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Analysis of Financial Derivative Effects on Tax Avoidance in Non-Financial Companies Listed on The Indonesian Stock Exchange Market (BEI)

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***Abstract*—The purpose of this study is to analyze whether companies engaged in financial derivative transactions have higher tax avoidance levels and whether the fair value of financial derivatives affects the levels of tax avoidance. This study uses financial statements of non-financial companies listed in the Indonesian Stock Exchange Market (BEI) between 2011 and 2016. In this study, the tax avoidance is measured by three measurements of the effective tax rate (ETR), namely the ratio of income tax expense, current tax expense, and cash tax which is presented in the statement of cash flow. The results of this study indicate that it is not proven that companies engaged in financial derivative transactions have higher tax avoidance levels than companies that do not engage in financial derivative transactions. The results of this study also prove that the higher the fair value of financial derivatives, the higher the tax avoidance levels are.**

Keywords—hedging, tax avoidance, financial derivatives, ETR

I. INTRODUCTION

The growth of financial derivatives remains a polemic, both in Indonesia and globally. Most companies use financial derivatives as an alternative to manage financial risk by protecting revenues and cash flows that are affected by un-favorable volatility of interest rate, foreign currency exchange rate, and commodity prices. However, an increasingly common motive of financial derivative usage is for tax avoidance [1].

Financial derivatives can facilitate two types of tax avoidance, as a benign byproduct of risk management and in transactional avoidance [1]. The benign byproduct of risk management is tax avoidance by reducing volatility in taxable income as profits increase. This practice can be performed in two ways, by creating loss carry forward and by increasing the debt capacity. The increase in debt capacity will be followed by the increase of interest expense which can be treated as a deductible expense. Alternatively, transactional avoidance consists of legal tax avoidance and aggressive (illegal) tax avoidance. Legal tax avoidance is the process performed by considering favorable tax provisions without violating the provisions of taxation while aggressive tax avoidance is the company's ability to coordinate time, characteristics and gain or loss sources to create an extensive ambiguity on taxation of financial derivatives. These practices can work simultaneously with other tax planning and are isolated from the public and tax authority.

Oktavia and Martani [2] indicated that companies with low disclosure levels have higher tax avoidance than companies with high or transparent disclosure levels. The use of derivatives in companies is often hidden (off-balance sheet) from public or government (especially tax authorities) since the transaction details are not required to be disclosed in the financial statements. However, the financial statements require only a brief summary of the role of hedging strategies and the purpose of using financial derivatives [1]. Given the company's high motive for tax avoidance through financial derivatives, it should be necessary to include explicit explanations on whether financial derivatives hedges contribute to the company's financial risk.

In Figure 1, the number of companies reporting financial derivatives usage in non-financial companies in Indonesia has increased significantly since the period 2012 to 2014. However, it declined in 2015 and then increased in 2016. During the last six years, there have been a few companies conducting derivative transactions continuously, new users, ones that have stopped using derivatives, and those with only short contracts, which merely report financial derivatives in some years. Through the explanation of the companies' financial statements, the main purpose of financial derivatives usage is for hedging purposes. Swap and forward contracts become popular transactions used to hedge companies' cash flows which involve foreign currency. However, most companies report their financial derivatives as ineffective hedges, as they do not meet the requirements stated in Statements of Financial Accounting Standards (SFAS) 55. Consequently, gains or losses on foreign currency exchange rates financial derivatives are reported in the income statement that can trigger fluctuation on corporate financial statements.Accordingly, in Article 4 paragraph (1) and Article 6 paragraph (1) of the Income Tax Law, the gain or loss on foreign currency exchange rates may be recognized on a tax basis, if the bookkeeping is conducted consistently in accordance with the prevailing SFAS in Indonesia. Recognizing expenses of realized or unrealized foreign currency exchange rates on the income statement may lead to higher volatility of the company's financial report. In practice, the tax authorities often make a positive correction if the accumulated gain or loss balance of foreign currency exchange rates indicates a loss position. Conversely, if the foreign currency exchange rates are in a profit position, then there will be no negative correction. This shows that the tax

authorities face ambiguity in the taxation of foreign currency exchange rates.

It was indicated on Donohoe's research [1] that financial derivatives users evaded taxes through the measurement of the current tax ratio (CURR-ETR) and cash tax (CASH-ETR) which was presented in the statement of cash flow, but it was not significantly related to the generally accepted

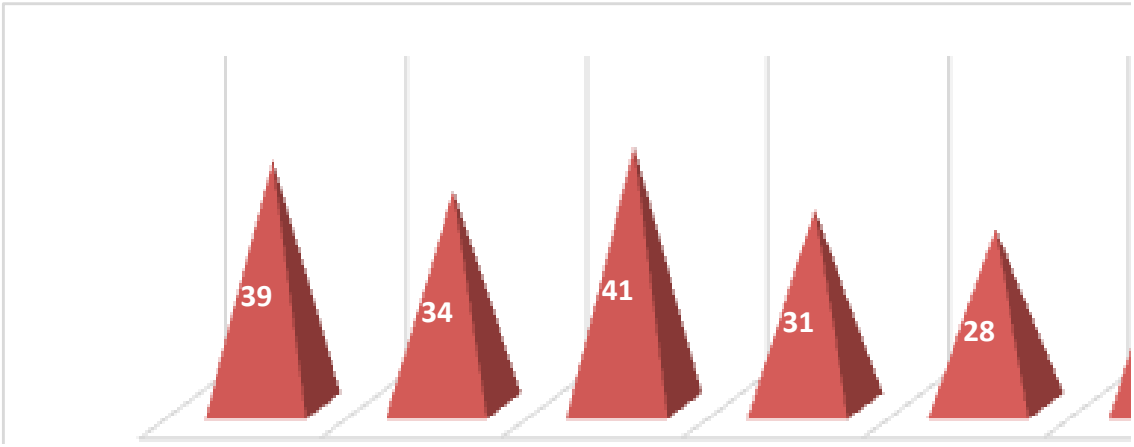

Figure 1. Number of companies reporting the fair value of financial derivatives in non-financial companies. Source: Database of financial statements downloaded from Thomson Router and publication of financial statements by Indonesia Stock Exchange (BEI) in 2011–2016.

