

CEO Overconfidence and Tax Aggressiveness: The Role of CEO Age and Firm Size

Nur LISTIANI¹, Supramono SUPRAMONO², Theresia Woro DAMAYANTI³, Yeterina Widi NUGRAHANTI⁴

¹ Alumni of Doctoral Program in Management, Faculty of Economics and Business, Satya Wacana Christian University, Indonesia

²⁻⁴ Faculty of Economics and Business, Satya Wacana Christian University, Indonesia

nlistiani99@gmail.com

supramono@uksw.edu

theresia.damayanti@uksw.edu

yeterina.nugrahanti@uksw.edu*

Abstract: *This study aims to investigate the effects of CEO overconfidence on tax aggressiveness and analyses the role of CEO age and firm size as moderators. The study conducted 590 observations of manufacturing firms listed on the Indonesia Stock Exchange from 2010 to 2019. The data was analyzed using the FGLS method. The results show that CEO overconfidence leads to the practice of tax aggressiveness. Other results confirmed that the CEO age strengthens the CEO overconfidence effect to practice tax aggressiveness. Furthermore, this study found that the firm size enhances the effect of CEO overconfidence to engage in tax aggressiveness. These findings suggest that manufacturing firms should not allow managers to exhibit overconfidence, considering that it can raise the likelihood of tax aggressiveness practices, which can be detrimental to the firm's long-term performance.*

Keywords: CEO overconfidence, tax aggressiveness, CEO age, firm size

JEL Classification: G41, H26, M41

Introduction

Tax aggressiveness is a crucial issue because it is prone to occur in emerging countries, including Indonesia, where most of their income sources depend on taxes (Syukur & Jongsureyapart, 2023). Referring to the state of tax justice report 2023, tax revenue loss in Indonesia reached 2,806.3 USD. This value is the highest tax loss compared to several other emerging countries in the ASEAN region. It turns out that 97.5% of the total tax revenue loss in Indonesia above is due to corporate tax abuse (Tax Justice Network, 2023), which is

* Corresponding author: Yeterina Widi Nugrahanti

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closely related to tax aggressiveness. Therefore, it is interesting to investigate further the factors that contribute to tax aggressiveness.

Based on the perspective of upper echelon theory (Hambrick & Mason, 1984), top management or CEO has the authority to determine the strategic direction of the company. Therefore, tax aggressiveness is also inseparable from the role of the CEO. Through his authority, the CEO can influence tax policy by allocating resources, regulating compensation for tax directors, raising costs, and recording low real income (Sucahyo et al., 2020). The upper echelon theory also emphasizes that the psychological characteristics of CEOs, such as overconfidence, have the potential to have a significant impact on strategic optimization. CEO overconfidence is predicted to be related to tax aggressiveness because they will tend to overestimate their ability to generate profits for the company, including by practicing tax aggressiveness (Carrer & Slavov, 2021).

Overconfidence has received a lot of attention in the behavioral finance literature over the last two decades to explain investor behavior that causes mispricing in the equity market (Abideen et al., 2023). Overconfidence is a sort of behavioral bias that receives more attention than other types of biases because it has a more genuine and dominant influence on managerial decision-making (Shah et al., 2018). Overconfidence can be experienced not just by investors but also by firm managers, which is known as CEO overconfidence and is frequently referred to as one of the causes of CEOs making biased financial decisions (Kim et al., 2022). CEO overconfidence tends to overlook existing dangers (Hayward et al., 2004) and is overly optimistic in forecasting future profitability (Young & Florence, 2019). They even take on projects with a negative net present value (Zhang & Yang, 2018). As a result, CEO overconfidence is associated with overinvestment (Zia et al., 2017).

Overinvestment, defined as an investment expenditure that exceeds a firm's financial capability and ability (Hoshmand & Khanagha, 2014), can cause huge and even negative cash flow. Firms might boost their cash flow by being more aggressive with their taxation (Bimo et al., 2019). Tax charges are frequently regarded as a substantial cost for firms, and aggressive tax policies are thought to be capable of increasing the cash flow. Furthermore, CEO overconfidence frequently overestimates predicted earnings. One strategy to decrease the gap between the predicted and actual earnings is to utilize tax aggressiveness as an earnings management instrument (Duhoon & Singh, 2022). However, previous studies show inconsistent results. Studies conducted by Sutrisno and Pirzada (2020) and Ilaboya and Ohiokha (2016) reveal that CEO overconfidence causes tax aggressiveness; another study shows the opposite result (Carrer & Slavov, 2021). The firm's choice of tax aggressiveness may not only be based on CEO overconfidence but there are other interacting factors.

