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The Effects of Financial Derivatives on Earnings Management and Market Mispricing

Oktavia[*1], Sylvia Veronica Siregar[2], Ratna Wardhani[2], and Ning Rahayu[2]*
[1]Universitas Kristen Krida Wacana, Indonesia
[2]Universitas Indonesia, Indonesia

Abstract: This study aims to examine the effects of financial derivatives on earnings management and market mispricing. A cross-country analysis was applied within the scope of four ASEAN (Association of Southeast Asian Nations) countries that comply with IAS 39, consisting of the Philippines, Indonesia, Malaysia, and Singapore. A sample of 1,395 firm-years of companies using financial derivatives were engaged for study and the evidence shows that the use of financial derivatives for hedging purposes decreases the magnitude of the earnings management. In addition, this study also supports the idea that earnings expectations embedded in the stock returns of companies using financial derivatives, that meet the hedge accounting criteria, reflect the difference in the persistence of cash flow components more accurately than those using financial derivatives for speculative purposes.

Keywords: financial derivatives, earnings management, market mispricing

Introduction

The criteria required by IAS (International Accounting Standard) 39 - Financial Instruments: Recognition and Measurement - to apply hedge accounting for company derivative contracts are strict. Consequently, companies find it difficult to apply hedge accounting to derivative contracts which are actually intended for hedging. When companies fail to meet the hedge accounting criteria for their financial derivatives contracts, any changes in the fair value of such financial derivatives instruments would be immediately recognized in their income statements. This could cause the companies' earnings volatility to increase. Discretionary accruals are often used as a management tool to stabilize earnings. However, if financial derivatives transactions fulfill the hedge accounting criteria, then companies would be able to offset their gains or losses arising from the financial derivatives transactions with the gains or losses arising from their underlying assets. Consequently, using discretionary accruals as an income smoothing tool would be greatly reduced since they would have been substituted by the financial derivatives. The use of financial derivatives by companies can also affect the persistence of their earnings components. Since high-quality earnings are persistent earnings, they can be used as a company's best forecast for its future earnings (Dichev et al., 2013). This outcome is highly desirable for investors because it can enhance their ability to predict a company's future earnings.

Besides their ability to affect the company's earning management, financial derivatives also affect market mispricing. Since ASEAN countries have committed themselves to their convergence with the IFRS, it is without doubt that companies in these countries have also experienced some difficulties in classifying their financial derivatives' transactions as hedging activities, due to the strict accounting standards set by IAS 39. When a company is unable to apply hedge accounting to its derivative contracts, it is deemed to be bad news for investors even though the derivatives transactions were intended for hedging activities. The occurrence causes investors to lose confidence in the persistence of the company's cash flow components. As a result, they will appraise that the cash flow components in companies using speculative financial derivatives would be lower. This is despite the fact that the earnings persistence in companies using financial derivatives for speculative purposes is not lower than in those companies using financial derivatives for hedging purposes. The outcome can be disadvantageous to the companies because lower valuations from investors can affect their stock prices, thereby influencing the investment decisions of potential investors. In this regard, it is important for companies to obtain empirical evidence showing the relationship that exists between the use of financial derivatives and market mispricing.

In comparison, when a company applies hedge accounting to its derivative contracts, the practice is viewed positively by investors because it portrays the respective company's commitment to conducting risk management (e.g. the company's readiness to provide advanced information technologies for formal documentation of hedging relationships). This study assumes that companies using financial derivatives for hedging purposes are more transparent in disclosing information to outside parties than companies using financial derivatives for speculative purposes. Based on that argument and the lack of literature emphasizing the relationship between financial derivatives, and market mispricing, the current study will

thus strive to answer the following research question – Does IAS 39 classify economically/financially respectable hedges as speculative derivatives, thus distorting their use?

This study uses a panel data analysis to investigate the effect of financial derivatives on earnings management and market mispricing. It also uses the iterative generalized nonlinear least-squares estimation procedure, as noted in Mishkin (1985), to investigate the effect of financial derivatives on market mispricing. This study measures financial derivatives by using notional amounts and discretionary accruals, following Kothari, Leone, and Wasley (2005). To split the purposes of the financial derivatives into speculative purposes, and hedging purposes, this study uses the criteria for the fulfillment of hedge accounting, that is, are they fulfilled or not? The results of this study show that the relationship between financial derivatives for hedging purposes (speculative purposes), and accrual-based earnings management is substitutive (complementary). This study also found evidence that supports the idea that earnings expectations embedded in the stock returns of companies using financial derivatives for hedging purposes reflect the difference in the persistence of cash flow components more accurately when compared to companies using financial derivatives for speculative purposes.

This study contributes to the literature in several ways. First, it extends previous studies into the use of financial derivatives as an earnings management tool. Second, it extends the prior research into market mispricing by linking market mispricing with the purpose of using financial derivatives. To the best of our knowledge, this study is also the first to provide empirical evidence showing that the use of financial derivatives leads to market mispricing.

Literature Review

The Effect of Financial Derivatives on Earnings Management

There are two mechanisms that managers can use to smooth companies' earnings. One is through the use of financial derivatives (real earnings management), and the other is through accrual-based earnings management (artificial earnings management). Previous studies (Asdrubali and Kim, 2008; Barton, 2001; Petersen and Thiagarajan, 2000; Pincus and Rajgopal, 2002) have revealed that company managers use financial derivatives, and discretionary accruals, for income smoothing and for reducing earnings volatility. For instance, a company's earnings volatility will increase if managers use financial derivatives for speculative purposes. Therefore, managers are motivated toward using discretionary accruals, so as to reduce the earnings volatility which results from the use of speculative derivatives. This illustration shows that the relationship between such use of derivatives and discretionary accruals is complementary (Barton, 2001; Murwaningsari et al., 2015).

However, if a company uses financial derivatives for hedging purposes, to reduce earnings volatility, the role of the discretionary accruals in reducing earnings volatility would be replaced by the derivatives. The higher the use of the financial derivatives for hedging purposes, the lower the magnitude of earnings management. It indicates that there is a trade-off between the use of financial derivatives and discretionary accruals (Barton, 2001; Huang et al., 2009; Petersen and Thiagarajan, 2000; Pincus and Rajgopal, 2002; Shaw, 2003).