accounting principles income tax ratio (GAAP-ETR). In more specific testing it was also indicated that new user companies of financial derivatives avoided significant taxes through the measurement of the CURR-ETR and CASH-ETR. While in the study carried out by Oktavia and Martani [2], there were no user companies conducting tax avoidance. Conversely, they have lower tax avoidance than non-users. Oktavia and Martani [2] indicated that financial derivatives users who hide their financial derivative transaction information tend to have more aggressive tax avoidance behavior compared to companies that transparently disclose financial derivative transaction information.

This study re-tests Oktavia and Martani's research [2] and has tested Donohoe's study [1] by adding some contributions. First, in the measurement of tax avoidance through financial derivatives, this study replaces ETR differential used in previous research with cash tax ratio (CASH-ETR), which is presented in the statement of cash flow. The ratio was measured by cash tax divided by pre-tax income, in accordance with Donohoe's study [1]. Second, the samples of companies used in this study were larger, taken during six years from 2011 to 2016, while Oktavia and Martani's study [2] was only using samples for four years from 2009 to 2012. Third, this study also uses different measurements from Oktavia and Martani's study [2] on solvency and fair value of financial derivatives. Under Oktavia and Martani's study [2], solvency was measured by using total liabilities divided by total assets and fair value of financial derivatives divided by total assets of lagged assets (t−1). While, in this study, solvency is measured by debt to total asset (DTA) and fair value derivative (FVDER) divided by total assets, following Donohoe's studies [1, 3].

Based on the described background, the problem formulation in this study is whether companies engaged in financial derivative transactions have higher tax avoidance levels than companies that do not engage in financial derivative transactions and whether the fair value of financial derivatives has a positive effect on tax avoidance. The purpose of this study is to provide empirical evidence and analysis on whether companies engaged in financial derivative transactions have higher tax avoidance than companies that do not engage in financial derivative transactions and whether the fair value of financial derivatives has a positive effect on tax avoidance.

II. LITERATURE REVIEW

Smith & Stulz [4] developed a positive theory of hedging financial derivatives as a company's financial policy in maximizing corporate profits for three reasons: minimizing taxes, contracting costs and investment decisions. If the hedge can eliminate the variability of pre-tax income, then the tax debt will decrease and be followed by increasing corporate profits. The company may hedge financial derivatives to provide certainty of cash flows to pay the principal and interest expense on loans, thus, it can mitigate the risks of bankruptcy costs and financial distress. Volatile accounting profit will also result in higher managerial costs because managers' compensation often depends on accounting earnings. However, high managerial costs can be avoided through hedging as long as the hedging cost is lower than the additional compensation of managerial costs.

Hedging is an important financial risk management tool as it can offset potential losses that may arise in an investment by taking additional positions in various financial instruments. Hedging is also a tool that is considered to be the most effective and is often used to offset the downsize risks [4]. In hedging, there are two elements, hedged items and hedging instruments [5, 6]. The protected hedged items are designed to be protected. In order to be a hedged item, an item must have a risk to the company, which includes its fair value or future cash flows that may change and affect the company's earnings. Hedged items include recognized assets or liabilities, unrecognized corporate commitments, and transactions to highly probable external parties. There are several derivatives and non-financial derivatives that can be designated as hedging instruments. Nonetheless, non-

financial derivatives can only be used to protect the foreign currency exchange rate.

A financial derivative is a financial instrument or other contract that has three characteristics: (i) its value changes in response to the change in a specified interest rate, commodity price, foreign exchange rate, or other variables, provided that in the case of a non-financial variable the variable is not specific to a party to the contract (underlying); (ii) it requires no initial net investment or an initial net investment that is smaller than would be required for other types of contracts that would be expected to have a similar response to changes in market factors, and (iii) it is settled at a future date. Some types of derivatives are future and forward, swap and option contracts [7, 8]. Forward contracts are similar to future contracts that serve to reduce the risk of future uncertain price changes, the difference is that a future contract is traded on the exchange market while a forward contract is traded over the counter (OTC). A swap contract is an agreement between two parties to exchange cash flow of financial instruments over an underlying asset for a certain period in the future through interest rate swap, cross currency swap and currency interest rate swap. An option contract is an agreement that gives the holder a right without obligation to make any future transactions.

Financial derivative transactions which meet hedging criteria are recorded by using hedge accounting. Conversely, those that do not meet hedging criteria are recorded at fair value through profit or loss (FVTPL). Hedge accounting can be applied only if all certain criteria are met, the hedging relationship is formally established and documented, including: objectives, implementation strategies, hedged items, hedging instrument types, and hedges are expected to be highly effective and measured reliably. The effectiveness of a hedge is an assessment of the extent to which changes in the fair value or cash flows of a hedged item attributable to hedged risk can be offset by changes in the fair value or cash flow of hedging instruments [8].