Previous studies have found that tax aggressiveness increases with the managers' ages (Jiang & Kim, 2022). Meanwhile, other studies have provided evidence that firm size is a determinant of tax aggressiveness (Riguen et al., 2021, Flamini et al., 2021; Putica, 2023). However, this study positions CEO age and firm size as a moderating variable that can boost or diminish the effect of CEO overconfidence on tax aggressiveness. To the best of our knowledge, no study has been conducted to explain the moderating role of the CEO age and firm size in allowing for a heterogeneous effect of CEO overconfidence on tax aggressiveness.

This study aims to investigate (a) the effects of CEO overconfidence on tax aggressiveness and (2) the role of CEO age and firm size in moderating the effects of CEO overconfidence on tax aggressiveness. We expect that this study will fill the gap in the existing literature by providing an empirical framework demonstrating the relationship between CEO

overconfidence and tax aggressiveness based on individual and firm-specific characteristics applicable in developing countries. The results of this study also provide policy implications in an effort to increase the tax ratio.

2. Literature Review

2.1. Managerial Overconfidence

Someone who involves emotional and psychological factors in making financial decisions may result in bias (Kim et al., 2021). There are two types of bias, including cognitive bias and emotional bias (Pompian, 2012). Mistakes in information processing or reasoning cause cognitive biases, while emotional biases are more concerned with spontaneous thinking or relying on feelings than with the outcomes of mature thoughts. One of the most common emotional biases is overconfidence (Adebambo & Yan, 2018). Several academicians have explored the impact of overconfidence, not only in capital markets but also in corporate finance (Malmendier & Tate, 2015). Baker and Nofsinger (2010) stated that the behavioral finance approach is more significant for corporate finance than capital market investments. Overconfident people tend to overestimate their abilities (Young & Florence, 2019), ignore relevant information (Gigerenzer & Gaissmaier, 2011), and often make flawed decisions (Banerjee et al., 2020). Empirical evidence shows that managerial overconfidence negatively affects firm performance and value (Shah et al., 2018; Kunjal et al., 2021).

2.2. Overconfidence and Tax Aggressiveness

Accounting, taxation, finance, management, and legal literature have all published significant studies on corporate tax aggressiveness. Tax aggressiveness refers to actions to lower taxes that are either illegal, legal, or both (Rachmawati et al., 2020). Intentional tax aggressiveness reduces the firm profit. Consequently, many firms strive to find strategies to decrease taxes (Carrer & Slavov, 2021). Firms can legally reduce tax obligations by applying specific accounting methods, adjusting inventory values, and utilizing debt interest deductions (Duff, 2009).

One of the goals of reducing the tax burden through tax aggressiveness is to obtain higher after-tax income. Tax aggressiveness, on the other hand, has more negative consequences than benefits (Akbari et al., 2019), such as lowering the firm's reputation. There are specifically three reasons why CEOs with overconfidence tend to practice tax aggressiveness. First, they are disposed to underestimate risks while exaggerating the likelihood of profitable outcomes (Jilani & Chouaibi, 2021). However, in fact, the firm must continue to demonstrate good performance from the perspective of shareholders by providing targeted profit. Besides that, CEO overconfidence may overestimate their abilities to do tax planning and believe that tax authorities will not audit them. Therefore, tax aggressiveness will be a viable option. According to Carrer and Slavov (2021), CEOs with overconfidence are inclined to expect more income through various cost-cutting strategies, including paying taxes.

Second, tax aggressiveness lowers the tax burden to support cash flow needs from overinvestments, a trait of overconfidence (Bimo et al., 2019; Sutrisno et al., 2022). Overconfident CEOs often overinvest beyond capacity, relying on tax savings. Third, overconfidence also involves overprecision, causing gaps between projected and actual profits and encouraging earnings management. Tax aggressiveness, as part of earnings management, generates profits while minimizing taxes (Desai & Dharmapala, 2009).

Empirical evidence confirms that overconfident CSOs more likely to engage in tax aggressiveness (Chyz et al., 2019).

H1: CEO overconfidence leads to the practice of tax aggressiveness.

2.3. CEO Overconfidence, Tax Aggressiveness, and CEO Age

Shore et al. (2003) mentioned that age can influence a person's psychology and way of thinking. As CEOs age, they are more likely to shift their perspectives towards tax aggressiveness. Several previous studies have also verified that CEO age positively influences tax aggressiveness (Jiang & Kim, 2022). This is also in line with the Upper Echelon Theory (Hambrick & Mason, 1984) that top managers' individual qualities reflect organizational outcomes through their business strategy choices where the risks are expected to undergo a shift.