When the use of financial derivatives, which do not meet the criteria for hedge accounting, causes earnings to become too

volatile, managers are motivated to reduce the earnings volatility by using discretionary accruals. This kind of transaction causes the use of financial derivatives for speculative purposes to be positively related to the magnitude of the earnings management. However, when the use of financial derivatives does meet the criteria for hedge accounting, companies would be able to maximize the role of their financial derivatives so as to achieve relatively stable earnings. This kind of transaction reduces the use of the discretionary accruals, which act as the income smoothing tool. Their role is then substituted by the use of financial derivatives. In its aim to re-examine the effect of the use of financial derivatives on the magnitude of earnings management, this study posits the following hypothesis:

H1: *The use of financial derivatives for hedging purposes (speculative purposes) negatively (positively) affects the magnitude of earnings management*

The Effects of Financial Derivatives on Market Mispricing

The use of financial derivatives has a direct impact on a company's cash flow components (Barton, 2001). As mentioned earlier, the use of financial derivatives for hedging purposes tends to decrease cash flow volatility. In comparison, the use of financial derivatives for speculative purposes tends to increase cash flow volatility. This decrease, or increase, in the cash flow's volatility will also have an impact on the increase or decrease of earnings volatility. Therefore, the use of financial derivatives for hedging purposes is expected to increase the persistence of the cash flow components. Conversely, the use of financial derivatives for speculative purposes is expected to decrease the persistence of the cash flow components.

If investors realize that the use of financial derivatives, which do not fulfill the hedge accounting criteria, cause an increase in the volatility of cash flow components and a decrease in the persistence of cash flow components, the investors will become cautious of any company that uses financial derivatives which do not meet the hedge accounting criteria. Such companies' inability to apply hedge accounting to their derivative contracts (when the derivatives are actually intended for hedging) would be viewed negatively by investors. Consequently, they lose confidence in the persistence of these companies' cash flow components.

Nonetheless, if the use of financial derivatives fulfills the criteria of hedge accounting, then companies could apply hedge accounting to their derivative contracts. These companies' are perceived more positively by investors, because of the companies' commitment towards conducting risk management (e.g. the companies' readiness to provide advanced information technologies for formal documentation of their hedging relationships).

Based on the above explanation, this study thus presumes that companies using financial derivatives for hedging purposes are more transparent in disclosing information to outside parties than companies using financial derivatives for speculative purposes. Consequently, the level of market mispricing of the operating cash flow components would be lower in the former than in the latter. Given the fact that the use of financial derivatives has a direct impact on a company's cash flow components (Barton, 2001), this study will also focus on the market mispricing of the company's cash flow components. Based on the aforementioned assumption, the following hypothesis is formulated:

H2: *Earnings expectations embedded in the stock returns of companies using financial derivatives for hedging purposes reflect the difference in the persistence of the operating cash flow components more accurately than companies using financial derivatives for speculative purposes.*

Methods

Sample selection and data source

The annual reports and financial reports, serving as the data source for this study, were obtained from the Thomson Reuters Eikon Database while the stock prices were obtained from the Thomson Reuters Data stream Pro. The period of this study was from 2009 to 2013. Year 2008 was excluded even though in 2008, all the sample countries involved in this study had carried out the IFRS convergence process. This is because the global financial crisis was deemed to have affected the financial condition of companies throughout the world.

The population for this study comprised of companies listed on the stock exchanges in ASEAN countries. According to the data reported by the Bank for International Settlements (BIS), and the International Swaps and Derivatives Association (ISDA), derivative markets in the ASEAN region include the Philippines, Indonesia, Malaysia, Singapore, and Thailand. However, only four of the five countries were used as samples for this study - the Philippines, Indonesia, Malaysia, and Singapore. Thailand was excluded because the Thai Financial Reporting Standards (TFRS) had not adopted the international accounting standards for financial instruments, namely IAS 39 (www.iasplus.com).

The selection of the companies used in this study was based on purposive sampling. The sample criteria used include: (i) Companies that carried out financial derivatives transactions, and also disclosed the notional amount of their financial derivatives. (ii) Companies that were not part of the financial industry. (iii) Companies which calculated their taxable income normally, and used normal corporate income tax rates. (iv) Companies which carry English versions of their financial statements.

In addition, the companies which were noted as financial derivative users were classified into two categories: (1) Users of financial derivatives for hedging purposes - these companies need to reveal that their financial derivatives meet the criteria for hedge accounting. (2) Users of financial derivatives for speculative purposes - these companies do not reveal that their financial derivatives meet the criteria for hedge accounting.

The reasons why the classification of the financial derivative users in this study was based on whether the criteria for hedge accounting were fulfilled or not are: (i) During the hand-collection procedure to find the notional amount and purpose of financial derivatives, the study does not find any company which discloses that its financial derivatives contracts are for speculative purposes. (ii) Although there are about 4% of the financial derivative users that do not reveal the purpose of their financial derivative's usage, it is not appropriate to judge that their use of the financial derivatives is for speculative purposes simply because they do not state the purpose of the financial derivative instruments clearly.

Table 1 presents the sample's selection process. It shows that the total number of samples (for both financial derivatives users and non-financial derivatives users) is 1,761. Upon scrutiny, the final samples used

in this study include companies which used financial derivatives and disclosed the notional amount of their financial derivatives. Companies which have zero derivatives data in any given year are excluded from the test. Table 1 illustrates the final observations of 1,395 companies (unbalanced panel).

Research Models

The equations used for the current study were adopted from previous studies. For example, Equation (1) was modified from Barton (2001) and Murwaningsari et al. (2015). It was used to examine the relationship between the usage of financial derivatives for hedging,

Table 1. Sample Selection Process

Descriptions	Philippines	Indonesia	Malaysia	Singapore
Number of listed companies on the stock exchange	241	477	898	716
Less: Financial services companies	(39)	(69)	(38)	(30)
Less: Companies that calculate their taxable income based on gross revenue or are subjected to special income tax rates	(45)	(130)	(124)	(96)
Full sample (financial derivatives users and non-financial derivatives users) – by country	**157**	**278**	**736**	**590**
Total full sample		**1,761**		

Philippines

Year	*Full Sample*	Companies not using financial derivatives	Companies using financial derivatives but not disclose the notional amount of financial derivatives	Companies which have no complete data	Final observations
2009	157	(134)	(1)	(10)	12
2010	157	(129)	(1)	(11)	16
2011	157	(124)	(1)	(12)	20
2012	157	(123)	(1)	(14)	19
2013	157	(132)	0	(12)	13
					80

