE	−0.001	−0.002
	(−0.737)	(−1.472)
RMC	−0.007	0.000
	(−1.287)	(0.004)
AUCOM	−0.005	−0.002
	(−1.302)	(−0.385)
*BIG*4	0.009 **	0.006
	(2.028)	(1.040)
AGE	−0.001	−0.003
	(−0.714)	(−1.523)
ROE	−0.000	0.000
	(−1.122)	(0.244)
FSIZE	0.003	0.002
	(1.413)	(0.819)
DEBT_EQ	0.003 ***	0.004 **
	(3.069)	(2.440)
Industry Fixed Effect	Included	Included
Year Fixed Effect	Included	Included
_cons	−0.039	−0.008
	(−1.085)	(−0.168)
r2	0.289	0.246
N	408	401

t statistics in parentheses. ** $p < 0.05$, *** $p < 0.01$.

4.5. Additional Analysis

Overinvestment and Underinvestment Subsamples

Table 13 tests the relationship between tax avoidance and investment efficiency among the separate samples of overinvestment and underinvestment firms. First, we divide the sample when the residual value has not been multiplied by -1. We categorize the samples into overinvestment when the residual value is positive and underinvestment when the residual value is negative. The results show investment efficiency takes place both in firms prone to overinvestment and underinvestment. The results imply that firms with tax avoidance are associated with increased investment efficiency among firms prone to overinvestment and underinvestment.

Table 13. Regression of Tax Avoidance with Investment Efficiency Using Sub-Samples of Over-investment and Under-investment for Additional Analysis.

	Over-Investment Sample	Under-Investment Sample
	INVEFF	
TAV	0.269 **	0.127 **
	(2.352)	(2.007)
TAPAR	0.031	−0.003
	(1.154)	(−0.159)
BSIZE	0.000	0.008 **
	(0.070)	(2.154)
RMC	−0.165 **	0.119 ***
	(−2.384)	(5.014)
AUCOM	0.011	−0.007
	(0.542)	(−0.442)
BIG4	−0.016	−0.057 ***
	(−0.428)	(−2.621)
AGE	−0.034 **	−0.016
	(−2.485)	(−1.581)
ROE	−0.010 ***	−0.012 ***
	(−3.869)	(−5.773)
FSIZE	−0.003	−0.009
	(−0.222)	(−1.064)
DEBT_EQ	0.010	0.013
	(0.405)	(1.571)
Industry Fixed Effect	Included	Included
Year Fixed Effect	Included	Included
_cons	0.283	0.267
	(0.986)	(1.519)
r2	0.350	0.440
N	846	1218

t statistics in parentheses ** $p < 0.05$, *** $p < 0.01$.

Firms with tax avoidance might utilize the source of funding efficiently, particularly in reducing the level of overinvestment and underinvestment, as long as they have a high managerial ability to manage the cash flow (Khurana et al. 2018). Another factor that might mitigate the overinvestment and underinvestment that happen in firms with a high level of free cash flow is the presence of activist shareholders (Richardson 2006). This result is contrary to prior findings, which stated that firms with a high level of free cash flow are more likely to adopt overinvestment (Richardson 2006). According to Khurana et al. (2018), firms with tax avoidance might engage in overinvestment and underinvestment practices if they have weak corporate governance. If these firms generate more cash flow by engaging in tax avoidance practices but still have strong corporate governance to manage the cash flow, this could mitigate the over-investment and under-investment.

5. Conclusions

This study investigated whether firms with a higher level of tax avoidance are more likely to have efficient investments. We use data of nonfinancial public firms listed on the Indonesia Stock Exchange for 2010–2019. We document that firms with a higher level of tax avoidance are more likely to have a higher investment efficiency. This indicates that firms engaging in tax avoidance have a greater probability of retaining greater funds for investment because the cash flows from tax avoidance action can be an essential source of capital for the firm (Edwards et al. 2016). The excess cash flow could facilitate them to harness the proceeds for making positive net present value projects. This result is in accordance with a prior study which stated that the availability of cash flow could directly or indirectly benefit shareholders and managers (Hasan et al. 2021). In addition, these firms engage in complex tax planning strategies, and this tax-related strategy is also considered part of an investment decision (Graham 2003). Therefore, firms with tax avoidance that are accustomed to carrying out complex tax strategies could strategically determine the amount of investment efficiently.