Moreover, the CEO age also allows for CEO overconfidence. Several prior studies examined how overconfidence varies with aging (Piehlmaier, 2020). More senior CEOs are associated with extensive expertise (Peni, 2014). Experienced CEOs understand their firms better and are better able to handle internal and external problems (Law & Ningnan, 2022). Individual confidence grows as a result of experience (Ateş et al., 2016). Thus, older CEOs are likely to contribute to the effect of CEO overconfidence on tax aggressiveness.

However, senior CEOs tend to be less overconfident than juniors (Malmendier & Nagel 2011). Overconfidence also declines with age as older individuals become more cautious (Tekçe et al. 2015; Samanez-Larkin et al., 2020). Age reduces risk tolerance (Serfling, 2015), causing CEO views on tax aggressiveness to differ by age. Thus, the interaction between CEO age and overconfidence on tax aggressiveness may be non-linear, with younger CEOs amplifying the effect more than the older ones.

H2: The CEO age strengthens CEO overconfidence to practice tax aggressiveness, although the effects are stronger for the young age group than for the old age group.

2.4. CEO Overconfidence, Tax Aggressiveness, and Firm Size

Additionally, firm size describes the size of a firm (Karlsson, 2021) as defined by the total assets (Natsir & Yusbardini, 2020). It is a significant corporate attribute (Dang & Li, 2018) because firms with high total assets are thought to have better prospects and can generate profits compared to firms with smaller total assets (Chen et al., 2005). Likewise, large firms can boost productivity by making use of economies of scale compared to small firms (Liu et al., 2019). Larger-scale firms are also more competitive than smaller firms since they have a market and thus have more potentials to achieve huge profits (Karlsson, 2021). The large firms also tend to practice tax aggressiveness because they have higher resources and political superiority than the small firms (Hoi et al., 2013). Prior studies have also shown that firm size positively influences tax aggressiveness (Flamini et al., 2021). For these reasons, the firm size can be a qualifying factor that promotes the CEO's overconfidence in implementing a higher level of tax aggressiveness.

Three factors explain the non-linear interaction between firms' size and CEO overconfidence on tax aggressiveness, with the effect weakening in larger firms. First, large firms have better financial access and lower capital costs (Ponikvar et al., 2018; Embong et al., 2012), reducing reliance on tax aggressiveness. Second, larger firms avoid tax aggressiveness to protect their reputation (Kaur & Singh, 2020). Third, larger firms have

greater disclosures (Karim et al., 2013). As a result, the small firms will strengthen the effect of overconfidence on the tax aggressiveness more than the large firms do.

H3: Firm size strengthens CEO overconfidence to practice tax aggressiveness, although the effects are stronger for small firms than large firms

3. Methodology

Data were collected from firm and IDX websites for 2010-2019 to avoid bias, as firms had recovered from the 2008 crisis, while 2020 data were excluded due to COVID-19 impacts and tax policy distortions. The sample includes 59 manufacturing firms listed on IDX, with 590 firm-year observations meeting criteria of active trading, complete financial reports, and reporting in Indonesian currency.

The dependent variable in this study was tax aggressiveness, measured by the effective tax rate (ETR) (tax expense/pre-tax income). If the result was small, it implied that the firm practiced tax aggressiveness. Meanwhile, the independent variable was CEO overconfidence (CO), measured by four proxy variables borrowed from Gao and Han (2020), namely capital expenditure (CAPEX), sales growth (SG), debt ratio (DER), and dividends (DEV). The firm's CAPEX was compared to the industry median; if it was higher than the industry median, the CEO was considered overconfident, and the variable was assigned a value of 1; otherwise, it was assigned a value of 0. Furthermore, if the DER ratio was larger than the industry median, it was assigned a value of 1; otherwise, it was given a value of 0. Meanwhile, the DEV was equivalent to 1 if the corporation did not distribute dividends and 0 if the firm did. The CEO was considered overconfident (CO) if the total r score of the four variables was equal to or more than 2.

In this study, there were two moderating variables, including the manager age (AGE), which referred to the CEO's age as of 2019, and the firm size (FSIZE), which was determined by the total assets (Chen et al., 2024). Meanwhile, the control variables consisted of firm-specific factors such as firm age (FAGE) – which was the age until 2019; the firm profit (ROE) – which was the net income divided by the equity; the firm's operating cash flow (FOCF) – which was the operating cash flow divided by the total assets; the loss (LOSS) – which was a dummy variable with a value of 1 if the firm reported a loss and 0 if otherwise; and the asset turnover (TATO) – which was the sales divided by the total assets.