Indonesia

2009	278	(247)	(3)	(13)	15
2010	278	(244)	(2)	(12)	20
2011	278	(241)	(4)	(10)	23
2012	278	(238)	(2)	(14)	24
2013	278	(236)	(2)	(13)	27
					109

Malaysia

2009	736	(554)	(2)	(63)	117
2010	736	(537)	(2)	(73)	124
2011	736	(540)	0	(68)	128
2012	736	(530)	(3)	(73)	130
2013	736	(536)	(1)	(65)	134
					633

Table 1. *Continued*

Singapore					
2009	590	(374)	(6)	(115)	95
2010	590	(372)	(9)	(95)	114
2011	590	(362)	(8)	(94)	126
2012	590	(367)	(9)	(90)	124
2013	590	(374)	(5)	(97)	114
					573
The number of final observations from the sample countries					1,395

and for speculative purposes, with the magnitude of earnings management (H1). This study also incorporated five control variables when estimating Equation (1), for example, firm size (SIZE), profitability (ROA), leverage (DTA), a country dummy variable, and a year dummy variable. SIZE was selected to control the effects of company size on the magnitude of the accrual-based earnings management. Large companies tend to be more under the spotlight from analysts and investors, as compared to small companies, which makes them more cautious when taking action (Siregar and Utama, 2008).

ROA was used to control the effects of the company's profitability on the magnitude of accrual-based earnings management. According to the bonus plan hypotheses, managers were more likely to perform income-increasing types of earnings management when companies give bonuses, based on the earnings figures, to managers (Watts and Zimmerman, 1978). The DTA was used to control the effects of the debt level on the magnitude of the accrual-based earnings management. Companies with high levels of debts can reduce the cost of their debts through earnings management (Barton, 2001; Smith and Stulz, 1985).

Additionally, a country dummy variable, and a year dummy variable were used to control the effects of country,

and the observation year, on the magnitude of accrual-based earnings management. Equation (1) is provided below.

$$ABS\_DACC_{it} = \alpha_0 + \alpha_1 DERIV_{it} + \alpha_2 DSPEC_{it} + \alpha_3 DERIV*DSPEC_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROAit + \alpha_6 DTAit + \alpha_7 COUNTRY_{it} + \alpha_8 YEAR_{it} + \varepsilon_{it}$$

$$(1)$$

Hypothesis H1 is accepted if $\alpha_1 < 0$ and $\alpha_1 + \alpha_3 > 0$.

Descriptions:
ABS_DACC_{it} = Absolute value of discretionary accruals.
$DERIV_{it}$ = Notional amount of financial derivatives, scaled by lagged total assets.
$DSPEC_{it}$ = Speculation dummy variable. One if the company has a notional amount of financial derivatives for speculative purposes (does not fulfill the criteria for hedge accounting), greater than 50% of the total notional amount of its financial derivatives, and zero if otherwise.
$SIZE_{it}$ = Natural logarithm of total assets.
ROA_{it} = Return on assets.
DTA_{it} = Total debt to total assets.
$COUNTRY_{it}$ = Country dummy variable.
$YEAR_{it}$ = Year dummy variable.

To address Hypothesis H2, which states that earnings expectations embedded in stock returns reflect the differential persistence of the operating cash flow components more accurately for companies using

financial derivatives for hedging purposes, the Mishkin (1985) test was applied. Following Mishkin (1985), we estimated equations (2) and (3) jointly by using an iterative generalized nonlinear least squares estimation procedure. They are presented below.

$$EARN_{it+1} = \gamma 0 + \gamma_1 CFO_{it} + \gamma_2 NDAC_{it} + \gamma_3 DACC_{it} + \gamma_4 CFO_{it}*DSPEC_{it} + \gamma_5 NDAC_{it}*DSPEC_{it} + \gamma_6 DACC_{it}*DSPEC_{it} + \theta_{it+1}$$
(2)

$$RETURN_{it+1} = \alpha + \beta (EARN_{it+1} - \gamma_0 + \gamma^*_1 CFO_{it} + \gamma^*_2 NDAC_{it} + \gamma^*_3 DACC_{it} + \gamma^*_4 CFO_{it}*DSPEC_{it} + \gamma^*_5 NDAC_{it}*DSPEC_{it} + \gamma^*_6 DACC_{it}*DSPEC_{it}) + \varepsilon_{it+1}$$
(3)

Equation (2) serves as the forecasting equation and Equation (3) serves as the valuation equation. Hypothesis H2 predicts that the ratio of γ_1 to γ^*_1 is significantly smaller than the ratio of $(\gamma_1 + \gamma_4)$ to $(\gamma^*_1 + \gamma^*_4)$. If the ratio of γ_1 to γ^*_1 is significantly different from one, it indicates that the market misprices the persistence of the cash flow components in companies using financial derivatives for hedging purposes. Furthermore, if the ratio of $(\gamma_1 + \gamma_4)$ to $(\gamma^*_1 + \gamma^*_4)$ is significantly different from one, it will also indicate that the market misprices the persistence of the cash flow components in companies using speculative financial derivatives.

To answer Hypothesis H2, the ratio of γ_1 to γ^*_1 needs to be compared with the ratio of $(\gamma_1 + \gamma_4)$ to $(\gamma^*_1 + \gamma^*_4)$. If the value of the ratio of $(\gamma_1 + \gamma_4)$ to $(\gamma^*_1 + \gamma^*_4)$ is significantly greater than the ratio of γ_1 to γ^*_1, it is concluded that the largest market mispricing occurs in companies which use financial derivatives for speculative purposes. Conversely, if the ratio of γ_1 to γ^*_1 is significantly greater than the ratio of $(\gamma_1 + \gamma_4)$ to $(\gamma^*_1 + \gamma^*_4)$, it means that the largest market mispricing occurs in

companies which use financial derivatives for hedging purposes. Hypothesis H2 is thus accepted if the ratio of $(\gamma_1 + \gamma_4)$ to $(\gamma^*_1 + \gamma^*_4)$ is significantly greater than the ratio of γ_1 to γ^*_1.

