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CEO CHARACTERISTICS AND HEDGING DECISIONS: EXAMINING THE MODERATING ROLE OF MANAGERIAL ABILITY

Lidya NURRAHMAWATI

Diponegoro University, Indonesia

Anis CHARIRI

Diponegoro University, Indonesia

Akhmad Samsul ULUM

Pekalongan University, Indonesia

Inayah Risqi ALISA

Gadjah Mada University, Indonesia

Abstract:

Firms with cross-border operations are highly exposed to foreign exchange risk, prompting the need for strategic financial decisions such as hedging. As primary decision-makers, CEOs significantly influence these risk management strategies. This study examines the effect of CEO characteristics—age, education, and work experience—on hedging decisions and evaluates the moderating role of top management team managerial ability in these relationships. Partial Least Squares Structural Equation Modeling (PLS-SEM) is used to test the model. The analysis is based on 91 firm-year observations from energy sector companies listed on the Indonesia Stock Exchange (IDX) during the 2016–2022 period. The results indicate that CEO age and education are positively associated with hedging decisions, while CEO work experience has a negative effect. Notably, managerial ability strengthens the positive influence of CEO age and CEO education on hedging decisions but does not significantly alter the relationship between CEO work experience and hedging.

Key words: CEO age, CEO education, CEO working experience, managerial ability, hedging decision

1. Introduction

Energy sector companies typically operate on a cross-country scale and have production, distribution, or marketing networks spread across several countries (Billah et al., 2024). Energy companies include companies engaged in oil & gas, coal, oil & gas &

coal support, alternative energy equipment, and alternative fuels. These companies include those involved in oil and gas, coal, oil and gas support services, alternative energy equipment, and alternative fuels. Therefore, they face commodity price risks due to trading on the global market, where prices fluctuate significantly, thus facing high foreign exchange risk (Octaviani & Utama, 2022). This occurs because financing processes, as well as a large portion of the company's and its subsidiaries' revenues and operational expenses, are conducted in foreign currencies. Consequently, they face various risks from international trade activities, including foreign exchange exposure (Arinal Mirdha et al., 2023; Hansen & Mowen, 2019). Exchange rate fluctuations can affect future cash flow, known as transaction exposure, which significantly impacts the company's profits (Verawaty et al., 2019). Therefore, transaction exposure is one of the risks arising from exchange rate fluctuations faced by companies. Some cases of corporate failures due to currency fluctuations can be seen in Australia with Qantas Airline (SWAOnline, 2009), Apple in Russia (Bajekal, 2014), and in Indonesia with PT Astra Internasional Tbk (Liliyah, 2018), PT Solusi Bangunan Indonesia Tbk (Wareza, 2019), and PT PLN (Arvirianty, 2018). Therefore, companies must design effective strategies to protect themselves from the risk of losses due to fluctuations in foreign currencies by implementing hedging, which is one of the derivative instruments (Crocì et al., 2024; Kieso et al., 2014). According to Kim et al. (2020), hedging is an action taken by a company to shield itself from exposure to currency exchange rate changes. Hedging also reduces investment or financing risks caused by various macroeconomic factors (Chernenko & Faulkender, 2011; Ourir et al., 2023), as a company's effort to protect itself from greater risks and costs helps to ensure the company's survival (Dudley et al., 2022). On the other hand, Smith & Stulz (1985) state that corporate hedging aims to reduce the financial distress costs arising from bankruptcy.

The issue of hedging decisions is a fascinating phenomenon that has been the subject of research by many scholars. Broadly, the literature review results can be categorized into financial and non-financial factors. There are five financial factors, including ratios of financial performance (Mo et al., 2021; Geyer-Klingenberg et al., 2019; Praveen Bhagawan & Jijo Lukose, 2017; Belkhir & Boubaker, 2013; Arinal Mirdha et al., 2023; Beber & Fabbri, 2012), CEO risk incentives (Crocì et al., 2024; Tai et al., 2014), managerial and CEO (Beber & Fabbri, 2012; Doukas & Mandal, 2018), firm characteristics (Geyer-Klingenberg et al., 2019; Yudha et al., 2023; Nanda et al., 2022; Larasati & Wijaya, 2022), and hedge substitutes (Sprcic & Sevic, 2012). There are 4 non-financial factors, namely CEO characteristics (Beber & Fabbri, 2012; Boubaker et al., 2020; Crocì et al., 2024; Doukas & Mandal, 2018; Entrop & Merkel, 2020), good corporate governance (Geyer-Klingenberg et al., 2019; Hege et al., 2021; Limpaphayom et al., 2019; Sprcic & Sevic, 2012; Tai et al., 2020), managerial utility (Sprcic & Sevic, 2012), and the firm-specific exposure to climate change (Likitapiwat et al., 2023).