4. Results/findings

4.1. Descriptive Statistics

Table 1 presents descriptive statistics of the research variables from 590 firms.

Table 1: Descriptive Statistics

Variable	Average	Std. Deviation	Minimum	Maximum	%
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ETR (%)	20.12	15.37	0	96.10	-
CO:					
CO					35%
Non-CO					65%
AGE (year)	55.39	9.16	33	81	-
AGEyoung			33	49	13%
AGEmiddle			50	65	63%
AGEold			66	81	24%
FSIZE (size)	10,872,032	34,821,353	78,200	35,958,000	-
FSIZEsmall			78,200	697,657	29%
FSIZEmedium			702,509	2,999,767	41%
FSIZElarge			3,000,999	35,958,000	30 %
OCF (%)	18.42	25.25	-37.25	167.96	-
FAGE(year)	21.43	5.95	1	37	-
ROE (%)	15.59	22.75	-28.58	143.58	-
LOSS:					
Loss					6%
Profit					94%
TATO	1.26	0.77	0.21	8.43	-

Where ETR is tax aggressiveness, CO is CEO overconfidence, and AGE is the age of the CEO, which is classified into three groups: AGEyoung (under 50 years old), AGEmiddle (50 to 65 years old), and AGEold (over 65 years old). FSIZE is firm size which consists of three categories: FSIZEsmall if the total IDR assets are less than 700,000,000,000, FSIZEmedium if the total assets are between 700,000,000,000 and 3,000,000,000,000, and FSIZElarge if the total assets are greater than 3,000,000,000,000. OCF is the operating cash flow; ROE is return on equity; LOSS is a dummy variable that is assigned a value of 1 if the firm experiences a loss before taxation and a value of 0 otherwise; and TATO is the asset turnover ratio.

The average ETR of manufacturing firms is 20.12%, below the 25% statutory rate (Law No 36/2008)., indicating prevalent tax aggressiveness. Table 1 shows that 35% of managers are overconfident, with an average age of 55, and 63% aged 50-65, reflecting managerial maturity. On average, firms hold IDR 10.88 trillion in assets, dominated by medium-size firms (41%) with assets between IDR 700 billion and 3 trillion.

4.2. Classical Assumption Test

Table 2 shows the results of the classical assumption test for the full model.

Table 2: Results of the Classical Assumption Test

Assumption	Test	Characteristic	Criteria	Conclusion
Normality	Shapiro-Wilk	Sig = 0.07	Sig. > 0.05	Fit

No Heteroscedasticity	Breusch Pagan/ Cook- eisberg	Sig = 0.21		Sig. > 0.05	Fit
No Multicollinearity	Variant Inflation Factor	VIF CO VIF AGE VIF FSIZE VIF OCF VIF FAGE VIF ROE VIF LOSS VIF TATO	=1.64 =1.04 = 1.54 = 3.60 = 4.80 = 3.68 = 1.16 = 3.60	VIF < 5	Fit

4.3. Hypothesis Testing

Prior to hypothesis testing, Chow and Hausman tests confirms the fixed effect model as the best fit, estimating using OLS (Gujarati & Porter, 2009). To improve robustness, we applied cross-sectional weight using FGLS (Brooks, 2014). Table 3 depicts the regression results of the effects of CEO overconfidence on tax aggressiveness. The lower the ETR, the more aggressive the firm is becoming. The results demonstrate that the CO coefficient is both negative and significant. In other words, the higher the level of CEO overconfidence, the lower the ETR or tax aggressiveness. Thus, the first hypothesis can be supported empirically.

Table 3: Estimated Results of the Effects of CO on TA

Dependent Variable: ETR	Model 1		
	β	Z	Sig.
CO	-0.04	-4.58	0.00
Control variables:			
OCF	-0.03	-1.75	0.08
FAGE	-0.003	-4.79	0.00
ROE	0.08	3.43	0.00
LOSS	-0.22	-9.44	0.00
TATO	-0.01	-1.73	0.08
R2	0.16		
Adjusted-R2	0.15		
F-test	18.24		
Sig.	0.00		

Table 4 shows that the CO*AGE interaction coefficient is negative and significant, demonstrating that CEO age enhances the effects of CEO overconfidence on tax aggressiveness. Furthermore, the age variable is divided into three groups (young, medium, and old), aiming to investigate whether there is a shift in the moderating effect at different

age groups. The results reveal that the interaction coefficient of CO*AGEyoung and CO*AGEMiddle is negative and significant. However, CO*AGEold is not. This suggests that there is a moderating effect in the young age group and middle age group but not in the old age group. Therefore, the second hypothesis can be supported empirically. The CEO age strengthens CEO overconfidence to practice tax aggressiveness, although the effects are stronger for the young age group than for the old age group.