Hedge accounting is a technique that changes the normal arrangements in the recognition of gains or losses associated with hedged items or hedging instruments to allow gain or loss on hedging instruments to be recognized in profit or loss or recognized in other comprehensive income (OCI). If hedged items are equity instruments in fair value other comprehensive income (FVOCI) in the same period and offsetting the loss or gain on the item being protected its value FVOCI. There are three types of hedge accounting relationships under SFAS 55:

1. Fair value hedge, a hedge of the exposure to changes in fair value of a recognized asset or liability or an unrecognized firm commitment, or an identified portion of such an asset, liability or firm commitment, that is attributable to particular risks and could affect profit or loss.
2. Cash flow hedge, a hedge of the exposure to variability in cash flows, that (i) is attributable to particular risks associated with a recognized asset or liability (such as all or some future interest payments on variable rate debt) or a highly probable forecast transaction, and (ii) could affect profit or loss.
3. Hedge of a net investment in a foreign business operation as defined in SAFS 10.

A. Previous relevant research

Donohoe [1] provided an empirical evidence on the association of financial derivatives transactions with the tax avoidance through the measurement of ETR (GAAP-ETR, CURR-ETR, and CASH-ETR) by using samples of financial derivative users and non-users. The test results indicated that the users had a higher tax avoidance than non-users. Furthermore, this study examined the effect of financial derivative initiation on new user companies on tax avoidance. This test also showed that financial derivative transactions had a negative significant effect on CURR-ETR and CASH-ETR or that financial derivatives users performed higher tax avoidance. However, both of these tests showed that the financial derivatives usage in companies had no significant association with GAAP-ETR.

Donohoe [1] provided a simulation in a swap contract on a loan which consisted of principal and interest payments. Under the taxation perspective, it is allowed to determine or not to determine a certain period of time of loan settlement, thus, this can be used as a loophole for debtors/creditors in recognizing interest expenses or interest income. The recognition can be allocated in different periods, which is by trying to accelerate the interest expense recognition on the current period and to defer the interest income recognition in the future. The recognition of interest expense or interest income in total is true. Nevertheless, the amount will not align with the one that should be allocated in a certain period. This transaction may reduce the tax payment that affects the CASH-ETR and may affect CURR-ETR, but it does not affect GAAP-ETR.

Oktavia and Martani [2] did not find any financial derivative users that had higher tax avoidance than non-users. In contrast, financial derivatives users had lower tax avoidance than non-users. However, when separating the samples of financial derivative users based on the levels of financial derivative disclosure, low disclosure level users with high disclosure level users, it was found out that low disclosure level users had higher tax avoidance levels (off-balance sheet) than the other companies. These findings indicate that financial derivative users who tend to hide their financial derivative information have more aggressive tax avoidance behavior than companies that disclose financial derivative transaction information transparently.

B. Hypothesis development

Based on data collection on financial statements, most financial derivative users reporting their hedging derivative transactions did not meet the requirements on SFAS 55, thus, they were recorded as ineffective hedges. This phenomenon led to gain or loss on the changes of the fair value financial derivative to be reported in the income statement which may cause the income statement to become more volatile and directly affect the ETR.

Besides for hedging purposes, financial derivatives may be used for tax avoidance or speculative purposes. The financial derivatives usage for hedging or speculation purposes cannot be differentiated clearly because it relies solely on explanations in financial statements. The usage of

financial derivatives for hedging purposes can provide a loophole for companies to perform tax avoidance and for speculative purposes. The high advantage offered through financial derivatives on speculative transactions and the absence of clear tax provisions related to gains or losses of speculative/trading transactions can attract companies' interests to use financial derivative transactions.

Until now, the tax authorities have not re-regulated the tax regulation on financial derivatives related to speculation/trading since the revocation of PP no 17 of 2009. Donohoe [1] indicated that America has made special tax provisions of financial derivatives, yet, massive tax avoidances in America are still found. This also triggers the assumption that companies in Indonesia perform in the same way as other companies do abroad.

Therefore, it is suspected that companies engaged in financial derivative transactions perform higher tax avoidance than companies that do not engage in financial derivative transactions. Based on the description above, the first hypothesis in this study is as follow:

H_1. Companies engaged in financial derivative transactions have higher tax avoidance levels than companies that do not engage in financial derivative transactions.

It is stipulated in SFAS 55 that if there is any change in the fair value of a financial derivative that does not meet the hedging criteria (or an ineffective part of the foreign currency exchange rate gains or losses on hedging instruments), the gains or losses arising from a financial derivative transaction shall be immediately recognized in the income statement. Since most companies report ineffective financial derivatives hedges, it is suspected that loss on foreign currency exchange rates increases, which consequently decreases the company's profit in the income statement. Therefore, a second test was performed using as the sample companies that reported the fair value of financial derivatives to find out whether the fair value of financial derivatives affects tax avoidance. In testing the effect of the fair value of financial derivatives on tax avoidance, the second hypothesis in this study is as follow:

H_2. The fair value of financial derivatives has a positive effect on tax avoidance.