Variables Measurement

The use of financial derivatives (DERIV) was determined through the total notional amount of financial derivatives divided by the lagged total assets. This measurement has been used in previous studies (Allayannis and Weston, 2001; Barton, 2001; Huang et al., 2009; Murwaningsari et al., 2015). The DSPEC variable used in this study was measured through a dummy variable. As there were quite a number of companies which simultaneously used financial derivatives for hedging and speculative purposes during the same period, the DSPEC variable was thus given a value of one if a company's notional amount of financial derivatives for speculative purposes was greater than 50% of its total notional amount of financial derivatives. The DSPEC was given the value of zero if a company has a notional amount of financial derivatives for speculative purposes less than 50% of the total notional amount of its financial derivatives. In this study, the discretionary accruals were estimated using the model proposed by Kothari et al. (2005) while the residual value was obtained through Equation (4) below:

$$ACC_{it}/TA_{it-1} = \alpha_1 (1/TA_{it-1}) + \beta_1((\Delta REV_{it} - \Delta REC_{it})/TA_{it-1}) + \beta_2(PPE_{it}/TA_{it-1}) + b3ROA_{it} + \varepsilon_{it}$$
(4)

Descriptions:
ACC_{it} = Total accruals, calculated from earnings before extraordinary items substracted by the operating cash flow.

TA_{it-1} = Lagged total assets.
ΔREV = Change in revenue.
ΔREC = Change in accounts receivable.
PPE = Gross property, plants, and equipment.

This study uses the absolute value of discretionary accruals to specifically test Hypothesis H1 because the focus of this hypothesis is the magnitude of earnings management. $EARN_{t+1}$ was measured by earnings before the extraordinary item in year t+1, then divided by the lagged total assets. Stock returns in this study were measured by the cumulative abnormal returns using the market adjusted returns, for a period of 12 months which ended in the third month after the end of a fiscal year. SIZE was measured as the natural logarithm of total assets. ROA was measured as net income divided by the lagged total assets, and leverage (DTA) was measured as total debts divided by total assets.

Results

Descriptive Statistics

The descriptive statistics presented in Table 2 show that the mean value of the use of financial derivatives was greater than the mean value of ABS_DACC. This means that the sample companies used more financial derivatives than discretionary accruals. This is not surprising since the sample companies in this study were mainly financial derivatives users. Table 2 also shows that the average earnings derived for the upcoming year ($EARN_{t+1}$) were positive. This shows that, on average, the sample companies experienced an increase in their earnings, particularly for the coming period. In addition, the CFO variable was noted to carry an average value of 0.0788. This indicates that, on average, the companies have a positive cash flow. From the total

Table 2. Descriptive Statistics

Variabel	N	Mean	Median	Minimum	Maximum	Std. Dev.
DERIV	1,395	0.1164	0.0520	0.0001	1.1342	0.1770
ABS_DACC	1,395	0.0598	0.0428	0.0001	0.2649	0.0548
$RETURN_{t+1}$	1,395	0.0901	0.0280	-0.7409	1.8446	0.4073
$EARN_{t+1}$	1,395	0.0616	0.0507	-0.1846	0.4478	0.0885
CFO	1,395	0.0788	0.0669	-0.2469	0.5058	0.1128
NDAC	1,395	-0.0129	-0.0135	-0.1673	0.1354	0.0492
DACC	1,395	-0.0016	-0.0029	-0.2377	0.2649	0.0811
SIZE	1,395	21.1970	20.3397	17.1222	31.4198	3.1455
ROA	1,395	0.0688	0.0567	-0.1901	0.4460	0.0861
DTA	1,395	0.4753	0.4853	0.0641	0.9578	0.1947
	Dummy Proportion = 1			Dummy Proportion = 0		
	(N = 1091)			(N=304)		
DSPEC	78.21%			21.79%		

DERIV: Notional amount of financial derivatives, scaled by lagged total assets; ABS_DACC: Absolute value of discretionary accrual; DSPEC: one if the firm uses speculative financial derivatives and disclose the notional amount of financial derivatives and zero if otherwise; $RETURN_{it+1}$: Cummulative abnormal return for year $_{t+1}$, measured over the 12-month period ending three months after the firm's fiscal year-end; $EARN_{it+1}$: Earnings before extraordinary item in year $_{t+1}$; CFO: Cash flow from operation; NDAC: Nondiscretionary accrual; DACC: Discretionary accrual; SIZE: natural logarithm of total assets; ROA: Return on asset; DTA: Total debt to total assets.

sample of 1,395 companies being examined, 78.21% of them used financial derivatives for speculative purposes while only 21.79% used financial derivatives for hedging purposes.

Correlation Matrix

Panel A in Table 3 shows that the DERIV variable has a significant positive correlation with the ABS_DACC variable. This indicates that the higher the usage of financial derivatives is, the higher is the magnitude of the earnings management. This positive correlation signifies that the relationship between the use of financial derivatives and the use of discretionary accruals is complementary. As a majority of the sample companies in this study consisted of companies using financial

Panel B in Table 3 shows that the CFO variable has a positive and significant correlation with $EARN_{t+1}$. This indicates that the higher the company's operating cash flow is in the current period, the higher the company's earnings will be in the coming period. In addition, it was revealed that the NDAC variable had a negative and significant correlation with $EARN_{t+1}$. This indicates that the higher the non-discretionary accruals are, the lower the company's earnings will be in the coming period. Panel B in Table 3 also shows that each variable of the NDAC and DACC had a negative and significant correlation with CFO. The negative correlation implies the presence of income smoothing. According to Dechow (1994), when accruals are used to smooth out temporary fluc-

Table 3. Correlation

Panel A: The correlation - model (1)					
	ABS_DACC	**DERIV**	**SIZE**	**ROA**	**DTA**
ABS_DACC	1.0000				
DERIV	**0.0635	1.0000			
SIZE	***0.0711	0.0110	1.0000		
ROA	***0.1284	***0.1089	***0.2213	1.0000	
DTA	***0.1430	***0.1626	***0.3183	***-0.0839	1.0000
Panel B: The correlation - model (2) and (3)					
	$RETURN_{t+1}$	**$EARN_{t+1}$**	**CFO**	**NDAC**	**DACC**
$RETURN_{t+1}$	1.0000				
$EARN_{t+1}$	***0.1979	1.0000			
CFO	***0.1413	***0.5335	1.0000		
NDAC	0.0334	***0.2917	-0.0055	1.0000	
DACC	***-0.0789	***-0.1685	***-0.7762	***-0.0787	1.0000

DERIV: Notional amount of financial derivatives, scaled by lagged total assets; ABS_DACC: Absolute value of discretionary accrual; $RETURN_{it+1}$: Cummulative abnormal return for year $_{t+1}$, measured over the 12-month period ending three months after the firm's fiscal year-end; $EARN_{it+1}$: Earnings before extraordinary item in year $_{t+1}$; CFO: Cash flow from operation; NDAC: Nondiscretionary accrual; DACC: Discretionary accrual; SIZE: natural logarithm of total assets; ROA: Return on asset; DTA: Total debt to total assets.
*) **) ***) indicate significant at 1%, 5%, and 10%, respectively, two-tailed test

derivatives for speculative purposes, it was not surprising that the correlation result between DERIV and ABS_DACC was positive.

tuations in the cash flow, the correlation between the accrual components and the cash flow components becomes negative.