Table 4: Estimated Results of the Effects of CO on TA Moderated by CEO Age

Dependent Variable: ETR	Model 2			Model 3		
	β	Z	Sig.	β	Z	Sig.
CO	-0.18	-7.96	0.00	-0.20	-8.71	0.00
CO*AGE	-0.001	-6.05	0.00			
CO*AGEyoung				-0.05	-3.41	0.00
CO*AGEMiddle				-0.07	-4.21	0.00
CO*AGEold				-0.01	-0.13	0.89
Control Variables:						
OCF	-0.02	-1.86	0.06	-0.05	-2.31	0.02
FAGE	-0.003	-3.90	0.00	-0.00	-3.78	0.00
ROE	0.05	2.78	0.01	0.08	3.24	0.00
LOSS	-0.00	-0.71	0.48	-0.01	-1.14	0.26
TATO	0.02	3.68	0.00	0.01	2.32	0.02
R2	0.15			0.13		
Adjusted-R2	0.14			0.12		
F-test	14.21			8.84		
Sig.	0.00			0.00		

Table 5 presents the estimated results of the effects of CEO confidence on tax aggressiveness moderated by firm size. The findings demonstrate that the CO*FSIZE coefficient is significantly negative, which means that the firm size strengthens the effects of CEO overconfidence on tax aggressiveness. In the next test, the firm size is divided into three groups, including small, medium, and large firms, to understand whether there is a shift in the moderating effects between the firm size groups. The coefficient of CO*FSIZEsmall and CO*FSIZEmiddle is negative and significant, but the coefficient of CO*FSIZElarge is not. This demonstrates that the small and medium-sized firms have a moderating effect, whereas the large firms do not. Therefore, we confirmed that the third hypothesis can be supported empirically. It is proven that firm size strengthens CEO overconfidence to practice tax aggressiveness, although the effects are stronger for small firms than large firms.

Table 5: Estimated Results of the Effects of CO on TA Moderated by Firm Size

Dependent Variable: ETR	Model 4			Model 5		
	β	Z	Sig.	β	Z	Sig.
CO	-0.20	-8.61	0.00	0.20	-8.84	0.00
CO*FSIZE	-2.86	-2.27	0.02			

CO*FSIZEsmall				-0.09	-5.37	0.00
CO*FSIZEmiddle				-0.07	-4.45	0.00
CO*FSIZElarge				-0.01	-0.53	0.59
Control Variables:						
OCF	-0.03	-1.67	0.09	-0.05	-2.40	0.02
FAGE	-0.00	-4.71	0.00	-0.03	-3.45	0.00
ROE	0.06	2.90	0.00	0.09	3.57	0.00
LOSS	-0.002	-0.45	0.65	-0.01	-1.79	0.07
TATO	-.003	-1.02	0.31	0.02	-2.90	0.00
R2	0.12			0.16		
Adjusted-R2	0.10			0.14		
F-test	10.81			10.85		
Sig.	0.00			0.00		

5. Discussions

This study aimed to investigate the effect of managerial overconfidence on tax aggressiveness and analyses the role of CEO age and firm size as moderators. The result showed that the first hypothesis was accepted. It is proven that CEOs with overconfidence are more likely to practice tax aggressiveness. CEO overconfidence in manufacturing companies in Indonesia tends to carry out tax aggressiveness as a means of earnings management. As stated by Bimo et al. (2019), the tax aggressiveness was carried out by CEO overconfidence as a strategy due to overinvestment. They were motivated to implement earnings management, one of which was through tax aggressiveness.

The second hypothesis in this study is also supported by data. Our findings underline that CEO age boosts the effects of CEO overconfidence, which leads to the practice of tax aggressiveness. However, the moderating effect of the young age group is stronger than that of the old age group. This supports the relationship between CEO overconfidence and the CEO's age, which is only sometimes linearly related to tax aggressiveness. The older the CEOs, the more cautious and mindful they became about many things, including tax aggressiveness. Older managers tend to be more experienced and confident, including in practicing tax aggressiveness (Chen et al., 2024; Piehlmaier, 2020). However, approaching retirement, their overconfidence bias declines as they become more cautious (Tekçe et al., 2015; Samanez-Larkin et al., 2020), making the moderating effect of older age on the CEO overconfidence-tax aggressiveness relationship weaker than that of younger managers.