III. RESEARCH METHODS

A. Testing model on hypothesis H1

In testing hypothesis H_1, the tax avoidance is measured by using three effective tax ratios (ETR), namely GAAP-ETR, CURR-ETR, and CASH-ETR against pre-tax income. This test uses a dummy variable to determine the effect of companies engaged in financial derivative transactions with companies that do not engage in financial derivative transactions against tax avoidance. The mathematical model can be presented as follows:

$$GAAP\text{-}ETR_{it} = \alpha_0 + \alpha_1 USER_{it} + \alpha_2 DTA_{it} + \alpha_3 CAPINT_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \varepsilon_{it} \quad (3.1)$$

$$CURR\text{-}ETR_{it} = \alpha_0 + \alpha_1 USER_{it} + \alpha_2 DTA_{it} + \alpha_3 CAPINT_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \varepsilon_{it} \quad (3.2)$$

$$CASH\text{-}ETR_{it} = \alpha_0 + \alpha_1 USER_{it} + \alpha_2 DTA_{it} + \alpha_3 CAPINT_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \varepsilon_{it} \quad (3.3)$$

Explanation:

GAAP-ETR	=	Ratio of income tax expense to pre-tax income
CURR-ETR	=	Ratio of current tax expense to pre-tax income
CASH-ETR	=	Ratio of cash tax which is presented in the statement of cash flow to pre-tax income
USER	=	Dummy, 1 for companies engaged in financial derivative transactions and 0 for others
DTA	=	Ratio of total debt to total assets
CAPINT	=	Ratio of net property, plants, and equipments to total assets
SIZE	=	Natural logarithm of total assets

B. Testing model on hypothesis H2

In testing hypothesis H_2, the tax avoidance is measured by using three effective tax ratios (ETR), namely GAAP-ETR, CURR-ETR, and CASH-ETR against pre-tax income. This test uses net fair value derivatives (FVDER) as an independent variable. The mathematical model can be presented as follows:

$$GAAP\text{-}ETR_{it} = \alpha_0 + \alpha_1 FVDER_{it} + \alpha_2 DTA_{it} + \alpha_3 CAPINT_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \varepsilon_{it} \quad (3.4)$$

$$CURR\text{-}ETR_{it} = \alpha_0 + \alpha_1 FVDER_{it} + \alpha_2 DTA_{it} + \alpha_3 CAPINT_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \varepsilon_{it} \quad (3.5)$$

$$CASH\text{-}ETR_{it} = \alpha_0 + \alpha_1 FVDER_{it} + \alpha_2 DTA_{it} + \alpha_3 CAPINT_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \varepsilon_{it} \quad (3.6)$$

Explanation:

GAAP-ETR	=	Ratio of income tax expense to pre-tax income
CURR-ETR	=	Ratio of current tax expense to pre-tax income
CASH-ETR	=	Ratio of cash tax which is presented in the statement of cash flow to pre-tax income
FVDER	=	Net fair value derivative ratio to total assets
DTA	=	Ratio of total debt to total assets
CAPINT	=	Ratio of net property, plants, and equipments to total assets
SIZE	=	Natural logarithm of total assets
ROA		The ratio of pre-tax income to total assets
ε		Error

C. Definition of Operational Variables

Operational variables used in this study consist of dependent variables, independent variables, and control variables:

a. GAAP-ETR

GAAP-ETR is the ratio of income tax expense per one rupiah to pre-tax income. This measurement reflects tax avoidance except for deferral of income or expense affecting accounting earnings.

$$GAAP - ETR = \frac{income\ tax\ expense}{pretax\ income} \quad (3.7)$$

b. CURR-ETR

CURR-ETR is the ratio of current tax expense per one rupiah to pre-tax income. This measurement reflects tax deferral and non-conforming tax avoidance strategies.

$$CURR - ETR = \frac{current\ tax\ expense}{pretax\ income} \quad (3.8)$$

c. CASH-ETR

CASH-ETR is the ratio of cash tax which is presented in the statement of cash flow per one to pre-tax income. This measurement reflects the strategy of deferring tax payment for subsequent periods and non-conforming tax avoidance. This measurement is also affected by tax deferral but is not affected by accrual bookkeeping. In addition, this measurement may experience mismatches, if the taxes paid or tax received by the company is related to different periods.

$$CASH - ETR = \frac{\text{cash tax}}{pretax\ income} \quad (3.9)$$

d. USER

USER is a dummy variable, the companies engaged in financial derivative transactions with a value of 1 and companies that do not engage in financial derivative transactions with a value of 0.

e. Net fair value of derivative instrument (FVDER)

Net fair value of derivative instrument (FVDER) is used in Donohoe [3] to measure the use of financial derivatives when testing the relationship of using financial derivatives to tax avoidance activities. Similar to Donohoe [3], this study measures the use of financial derivatives by utilizing the absolute value of net fair value of derivative instruments divided by total assets:

$$FVDER = \frac{absolute\ value\ of\ net\ fair\ value\ of\ derivative\ instrument}{Total\ asset} \quad (3.10)$$

f. Debt to total asset (*DTA*)

Funding decisions have an impact on company ETR ([9, 10]. Interest expense arising from debt is a deductible expense on gross income, but dividends cannot be a deducted on gross income. Therefore, debt is considered as a deduction on a company's earning and directly affects the ETR. Consistently, most studies find that debt has negative and significant association with ETR.

$$DTA = \frac{Total\ Debt}{Total\ Asset}$$

g. Capital intensity (*CAPINT*)

According to the research of Gupta and Newberry [9], capital intensity (CAPINT) can affect ETR. Capital intensity is measured by the ratio of total property, plant, and equipment divided by total assets. Donohoe [1] also indicated a negative and significant relation between CAPINT and ETR.

$$CAPINT = \frac{Total\ Property,\ Plant,\ and\ Equipment}{Total\ Asset\ t-1} \quad (3.11)$$

h. Size

Based on literature, the effects of a company's size may affect two opposite sides, decreasing and increasing ETR [9]. In the theory of political cost, large-sized companies will have higher ETR. However, they have large resources to do tax planning and to organize all corporate activities to maximize their corporate tax savings.