Regression Results

The Effect of Financial Derivatives on Earnings Management

Table 4 shows that the DERIV variable has a negative and significant coefficient. This indicates that the use of financial derivatives for hedging purposes decreases the magnitude of the earnings management. The result further indicates that the relationship between the use of financial derivatives for hedging purposes, and the magnitude of the earnings management, is substitutive. Table 4 also highlights the sum of the coefficients α_1 (DERIV), and α_3 (DERIV*DSPEC) to be significantly positive (-0.0208 + 0.0341 = 0.0133). This result indicates that the use of financial derivatives for speculative purposes has a positive and significant effect on the magnitude of the earnings management. Thus, it is concluded that Hypothesis H1 is accepted.

Table 4. The Effect of Financial Derivatives on Earnings Management

Equation (1)

$ABS\_DACC_{it} = \alpha_0 + \alpha_1 DERIV_{it} + \alpha_2 DSPEC_{it} + \alpha_3 DERIV*DSPEC_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROAit + \alpha_6 DTAit + \alpha_7 COUNTRY_{it} + \alpha_8 YEAR_{it} + \varepsilon_{it}$

Variable	Predicted Sign	Coefficient	t-statistic
Intercept	?	0.0715	5.90***
DERIV	-	-0.0208	-1.34*
DSPEC	?	-0.0035	-0.80
DERIV*DSPEC	+	0.0341	1.72**
SIZE	-	-0.0032	-3.49***
ROA	+	0.0891	3.91***
DTA	+	0.0497	5.85***
COUNTRY		Yes	
YEAR		Yes	
R2		7.65%	
F-statistic		7.23	
N		1395	

DERIV: Notional amount of financial derivatives, scaled by lagged total assets; ABS_DACC: Absolute value of discretionary accrual; DSPEC: one if the firm uses speculative financial derivatives and disclose the notional amount of financial derivatives and zero if otherwise; SIZE: natural logarithm of total assets; ROA: Return on asset; DTA: Total debt to total assets; COUNTRY: Country dummy variables; YEAR: Year dummy variables.
*) **) ***) indicate significant at 1%, 5%, and 10%, respectively, one-tailed test

Mispricing Test Results

The mispricing of the test results is further illustrated in Table 5, which shows that the γ_1 coefficient is not significantly different from γ^*_1. This result shows that the market does not misprice the persistence of the operating cash flow components in companies using financial derivatives for hedging purposes.

Additionally, the coefficient of $\gamma^*_1 + \gamma^*_4$ (0.5821 + [-0.2749]) is also significantly smaller than the coefficient of $\gamma_{1 + } \gamma_4$ (0.8836 + [-0.0004]). This result demonstrates that the market undervalues the persistence of the operating cash flow components in companies using financial derivatives for speculative purposes.

Table 5 also illustrates that the ratio of $(\gamma_{1 + } \gamma_4)$ to $(\gamma^*_{1 + } \gamma^*_4)$ is significantly greater than

the ratio of γ_1 to γ^*_1. This result further confirms that there is no significant difference in the market mispricing of the operating cash flow components between companies using financial derivatives for hedging purposes, and companies using financial derivatives for speculative purposes. This outcome thus verifies that the earnings expectations embedded in the stock returns of companies using financial derivatives for hedging purposes

reflect the difference in the persistence of the operating cash flow components more accurately than companies using financial derivatives for speculative purposes. Thus, it is concluded that Hypothesis H2 is accepted.

Table 5 further highlights that the ratio of $(\gamma_{2+}\gamma_5)$ to $(\gamma^*_{2+}\gamma^*_5)$ does not significantly differ from the ratio of γ_2 to γ^*_2, and the ratio of $(\gamma_{3+}\gamma_6)$ to $(\gamma^*_{3+}\gamma^*_6)$ does not significantly

Table 5. Mispricing Test Results – Speculative Derivative User vs Hedge Derivative User

$EARN_{it+1} = \gamma 0 + \gamma_1 CFOit + \gamma_2 NDAC_{it} + \gamma_3 DACCit + \gamma_4 CFOit*DSPECit + \gamma_5 NDAC_{it}*DSPEC_{it} + \gamma_6 DACC_{it}*DSPEC_{it} + \theta_{it+1}$

$RETURN_{it+1} = \alpha + \beta \,(EARN_{it+1} - \gamma_0 + \gamma^*_1 CFO_{it} + \gamma^*_2 NDAC_{it} + \gamma^*_3 DACC_{it} + \gamma^*_4 CFO_{it}*DSPEC_{it} + \gamma^*_5 NDAC_{it}*DSPEC_{it} + \gamma^*_6 DACC_{it}*DSPEC_{it}) + \varepsilon_{it+1}$

Panel A. Market pricing of earnings components with respect to their implications for one-year-ahead earnings

	Forecast Coefficients			*Valuation Coefficients*	
Parameter	*Estimate*	*Std. Error*	*Parameter*	*Estimate*	*Std. Error*
γ_1 (CFO)	0.8836	0.0387	γ^*_1 (CFO)	0.5821	0.2582
γ_2 (NDAC)	1.0218	0.0724	γ^*_2 (NDAC)	1.0342	0.4724
γ_3 (DACC)	0.7997	0.0627	γ^*_3 (DACC)	0.3850	0.4159
γ_4 (CFO*DSPEC)	-0.0004	0.0351	γ^*4 (CFO*DSPEC)	-0.2749	0.2342
γ_5 (NDAC*DSPEC)	-0.1445	0.0707	γ^*_5 (NDAC*DSPEC)	-0.4490	0.4642
γ_6 (DACC*DSPEC)	-0.0034	0.0593	γ^*_6 (DACC*DSPEC)	0.5378	0.3986