The result of this study also show that the third hypothesis was accepted. This finding validates that the firm size strengthens the CEO overconfidence effect on the practice of tax aggressiveness. However, the effect is stronger for small firms than large firms. The firm size variable, like the age variable, has a non-linear relationship with tax aggressiveness. It is because the large firms have more resources to invest, are better at maintaining their reputations, and make more disclosures, thus allowing them to be more cautious with tax issues. Large firms have greater profit potential (Chen et al., 2005), productivity (Liu et al., 2019), and political power (Hoi et al., 2013), encouraging CEO overconfidence in tax

aggressiveness. However, the effect weakens as larger firms prioritize reputation (Ullah et al., 2021), and face greater disclosures demands than the small firms (Karim et al., 2013).

6. Conclusions

This study confirmed that CEOs with overconfidence are more likely to practice tax aggressiveness. Furthermore, the CEO's age and firm size have also been shown to strengthen the effects of CEO overconfidence to practice tax aggressiveness. However, the relationships that occur are not always linear. Moreover, compared to the old CEOs, the young CEOs have demonstrated a greater potential for tax aggressiveness. Meanwhile, small firms tend to practice tax aggressiveness more than large firms.

Theoretically, this study expands tax aggressiveness literature by introducing CEO age and firm size as moderators in the CEO overconfidence-tax aggressiveness relationship. Practically, it urges managers to limit tax aggressiveness by avoiding overconfidence, encourages investors to be cautious with overconfident CEOs, and advises tax authorities to monitor such firms, especially considering CEO age and firm size. This study has two limitations. First, it only considers CEOs, while decision making may involve other executives like CFOs. Second, it assumes dividend omissions result from CEO overconfidence, ignoring possible cash flow constraints. Future studies should address both aspects.

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Bio-note:

Nur Listiani. Alumni of Doctoral Program of Management Science at Faculty of Economics and Business, Satya Wacana Christian University. Completed her Bachelor of Management at STIE AMA Salatiga Indonesia (2018) and obtained her Master of Management (MM) degree from Satya Wacana Christian University, Indonesia (2020). Currently has several publications of articles published in reputable international journals

Supramono. Lecturer at the Faculty of Economics and Business, Satya Wacana Christian University Salatiga (1988). Obtained his Bachelor of Economics degree from Faculty of Economics, Satya Wacana Christian University (1987), Master of Business Administration (M.B.A.) degree from Maastrich School of Management Netherlands (1993), and Doctor of Business Administration (DBA) degree from De La Salle University Manila, Philippines (1999). Currently, he is the Chairman of BeFinances, a study center on behavioral finance . In addition, he is actively involved in managing several scientific journals and research activities that are funded by government and non-government institutions. With regard to scientific publications, many articles have been written and published in several reputable international journals.

Theresia Woro Damayanti. Teaching staff at the Faculty of Economics and Business, Universitas Kristen Satya Wacana Salatiga (2001). Graduated from Faculty of Economics, Satya Wacana Christian University with a Bachelor of Economics (SE) degree in 2002, attended the Accountant (Akt.) professional program at Gadjah Mada University Yogyakarta (2006), obtained a Master of Science (M.Si.) degree from Gadjah Mada University Yogyakarta (2007) and a Doctoral degree from the Accounting Doctoral Program, Brawijaya University, Indonesia (2015). In addition to being active as a consultant in the field of accounting and taxation, he is also involved actively in several research activities that are funded by government and non-government institutions as well as in writing research articles and literature books.

Yeterina Widi Nugrahanti. Lecturer at Faculty of Economics and Business, Universitas Kristen Satya Wacana Salatiga since 2005. Graduated from the Faculty of Economics, Satya Wacana Christian University with a Bachelor of Economics (SE) degree in 2004, attended the accountant (Ak.) professional program at Gadjah Mada University Yogyakarta (2009), obtained a Master of Accounting (M.Acc) degree from Gadjah Mada University Yogyakarta (2010) and a Doctoral degree from the Accounting Science Doctoral Program, Brawijaya

University, Indonesia (2020). His research interests are closely related to financial accounting, corporate social responsibility, and corporate governance. The resulting research articles are published in international and national journals.