$$Size = \text{Ln}\ (Total\ Asset) \quad (3.12)$$

i. Return on assets (ROA)

Profitability of companies in this study is measured by return on assets (ROA), the ratio of pre-tax income to total assets. ROA should be positively associated with ETR [9]. However, Donohoe [1] and Derashid and Zang [10] indicated a negative and significant relation between ROA and ETR.

$$ROA = \frac{pretax\ income}{Total\ Asset} \quad (3.13)$$

D. Data and samples

This study uses secondary data of financial reports obtained from the Thomson Reuters database and publication of financial statements by the Indonesian Stock Exchange Market (BEI). Samples in this research are selected by using a purposive sampling method that is a sample selection with certain criteria. Sample criteria in this research can be explained as follows:

a. Samples used in this study are non-financial companies. These companies are chosen because of more specific accounting practices and various financial derivatives usage. Financial companies are excluded from samples because they have a special treatment on tax regulations.

b. Sample period of the study is active companies that have completed financial reporting for the years 2011–2016.

c. Companies engaged in the energy sector are excluded from research samples in anticipation of the existence of special tax regulations on several companies in the energy sector.

d. Companies experiencing negative pre-tax income (loss) during the study period are excluded from the samples because it can result in a bias in the measurement results.

e. Companies identified as users are companies that were engaged in financial derivative transactions during 2011–2016 and include companies engaged in financial derivative transactions in any year during that period.

f. Companies identified as non-users are those that did not engage in financial derivative transactions during 2011–2016, or those other than the ones identified as users.

g. Companies identified as companies having fair value of financial derivative transactions are all companies that

reported the fair value of financial derivatives during 2011–2016.

IV. RESULTS

A. Results of sample selection on hypothesis H1

Table IV shows the number of non-financial companies listed on the Indonesian Stock Exchange Market (BEI) during 2011–2016. There are 353 observations per year or 2118 observations in the six years, excluding companies in the energy sector. Furthermore, companies having incomplete data, such as companies that do not have lagged assets (t−1), assets and debts during the period are eliminated. Following Donohoe [1], this study also eliminated companies having pre-tax income in negative (loss) position to anticipate bias on measurement results. After the elimination, the remaining samples are 1414 observations. Moreover, data outliers of 33 observations meant they are eliminated, so the number of samples used to test hypothesis H_1 becomes 1381 observations, consisting of 335 observations that engage in financial derivative transactions (users) and 1046 observations that do not engage in financial derivative transactions (non-users).

B. Results of sample selection on hypothesis H2

Table II shows the sample selection on hypothesis H_2. The samples used to test the hypothesis H_2 are companies reporting the fair value of financial derivatives during 2011–2016. There are 203 observations that report the fair value of financial derivatives during these six years. Furthermore, data outlier of 11 observations meant they are eliminated, so the number of samples used to test hypothesis H_2 is 192 observations.

C. Descriptive statistics

Table III shows descriptive statistics of companies that engage in financial derivative transactions (Panel A1), companies that do not engage in financial derivative transactions (Panel A2) and companies that report the fair value of financial derivatives (Panel B). The results of ETR measurements in-winsorizing follow Donohoe [1], in which the percentage of ETR above 1% is changed to 1 and the percentage of ETR below 0% is changed to 0. Panel A1 shows that the average GAAP-ETR, CURR-ETR, and CASH- ETR of companies engaged in financial derivative transactions are 26%, 27%, and 35% respectively, while the companies that do not engage in financial derivative transactions in Panel A2 are 27%, 25%, and 31%, respectively. The results of this study indicate that companies that engage in financial derivative transactions have higher average CURR-ETR and CASH-ETR than companies that do not engage in financial derivative transactions. It means companies that engage in financial derivative transactions have lower average tax avoidance.

D. Testing of hypothesis

This study uses unbalanced panel data because the companies that perform financial derivative transactions do not always continuously use derivatives. It depends on the needs of the companies and the economic conditions each year. The usage of unbalanced data is also caused by companies that engage in financial derivative transactions on non-financial companies which are still relatively low. Hypothesis testing begins with the model and classical assumption tests. This model test indicates that the random effect model is the appropriate model to represent the hypothesis tests of H_1 and H_2. In the classical assumption, namely normality test, multicollinearity, heteroscedasticity and autocorrelation were conducted. However, since the random effect model is chosen, then the classical assumption tests such as heteroscedasticity and autocorrelation do not apply to this approach [11]. Furthermore, in relation to the normality test, the central limit theorem (CLT) states that data larger than twenty-five in the random effect model are more than enough to indicate that the data are normally distributed. Since this data has exceeded twenty-five observations, it can be concluded that the data has been normally distributed. Therefore, the classical assumption test that needs to be conducted is only a multicollinearity test. Based on the multicollinearity test, these data do not contain multicollinearity because of the result of a variance inflation factor (VIF) <0.10.

V. DISCUSSION

A. Testing of hypothesis H1

Hypothesis H_1 in this study states that the companies engaged in financial derivative transactions have higher tax avoidance levels than those that do not conduct financial derivative transactions, or ETR users are lower than non-users. Table IV shows that R_-squared *GAAP-ETR*, *CURR-ETR* and *CASH-ETR* are 4%, 5% and 6% respectively, which means that all the independent variables are able to represent the percentage of tax avoidance.