Panel B. Market efficiency tests

Null Hypotheses	*Likelihood Ratio Statistic*	*Significance*
$\gamma_1 = \gamma^*_1$	1.40	0.2369
$\gamma_2 = \gamma^*_2$	0.00	0.9739
$\gamma_3 = \gamma^*_3$	1.00	0.3162
$\gamma_4 = \gamma^*_4$	1.40	0.2366
$\gamma_5 = \gamma^*_5$	0.42	0.5145
$\gamma_6 = \gamma^*_6$	1.91	0.1670
$(\gamma_1 + \gamma_4) = (\gamma^*_1 + \gamma^*_4)$	8.96	0.0028***
$(\gamma_2 + \gamma_5) = (\gamma^*_2 + \gamma^*_5)$	0.84	0.3588
$(\gamma 3 + \gamma_6) = (\gamma^*_3 + \gamma^*_6)$	0.22	0.6415
$(\gamma_1 + \gamma_4)/(\gamma^*_1 + \gamma^*_4) = \gamma_1/\gamma^*_1$	2.74	0.0980*
$(\gamma_2 + \gamma_5)/(\gamma^*_2 + \gamma^*_5) = \gamma_2/\gamma^*_2$	0.52	0.4692
$(\gamma_3 + \gamma_6)/(\gamma^*_3 + \gamma^*_6) = \gamma_3/\gamma^*_3$	1.84	0.1746

$RETURN_{it+1}$: Cummulative abnormal return for year $_{t+1}$, measured over the 12-month period ending three months after the firm's fiscal year-end; $EARN_{it+1}$: Earnings before extraordinary item in year $_{t+1}$; CFO: Cash flow from operation; NDAC: Nondiscretionary accrual; DACC: Discretionary accrual; DSPEC: one if the firm uses speculative financial derivatives and disclose the notional amount of financial derivatives and zero if otherwise.
*) **) ***) indicate significant at 1%, 5%, and 10%, respectively, two-tailed test

differ from the ratio of γ_3 to γ^*_3. These findings thus suggest that there is no significant difference in the market mispricing of the discretionary accrual, and the non-discretionary accrual components, between companies using financial derivatives for hedging purposes, and companies using financial derivatives for speculative purposes. The fact that no significant difference was found in the test result is attributed to the fact that financial derivatives only have a direct impact on the volatility of the cash flow components.

Additional Tests: Developed Countries versus Emerging Countries

The Effect of Financial Derivatives on Earnings Management

To evaluate whether a country's economy affects the results that were presented in Table 4, we performed a few more tests similar to those in Table 4. First we partitioned our samples according to the countries' economies. Malaysia and Singapore were deemed to be developed countries, while Indonesia and the Philippines were classified as emerging countries. Our test results (unreported) showed that the DERIV variable in developed and emerging countries carried a negative and significant coefficient. This indicates that for both the developed and emerging countries, the use of financial derivatives for hedging purposes had negatively, and significantly, affected the magnitude of the earnings management. The results further showed that in both the developed and emerging countries, the sum of the coefficients of α_1 (DERIV), and α_3 (DERIV*DSPEC) carried a positive result. This indicates that the use of financial derivatives for speculative purposes, had positively, and significantly, affected the magnitude of the earnings management.

Mispricing Test

To investigate whether a country's economy affected the results presented in Table 5, we likewise partitioned our samples according to each country's economy. We then performed tests which were similar to those in Table 5. Our results (unreported) showed that in developed countries, the market does not misprice the persistence of the operating cash flow components in companies using financial derivatives for hedging purposes. However, the market undervalues the persistence of the operating cash flow components in companies using financial derivatives for speculative purposes. We also found (unreported) that in developed countries, the ratio of $(\gamma_{1+}\gamma_4)$ to $(\gamma^*_{1+}\gamma^*_4)$ was significantly greater than the ratio of γ_1 to γ^*_1. These findings support the acceptance of Hypothesis H2.

We further found evidence which showed that in emerging countries, the market misprices the persistence of the operating cash flow components for both types of companies, those using financial derivatives for hedging purposes, and those using financial derivatives for speculative purposes. Finally, we also found that in emerging countries, there was no significant difference in the market mispricing of the operating cash flow components between both types of companies. These findings do not support Hypothesis H2.

Findings And Discussions

The Effect of Financial Derivatives on Earnings Management

The test results showing the effect of financial derivatives on earnings management indicate that there was a trade-off between

the use of financial derivatives for hedging purposes, and the magnitude of the accrual-based earnings management. This result is consistent with the results of previous studies (Barton, 2001; Huang et al., 2009; Petersen and Thiagarajan, 2000; Pincus and Rajgopal, 2002; Shaw, 2003). Previous findings had shown that the effect of the use of financial derivatives for hedging purposes on accrual-based earnings management in ASEAN countries adopting the IFRS was consistent with the results found in countries that do not adopt the IFRS. Based on this, it was concluded that regardless of the type of accounting standards used, be it US GAAP or the IFRS, the use of financial derivatives for hedging purposes decreased a company's earnings volatility. Financial derivatives were also used as a replacement for discretionary accruals, as an income smoothing tool for companies. This means that if the earnings volatility was decreased by the use of financial derivatives for hedging purposes, a company would not need to use discretionary accruals as a tool to reduce its earnings volatility.

The test results also showed that there was a complementary relationship between the use of financial derivatives for speculative purposes, and the magnitude of accrual-based earnings management. This result is consistent with previous studies (Barton, 2001; Murwaningsari et al., 2015; Papa, 2010). Previous findings had indicated that the effect of using financial derivatives for speculative purposes, on accrual-based earnings management in ASEAN countries that have adopted the IFRS, was consistent with the results found in countries that do not adopt the IFRS. Based on this, it was thus concluded that regardless of the type of accounting standards used, the use of financial derivatives for speculative purposes leads to an increase in earnings volatility. This occur-

rence could prompt managers to reduce the earnings volatility, and to stabilize earnings by using discretionary accruals. Therefore, the relationship between the use of financial derivatives for speculative purposes, and the earnings management activities using discretionary accruals, is said to be complementary. The reason why there was no difference in the findings between countries adopting IFRS, and countries adopting the US GAAP, was because there is not much difference between both accounting standards.