Our results suggest a result contrary to the study by Asiri et al. (2020) as we discover that Indonesian firms with tax avoidance utilize the available amount of cash to invest in value-enhancing projects efficiently. However, we observe an insignificant result when these firms participate in a tax amnesty program during tax amnesty implementation. Nevertheless, we obtain a significant result only when these firms did not participate in tax amnesty in the implementation period. The results also imply that the positive relationship between corporate tax aggressiveness and investment efficiency is driven by the period and post-period of tax amnesty implementation in Indonesia. This could happen because the first-time successful tax amnesty implementation in Indonesia could attract much public attention and be associated with more scrutiny. Therefore, in these periods, the firms already committed to tax avoidance try to manage cash flow and investment efficiently because it would attract much public attention, and they doubt pursuing managerial opportunism.

In addition, the results are consistent by using Propensity Score Matching (PSM), lag and lead variables, and alternative measurements of investment efficiency. We discover that the investment efficiency of tax avoidance is salient in firms both prone to underinvestment and overinvestment.

This study enriches the literature about tax avoidance and investment efficiency. Also, we provide evidence that firms with a higher level of tax avoidance are more likely to have efficient investment decisions. Even this study shows that tax avoidance practice is not always managed negatively, and it could create value in a certain period, for example, during a period that attracts public interest. Practically, the results can be an essential source of information for tax authorities to strengthen tax regulation because Indonesia has a current policy to implement the second tax amnesty program in 2022. Hence, the findings give insight to the tax authorities into the cost and benefit of the second tax amnesty program. Furthermore, tax authorities also should be more aware of a cost-benefit trade-off that could facilitate the opportunistic behavior to obtain benefits at the expense of the state's tax income. Shareholders also should better consider the advantages and disadvantages of corporate tax avoidance and make the proper choice to enhance corporate value. They also may strengthen the tax enforcement regulations and thoroughly consider the implementation of tax amnesty in Indonesia.

However, this study has limitations regarding endogeneity bias because tax avoidance and investment efficiency are more likely to be jointly determined. Even though we have performed several robustness tests and obtained consistent results, we suggest that future studies could include further tests of the certain corporate governance mechanism that might facilitate firms with tax avoidance to have investment efficiency. Future studies could consider the ability and motivation of management to fund their investment efficiently because managerial incentives could drive the decision of corporate tax avoidance and investment efficiency. We also suggest that future research could extend this literature by

using alternative measurements of tax avoidance or studying this topic in a country that implemented repeated tax amnesty, which provides an interesting setting.

Appendix A. Variable Definition

Variables	Definition
Tax avoidance (*TAV*)	The ratio of current effective tax rates, which already multiplied by −1. The higher the ratio means higher tax avoidance.
Dummy tax avoidance (*D_TAV*)	A dummy variable that takes valued 1 for firms with a current effective tax rate that exceeds the median value of −0.2380475, and 0 for otherwise.
Mean value of tax avoidance on each SIC Code (*MEAN_TAV*)	The mean percentage of tax avoidance level for each industry.
Investment efficiency (*INVEFF*)	The absolute value of the residual from the regression model by Huang (2020) multiplied by −1, in which the higher the value indicates a more efficient investment and vice versa.
Investment efficiency (*INVEFF*2)	The absolute value of the residual from the regression model by Khurana et al. (2018) multiplied by −1, in which the higher the value indicates a more efficient investment and vice versa.
Investment efficiency (*INVEFF*3)	The absolute value of the residual from the regression model by Shin et al. (2019) multiplied by a −1, in which the higher the value indicates a more efficient investment and vice versa.
Tax amnesty participation (*TAPAR*)	A dummy variable that takes value 1 if the firm participated in the tax amnesty program, which occurred in 2016 till 2017, and 0 otherwise.
Firm board size (*BSIZE*)	The total number of board of directors and commissioners.
Risk management committee (*RMC*)	A dummy variable that takes value 1 if the firm has a risk management committee and 0 otherwise.
Audit committee (*AUCOM*)	The total number of audit committee members.
Big 4 public accounting firm (*BIG*4)	A dummy variable that takes value 1 if the firm is audited by any Big4 audit firm and 0 otherwise.
Firm age (*AGE*)	The natural logarithm of the age of the firm.
Profitability (*ROE*)	The ratio of net income to total equity.
Firm size (*FSIZE*)	The natural logarithm of total asset.
Debt to equity (*DEBT_EQ*)	The ratio of total debt to total equity.

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