The coefficients of CURR-ETR and CASH-ETR are positive and have a 1% significance level. The results of this study indicate that companies that engage in financial derivative transactions have higher ETR levels than companies that do not engage in financial derivative transactions, meaning that companies that engage in financial derivative transactions have lower tax avoidance levels than companies that do not engage in financial derivative transactions. However, this result indicates a moderate level to GAAP-ETR.

These results are similar to those of Oktavia and Martani [2], which indicates that financial derivative users have lower tax avoidance than non-users. Nevertheless, these results are in contrast with Donohoe's results [1], which found that financial derivative users had higher tax avoidance than non-users. These results indicate that it is not proven that companies engaged in financial derivative transactions have higher tax avoidance than companies that do not engage in financial derivative transactions.

Donohoe [1] stated that although the financial derivatives usage within a company had the potential tax avoidance, not all companies that engage in derivative transactions avoid taxes. The company may use derivative transactions to hedge financial risks that threaten revenues, cost of goods sold, and various operating expenses [12]. In their theory, Smith & Stulz [4] stated that there were three reasons to hedge in maximizing a company's profit. Aside from lowering taxes, the usage of hedging derivative transactions can reduce bankruptcy costs, financial distress costs, and adverse managerial costs.

The differences of these results with Donohoe [1], allegedly, were caused by the use of financial derivatives in Indonesia which is still mostly for hedging purposes, to protect the financial risks on cash flow, corporate earnings and are not intended to avoid taxes.

B. Testing of hypothesis H2

Hypothesis H_2 in this study states that the fair value of financial derivatives has a positive effect on tax avoidance or the fair value of financial derivatives lowers the ETR. Table V shows the results of testing hypothesis H_2. R-squared GAAP-ETR, CURR-ETR and CASH-ETR are 2%, 7% and 3% respectively, which mean that independent variables are able to represent the percentage of tax avoidance.

The coefficients CURR-ETR and CASH-ETR are negative and have a significance level of 5%. The results show the fair value of financial derivatives is negatively associated with ETR, meaning that the fair value of financial derivatives is positively significant associated with tax avoidance. The results of these tests are the same as Donohoe's results [1], which indicated that the new users of financial derivatives lowered CURR-ETR and CASH-ETR. However, these tests have no significant relation to GAAP-ETR. It is because the GAAP-ETR uses income tax expense as the numerator, which is the accumulation of both current tax expense and deferred tax expense. Thus, these expenses have been neutralizing each other.

These results are different from Oktavia and Martani's results [2]. Presumably, this is due to the sample used in testing hypothesis H_2, most companies of which reported ineffective hedging. Consequently, the recognition of gains or losses on the foreign currency exchange rate is reported in the income statement and directly affects the ETR.

C. Sensitivity analysis

Sensitivity analysis is performed to strengthen the results of hypotheses H_1 and H_2 by performing additional testing. The test is conducted by measuring ETR through ETR average, that is the total ETR for three years (t to t + 2) divided by total pre-tax income for three years (t to t + 2), following the measurements on Donohoe's study [1]. The data used are those from the 4 years, 2011 to 2014. Nonetheless, since these measurements use the total of three years (t to t + 2), this test also involves financial statement data in 2015 and 2016.

This additional test's results for hypotheses H_1 and H_2 are in Appendix 1 of this study. Additional testing of hypothesis H_1 results indicates that companies that engage in financial derivatives have CURR-ETR and CASH-ETR with positive ETR coefficients and each of them has a significance level of 5% and 1%. However, it has moderate results on GAAP-ETR. Furthermore, the additional test of hypothesis H_2 results indicates that CURR-ETR and CASH-ETR have negative FVDER coefficients and each of them has a significance level of 1% and 10%. It can be concluded that the results of the additional test for hypotheses H_1 and H_2 indicates consistent results with the main test results.

VI. CONCLUSION

The purpose of this study is to establish whether companies that engage in financial derivative transactions have a higher level of tax avoidance than companies that do not engage in financial derivative transactions. The results of this study indicate that companies that engage in financial derivative transactions have higher ETR levels than companies that do not engage in financial derivative transactions, meaning that companies that engage in financial derivative transactions have lower tax avoidance levels than companies that do not engage in financial derivative transactions. Therefore, it is not proven, that in Indonesia, companies conducting financial derivative transactions have higher tax avoidance levels than companies that do not engage in financial derivative transactions

When testing companies reporting the fair value of financial derivatives, the results show the fair value of financial derivatives is negatively associated with ETR, meaning that the fair value of financial derivatives is positively associated with the tax avoidance. The result is, the higher fair value of financial derivatives is, tax avoidance is also higher.

Based on the above results, in general, the financial derivatives usage in Indonesia is for hedging purposes and not for tax avoidance purposes. However, the higher the fair value of financial derivatives, the tax avoidance is also higher.

If financial derivatives are involved within a company, the foreign currency exchange rate transactions will increase. Negative (losses) balances on foreign currency exchange rates are often disputed between the taxpayer and the tax authority when tax audits are conducted. The main problem occurs when the tax authority faces the difficulty in identifying the source of foreign currency exchange rates loss. Therefore, the company needs to clearly identify the source of recognized gains or losses on foreign currency exchange rates derived from operating or non-operating transactions and those derived from final or non-final transactions.

Companies may use financial derivatives as an alternative to financial risk management in protecting revenues and cash flow that are affected by unfavorable volatilities of interest rates, foreign currency exchange rates and commodity price through effective hedging. However, in order to meet the effective hedge requirements, proper hedging strategy analysis is needed, thus, changes in fair value of financial derivatives may eliminate the risk of items hedged by the company.