The Effects of Financial Derivatives on Market Mispricing

The results further showed that the market did not misprice the persistence of the operating cash flow components in companies using financial derivatives for hedging purposes. However, the market did misprice the persistence of the operating cash flow components in companies using financial derivatives for speculative purposes, causing them to be lower. This low pricing was given because investors were likely to be wary of companies using financial derivatives for speculative purposes. As discussed earlier, a company's inability to apply hedge accounting to its derivative contracts is perceived negatively by investors. Consequently, investors lose confidence in the persistence of the cash flow components of such companies.

The results in this study thus suggest that the level of the market mispricing of the operating cash flow components is lower in companies using financial derivatives for hedging purposes than in companies using financial derivatives for speculative purposes. Based on this, it was thus concluded that earnings expectations embedded in the stock returns of companies using financial

derivatives for hedging purposes can reflect the difference in the persistence of the operating cash flow components of earnings more accurately than companies using financial derivatives for speculative purposes. This result can be attributed to the fact that companies using financial derivatives for hedging purposes were more transparent in disclosing information to outside parties. Therefore, investors in such companies have more information for their decision making. In turn, this enabled the companies to reduce the level of the market mispricing. These findings proved that the purpose of using financial derivatives has an effect on market mispricing. This outcome thus enriches the existing literature on market mispricing.

When the sample companies were partitioned based on country's economy, there was evidence to suggest that, in emerging countries, the market mispriced the persistence of the operating cash flow components for both types of companies – those using financial derivatives for hedging purposes as well as those using financial derivatives for speculative purposes. Poor quality financial reporting was the reason for such findings. This made it difficult for investors to distinguish the use of financial derivatives for hedging purposes from the use of financial derivatives for speculative purposes.

Sensitivity Tests

A sensitivity test was conducted to ensure the reliability of the regression results and the mispricing test results. First, the speculation dummy variable (DSPEC) was measured by using a proportion of the notional amount of financial derivatives for speculative pur-

Table 6. Sensitivity Test Results – DSPEC was measured by using a proportion

Equation (1)

$ABS\_DACC_{it} = \alpha_0 + \alpha_1 DERIV_{it} + \alpha_2 DSPEC_{it} + \alpha_3 DERIV*DSPEC_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROAit + \alpha_6 DTAit + \alpha_7 COUNTRY_{it} + \alpha_8 YEAR_{it} + \varepsilon_{it}$

Variable	Predicted Sign	Coefficient	t-statistic
Intercept	?	0.0701	***5.78
DERIV	-	-0.0239	*-1.43
DSPEC	?	-0.0029	-0.64
DERIV*DSPEC	+	0.0380	**1.77
SIZE	-	-0.0031	***-3.42
ROA	+	0.0894	***3.92
DTA	+	0.0501	***5.89
COUNTRY		Yes	
YEAR		Yes	
R-Square		7.69%	
F-statistic		7.21	
N		1395	

DERIV: Notional amount of financial derivatives, scaled by lagged total assets; ABS_DACC: Absolute value of discretionary accrual; DSPEC: Proportion of the notional amount of speculative derivatives; SIZE: natural logarithm of total assets; ROA: Return on asset; DTA: Total debt to total assets; COUNTRY: Country dummy variables; YEAR: Year dummy variables.
*) **) ***) indicate significant at 1%, 5%, and 10%, respectively, one-tailed test

poses (which does not meet the criteria for hedge accounting). The result of the sensitivity test is consistent with the main test results.

Second, the test only used observations from the period of 2010, 2011, 2012,

and 2013. The reason is because on January 1, 2010, Indonesia and Malaysia implemented the accounting standards which refer to the IFRS (IAS 39). Year 2009 was excluded from the test because in that year Indonesia and Malaysia still applied the ac-

Table 7. Sensitivity Test Results for Equation (1) –
Use observations on the period of 2010, 2011, 2012, and 2013

Equation (1)

$ABS\_DACC_{it} = \alpha_0 + \alpha_1 DERIV_{it} + \alpha_2 DSPEC_{it} + \alpha_3 DERIV*DSPEC_{it} + \alpha_4 SIZE_{it} + \alpha_5 ROAit + \alpha_6 DTAit + \alpha_7 COUNTRY_{it} + \alpha_8 YEAR_{it} + \varepsilon_{it}$

Variable	Predicted Sign	Coefficient	t-statistic
Intercept	?	0.0771	***4.80
DERIV	-	-0.0246	*-1.33
DSPEC	?	-0.0042	-0.67
DERIV*DSPEC	+	0.0407	**1.67
SIZE	-	-0.0030	***-2.64
ROA	+	0.0858	***2.90
DTA	+	0.0510	***4.68
COUNTRY		Yes	
YEAR		Yes	
R-Square		7.39%	
F-stat		5.51	
p-value		***0.0000	
N		1156	

DERIV: Notional amount of financial derivatives, scaled by lagged total assets; ABS_DACC: Absolute value of discretionary accrual; DSPEC: one if the firm uses speculative financial derivatives and disclose the notional amount of financial derivatives and zero if otherwise; SIZE: natural logarithm of total assets; ROA: Return on asset; DTA: Total debt to total assets; COUNTRY: Country dummy variables; YEAR: Year dummy variables.
*) **) ***) indicate significant at 1%, 5%, and 10%, respectively, one-tailed test

Table 8. Sensitivity Test Results for Mispricing Test –
Use observations on the period of 2010, 2011, 2012, and 2013

$EARN_{it+1} = \gamma_0 + \gamma_1 CFOit + \gamma_2 NDAC_{it} + \gamma_3 DACCit + \gamma_4 CFOit*DSPECit + \gamma_5 NDAC_{it}*DSPEC_{it} + \gamma_6 DACC_{it}*DSPEC_{it} + \theta_{it+1}$

$RETURN_{it+1} = \alpha + \beta (EARN_{it+1} - \gamma_0 + \gamma^*_1 CFO_{it} + \gamma^*_2 NDAC_{it} + \gamma^*_3 DACC_{it} + \gamma^*_4 CFO_{it}*DSPEC_{it} + \gamma^*_5 NDAC_{it}*DSPEC_{it} + \gamma^*_6 DACC_{it}*DSPEC_{it}) + \varepsilon_{it+1}$