Based on the explanation of financial statements, many companies using financial derivatives report hedging derivatives that do not meet the requirements on SFAS 55 and are recorded as ineffective hedges. Consequently, the gain or loss on the change in the fair value of the financial derivative will be reported in the income statement and result in an increasingly volatile and uncertain income statement. Therefore, it is necessary to ensure that companies that report financial derivatives for hedging purposes, either the ones purely intended for hedging or the ones intended for tax avoidance purposes. If financial derivative transactions are designated for hedging purposes, thus, the company needs to disclose, document, and clarify the extent of the hedging

financial derivatives contributions to the company's financial risk because it affects the company's taxation.

Up to the preparation of this study, tax treatment on financial derivatives in Indonesia has not yet been specifically regulated. Thus, the company is free to perform in any way it wishes. Therefore, it is expected that the tax authorities will immediately regulate the taxation of financial derivatives in order to provide a permanent law for taxation of financial derivatives. The longer the situation continues, the greater the loss in tax revenues. Tax avoidance will be more rampant and there will be an increase in the number of tax disputes in the future.

For further research, a qualitative study to investigate the effect of financial derivatives by comparing the company's conditions before and after using financial derivatives is required. Thus, we will be able to see the exact effects of financial derivatives usage on tax avoidance. The limitation of this study is that it cannot ensure whether companies that do not report financial derivative transactions purely act as non-users of financial derivatives because the truth can only be known after performing a direct investigation on companies' transactions.

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APPENDIX

APPENDIX 1: RESULTS OF ADDITIONAL TEST

a. RESULTS OF ADDITIONAL TEST ON HYPOTHESIS H1

***GAAP_ETR* (FEM)**				***CURR_ETR* (FEM)**			***CASH_ETR* (FEM)**			***Predicted***
Variable	***Coefficient***	***Prob.***		***Coefficient***	***Prob.***		***Coefficient***	***Prob.***		***Sign***
C	0.054626	0.9072		0.391405	0.0019	***	0.411851	0.1531		
FVDER	0.726370	0.3684		−2.510.721	0.0087	***	−4.010.223	0.0664	*	-
DTA	0.043411	0.7727		−0.147574	0.0566	**	−0.023387	0.8957		-/+
CAPINT	0.025812	0.6517		0.032906	0.3766		−0.073117	0.4006		-/+
SIZE	0.009238	0.7530		−0.005914	0.4482		0.000755	0.9668		-/+
ROA	−0.093751	0.7044		−0.136050	0.1229		−0.210580	0.2999		-/+
R-squared		0.838934			0.165264			0.049821		
Adjusted R-squared		0.685788			0.105102			0.008146		
S.E. of regression		0.056556			0.114061			0.266796		
Sum squared resid		0.195116			1.444.103			8.114.518		
Log likelihood		2.150.266			9.492.757			−8.642.405		
F-statistic		5.478.030			2.747.014			1.195.467		
Prob(F-statistic)		0.000000	***		0.008349	***		0.315887		
*) Significant at the level α = 10%, **) Significant at the level α = 5%, dan ***) Significant at the level α = 1%										

b. RESULTS OF ADDITIONAL TEST ON HYPOTHESIS H2

***GAAP_ETR* (REM)**				***CURR_ETR*(PEM)**			***CASH_ETR*(PEM)**			***Predicted***
Variable	*Coefficient*	*Prob.*		*Coefficient*	*Prob.*		*Coefficient*	*Prob.*		***Sign***
C	0.423214	0.0000	***	0.356722	0.0000	***	0.290514	0.0002	***	
USER	0.010811	0.6072		0.024889	0.0569	**	0.051071	0.0147	***	-
DTA	−0.008318	0.7392		−0.092564	0.0002	***	−0.073375	0.0603	*	-/+
CAPINT	0.001579	0.9180		−0.033217	0.0262	**	−0.093880	0.0001	***	-/+
SIZE	−0.009737	0.0531	**	−0.002613	0.4455		0.008793	0.1088	*	-/+
ROA	−0.236477	0.0000	***	−0.319990	0.0000	***	−0.459498	0.0000	***	-/+
R-squared		0.021634			0.048706			0.050089		
Adjusted R-squared		0.016479			0.043694			0.045084		
S.E. of regression		0.088478			0.154994			0.248076		
F-statistic		4.196.890			9.717.729			1.000.809		
Prob(F-statistic)		0.000888	***		0.000000	***		0.000000	***	
*) Significant at the level α = 10%, **) Significant at the level α = 5%, dan ***) Significant at the level α = 1%										

Tables

TABLE I
RESULTS OF SAMPLE SELECTION ON HYPOTHESIS H1

Description	2011	2012	2013	2014	2015	2016	Total
Non-financial companies listed on the BEI during 2011–2016, excluding companies in the energy sector	353	353	353	353	353	353	2.118
Companies with incomplete data	−67	−52	−53	–39	−30	−26	−**267**
Companies with loss pre-tax income (negative)	−42	−45	−67	−71	−114	−98	−**437**
Total	244	256	233	243	209	229	**1.414**
Companies with outlier data	−6	−5	−2	−4	−11	−5	−**33**
Samples on H_1 test	238	251	231	239	198	224	**1.381**
Consists of:							
Companies that engage in financial derivative transactions (users)	58	60	56	57	47	57	**335**
Companies that do not engage in financial derivative transactions (non-users)	180	191	175	182	151	167	**1.046**