Forecast Coefficients			*Valuation Coefficients*		
Parameter	Estimate	Std. Error	Parameter	Estimate	Std. Error
γ_1 (CFO)	0.8690	0.0408	γ^*_1 (CFO)	0.6517	0.2845
γ_2 (NDAC)	1.0736	0.0796	γ^*_2 (NDAC)	0.3081	0.5696
γ_3 (DACC)	0.8369	0.0668	γ^*_3 (DACC)	0.7101	0.4604
γ_4 (CFO*DSPEC)	-0.0145	0.0375	γ^*_4 (CFO*DSPEC)	-0.3380	0.2666
γ_5 (NDAC*DSPEC)	-0.1141	0.0791	γ^*_5 (NDAC*DSPEC)	-0.4588	0.5493
γ_6 (DACC*DSPEC)	-0.0179	0.0641	γ^*_6 (DACC*DSPEC)	0.1590	0.4430

Tabel 8. *Continued*

Null Hypotheses	Likelihood Ratio Statistic	Significance
$\gamma_1 = \gamma^*_1$	0.59	0.4439
$\gamma_2 = \gamma^*_2$	1.91	0.1666
$\gamma_3 = \gamma^*_3$	0.07	0.7847
$\gamma_7 = \gamma^*_7$	1.35	0.2455
$\gamma_8 = \gamma^*_8$	1.38	0.2397
$\gamma_9 = \gamma^*_9$	5.31	**0.0212
$(\gamma_1 + \gamma_4) = (\gamma^*_1 + \gamma^*_4)$	6.35	**0.0117
$(\gamma_2 + \gamma_5) = (\gamma^*_2 + \gamma^*_5)$	9.47	***0.0021
$(\gamma_3 + \gamma_6) = (\gamma^*_3 + \gamma^*_6)$	0.03	0.8728
$(\gamma_1 + \gamma_4)/(\gamma^*_1 + \gamma^*_4) = \gamma_1/\gamma^*_1$	3.23	*0.0724
$(\gamma_2 + \gamma_5)/(\gamma^*_2 + \gamma^*_5) = \gamma_2/\gamma^*_2$	0.73	0.3943
$(\gamma_3 + \gamma_6)/(\gamma^*_3 + \gamma^*_6) = \gamma_3/\gamma^*_3$	0.14	0.7045

$RETURN_{it+1}$: Cummulative abnormal return for year $_{t+1}$, measured over the 12-month period ending three months after the firm's fiscal year-end; $EARN_{it+1}$: Earnings before extraordinary item in year $_{t+1}$; CFO: Cash flow from operation; NDAC: Nondiscretionary accrual; DACC: Discretionary accrual; DSPEC: one if the firm uses speculative financial derivatives and disclose the notional amount of financial derivatives and zero if otherwise.
*) **) ***) indicate significant at 1%, 5%, and 10%, respectively, two-tailed test

counting standards for derivative financial instruments that refer to the US GAAP. The result of this sensitivity test is also consistent with the results of the main test.

Conclusion and Implications

This study had found that the relationship between the use of financial derivatives for hedging purposes, and accrual-based earnings management was substitutive. In addition, the relationship between the use of financial derivatives for speculative purposes, and accrual-based earnings management, was complementary. The outcome derived from this study also shows that the results of this study were consistent with the results of prior studies which used countries adhering to the US GAAP. Moreover, this study also discovered that the level of market mispricing of the operating cash flow components was lower in companies using financial derivatives for hedging, as compared to those

using the financial derivatives for speculation. This study appears to be the first of its kind to prove that the purpose for using financial derivatives has an impact on market mispricing. The research implications thus enriched the literature on market mispricing by examining the effects of the purpose of financial derivatives usage on market mispricing.

The results of this study provided four implications. First, the results offered useful information to investors to avoid mispricing whilst assessing earnings components. They also helped investors to make wise investment decisions, when focussing on companies' financial reports. Investors' lack of confidence in companies using financial derivatives that failed to meet the hedge accounting criteria could potentially cause investors to experience mispricing when assessing the persistence of the cash flow components of earnings. This observation was based on the results which showed that investors assessed the persistence of the cash

flow components in companies using financial derivatives for speculative purposes lower than others, even though the persistence of the cash flow components in companies using speculative financial derivatives did not differ from companies using financial derivatives for hedging purposes. Therefore, the level of the market mispricing on the operating cash flow components was higher in companies using financial derivatives for speculative purposes than in companies using financial derivatives for hedging purposes.

Second, the results are beneficial to companies using financial derivatives. The findings of this study had proven that a company's inability to apply hedge accounting for its financial derivatives could reduce the investors' confidence, in turn, companies using financial derivatives for speculation would be valued less, Therefore, companies must be able to recognize the negative consequences of using financial derivatives which do not qualify for hedge accounting.

Third, the results can also contribute to the boards of financial accounting standards for the respective countries. The findings derived from this study indicated that there was market mispricing of the cash flow components of the earnings in companies using financial derivatives for speculative purposes. This information can encourage the boards of financial accounting standards to prepare, and establish accounting policies that govern the disclosure of derivative instruments in a format that will be easier to understand, and be identified by investors. This will: (i) Assist investors in understanding and identifying the types of derivative instruments used by a company, the purpose of using these derivative instruments, the risk exposures that drive the use of these instruments, as well

as the differences that exist between the accounting hedges (derivatives that meet the criteria for hedge accounting), economic hedges (derivatives that aim to hedge risks), and derivatives for trading activities. (ii) Increase the availability of information for investors when making investment decisions and reduce the level of market mispricing.

Fourth, capital markets in the respective countries will also gain some advantages. The findings of this study provide useful information for the respective capital market supervisory authorities to learn about the negative impacts that the use of financial derivatives for speculative purposes will have on market mispricing. This information can encourage the authorities to create a better protection mechanism for investors in the capital markets, for example, through monitoring, so as to ensure company compliance with the financial accounting standards in the respective countries, especially in disclosing their financial derivative instruments.

Despite the many contributions mentioned above, this study is also affected by two limitations. First, this study only used the criteria of meeting or not meeting the hedge accounting requirement when classifying the users of financial derivatives into two categories (financial derivatives users for speculative purposes, and financial derivatives users for hedging purposes). Future research may consider using other alternatives to separate the use of financial derivatives for speculative purposes from the use of financial derivatives for hedging purposes. Second, this study only used four countries in the ASEAN region as sample countries. Future research should expand on the research by using countries in the Asia-Pacific region.

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