TABLE II
RESULTS OF SAMPLE SELECTION ON HYPOTHESIS H2

Description	2011	2012	2013	2014	2015	2016	Total
Non-financial companies listed on BEI that report the fair value of financial derivatives during 2011–2016.	30	28	31	41	34	39	203
Companies with outlier data	−1	−1	−1	−5	−2	−1	−11
Samples on H_2 test	**29**	**27**	**30**	**36**	**32**	**38**	**192**

TABLE III
DESCRIPTIVE STATISTICS

Panel A1. Companies that engage in financial derivative transactions/*users* (n = 335)					
Variable	Mean	Median	Maximum	Minimum	Std. Dev.
GAAP_ETR	0.268226	0.252594	1.000.000	0.000000	0.179886
CURR_ETR	0.276612	0.245073	1.000.000	0.000000	0.201028
CASH_ETR	0.356385	0.260218	1.000.000	0.000000	0.298407
DTA	0.310219	0.273080	2.469.505	0.001012	0.231615
CAPINT	0.473022	0.441208	2.494.502	0.000376	0.332592
SIZE	1.581.573	1.577.964	1.938.330	1.159.676	1.350.333
ROA	0.113977	0.076171	0.629394	0.000479	0.118284
Panel A2. Companies That Do Not Engage in Financial Derivative Transactions /Non-Users (n = 1046)					
Variable	**Mean**	**Median**	**Maximum**	**Minimum**	**Std. Dev.**
GAAP_ETR	0.270398	0.254016	1.000.000	0.000000	0.174951
CURR_ETR	0.257805	0.249741	1.000.000	0.000000	0.191864
CASH_ETR	0.310313	0.253680	1.000.000	0.000000	0.271082
DTA	0.247872	0.226993	2.176.679	8.57E–06	0.189216
CAPINT	0.448848	0.374946	2.888.684	0.000103	0.332545
SIZE	1.419.345	1.420.565	1.839.047	9.723.697	1.515.313
ROA	0.085075	0.065432	0.571426	0.000578	0.079602
Panel B. Companies That Report the Fair Value of Financial Derivatives (n = 192)					
Variable	**Mean**	**Median**	**Maximum**	**Minimum**	**Std. Dev.**
GAAP_ETR	0.256809	0.249438	1.000.000	0.000000	0.181197
CURR_ETR	0.257002	0.237799	1.000.000	0.000000	0.190735
CASH_ETR	0.345682	0.255240	1.000.000	0.000000	0.299309
FVDER	0.007515	0.001494	0.103641	7.50E–06	0.015491
DTA	0.310336	0.287748	0.810550	0.001012	0.170887
CAPINT	0.428564	0.377289	1.979.008	0.006432	0.310634
SIZE	1.600.417	1.601.264	1.938.330	1.328.375	1.346.096
ROA	0.117605	0.071716	0.629394	0.000479	0.129207

TABLE IV
RESULTS OF HYPOTHESIS H1

***GAAP_ETR* (REM)**					***CURR_ETR* (REM)**			***CASH_ETR* (REM)**		
Variable	**Predicted ssign**	**Coefficient**	**Prob.**		**Coefficient**	**Prob.**		**Coefficient**	**Prob.**	
C		0.4042	0.0000	***	0.4298	0.0000	***	0.3235	0.0018	***
USER	-	0.0192	0.1125		0.0625	0.0028	***	0.0703	0.0180	***
DTA	-/+	0.0260	0.2840		−0.0658	0.0305	**	−0.0268	0.5359	
CAPINT	-/+	−0.0148	0.2979		−0.0173	0.3442		−0.0951	0.0003	***
SIZE	-/+	−0.0070	0.0246	**	−0.0070	0.1579		0.0076	0.2834	
ROA	-/+	−0.3863	0.0000	***	−0.6306	0.0000	***	−0.9308	0.0000	***
R-squared			0.0465			0.0603			0.0708	
Adjusted R-squared			0.0431			0.0569			0.0674	
S.E. of regression			0.1722			0.1476			0.2112	
F-statistic			1.344.0			1.767.4			2.096.5	
Prob (F-statistic)			0.0000	***		0.0000	***		0.0000	***
*) Significant at the level α = 10%, **) Significant at the level α = 5%, and ***) Significant at the level α = 1%										

TABLE V
RESULTS OF HYPOTHESIS H2

***GAAP_ETR* (REM)**					***CURR_ETR* (REM)**			***CASH_ETR*(REM)**		
Variable	**Predicted sign**	**Coefficient**	**Prob.**		**Coefficient**	**Prob.**		**Coefficient**	**Prob.**	
C		0.3896	0.0152	***	0.5026	0.0023	***	0.3779	0.1524	
FVDER	-	−0.0151	0.9874		−1.9435	0.0488	**	−3.4319	0.031	**
DTA	-/+	−0.1348	0.1534		−0.1387	0.1516		−0.1125	0.4708	
CAPINT	-/+	0.0699	0.1180		0.0617	0.1773		−0.0816	0.2697	
SIZE	−0.0054	5783			−0.0110	0.2732		0.0069	0.6687	
ROA	-/+	−0.2798	0.0146	***	−0.3133	0.0077	***	−0.4131	0.0291	**
R-squared			0.0488			0.0991			0.0598	
Adjusted R-squared			0.0232			0.0748			0.0346	
S.E. of regression			0.1790			0.1834			0.2940	
F-statistic			1.909.4			4.0925			2.3701	
Prob(F-statistic)			0.0946	*		0.0015	***		0.0410	**
*) Significant at the level α = 10%, **) Significant at the level α = 5%, and ***) Significant at the level α = 1%										