One of the interesting determinants in previous research is the CEO's personal characteristics, including CEO age (Crocì et al., 2024), CEO education (Boubaker et al., 2020), and CEO working experience (Beber & Fabbri, 2012; Doukas & Mandal, 2018). This is because the age, education, and experience that an individual possesses and undergoes personally will influence how they perceive situations, evaluate choices, and

ultimately make decisions (Hertwig et al., 2004). Hirshleifer & Thakor (1992) also insist that a person's experience is the main basis for their beliefs and is often the main reason for making decisions. The reason why the personal characteristics of CEOs are seen as an important factor is also claimed by upper echelon theory (Hambrick & Mason, 1984). The theory argues that a company's performance is determined in part by managerial characteristics, past experience, and values.

In fact, studies on the influence of CEO characteristics on hedging decisions provide us with inconsistent findings. Doukas & Mandal (2018) show that there is no significant influence of CEO age on hedging decisions. On the other hand, Beber & Fabbri (2012), Boubaker et al. (2020), Croci et al. (2024), and Entrop & Merkel (2020) find that CEO age has a positive effect on the company's hedging decision. Meanwhile, research on CEO education (Boubaker et al., 2020; Doukas & Mandal, 2018; Entrop & Merkel, 2020) shows results that do not affect hedging decisions. However, a study by Beber & Fabbri (2012) indicates a positive impact of CEO education on hedging decisions. Similarly, differing findings are also found by Doukas & Mandal (2018) regarding CEOs' working experience, which demonstrates a positive influence on hedging decisions. Conversely, Beber & Fabbri (2012) reveal negative results concerning the impact of CEO working experience on hedging decisions.

Baron & Kenny (1986) believe that if the relationship between the dependent and independent variables is weak or inconsistent, there is likely a moderating variable (interaction) that influences the relationship between variables. Therefore, further research is needed to examine the impact of CEO characteristics on hedging decisions by adding a moderating variable, namely managerial ability. This study uses managerial ability as a moderating variable based on the claim by upper echelon theory that managerial ability plays an important role in making decisions, in this case hedging decisions. Managerial ability describes the managers' (top management teams) ability to maximize resources to obtain better performance (Leverty & Grace, 2012). According to Duan et al. (2022), how managers (top management team) utilize company resources, both tangible and intangible assets, efficiently, make sound decisions, and effectively manage the company's operations to generate optimal revenue and enhance the overall value of the company.

A manager possessing strong managerial ability is capable of inspiring and motivating employees, cultivating a constructive organizational culture, and driving higher productivity. Conversely, limited managerial competence may result in suboptimal decision-making, inefficient use of resources, and reduced organizational performance (Zairin et al., 2024). Yung & Chen (2018), in their study, mentioned that managers with better managerial ability are more willing to take risks in managing the company and are related to an increase in company value, whereas managers with low managerial ability tend to avoid taking such risks and are related to a decrease in company value. Ting et al. (2021) stated that a better level of managerial ability can lead to effective decision-making, innovation, and increased investment, resulting in competitive advantages and excellent company performance. Better managerial ability will have an impact on more accurate information compared to low managerial ability (Demerjian et al., 2012). Managers with high ability have superior abilities in identifying growth opportunities,

reducing risks, and adapting to market dynamics, thereby driving superior financial performance (Demerjian et al., 2012). In this context, highly capable managers are also more likely to recognize the strategic importance of hedging as a risk-averse mechanism to mitigate exposure to market volatility, particularly in firms operating across borders or in high-risk sectors. By proactively employing hedging strategies, these managers aim to stabilize cash flows and protect firm value against adverse currency and market movements.

This managerial ability is a new moderating variable in this research. Borrowing from other studies on managerial ability, this research supports the previous finding on the role of managerial ability as a moderating variable. For example, Kim (2021) finds that managerial ability moderates the relationship between managerial overconfidence and going concern audit opinion. Moreover, Kushermanto et al. (2023) use managerial ability as a moderating variable on the relationship between COVID-19 spread and financial distress. The interaction between CEO individual factors such as age, education, and working experience with the managerial ability of the team will yield optimal impacts for the company's interests in hedging decisions. Grounded in upper echelon theory, this study extends the existing literature by providing novel empirical evidence on how managerial ability, an internal capability of the top management team, shapes the strategic financial decisions of firms in the energy sector. To the best of the authors' knowledge, this is the first study to explicitly examine the moderating role of managerial ability in the link between CEO characteristics and hedging decisions within this industry context, thereby offering new insights into executive decision-making dynamics in high-risk sectors.

This study investigates whether CEO-specific attributes, namely age, education, and working experience, significantly influence corporate hedging behavior. Accordingly, the study seeks to answer the following research questions: Does CEO age affect hedging decisions? Does CEO education influence hedging decisions? And does CEO working experience shape the firm's approach to hedging? It is anticipated that older CEOs, due to their greater risk aversion and experience, are more likely to engage in hedging. Likewise, CEOs with higher levels of education are expected to demonstrate stronger financial literacy and decision-making capabilities, making them more inclined toward adopting hedging strategies. CEO working experience is also posited to have a positive effect, as broader exposure to business environments may enhance a CEO's strategic judgment in managing external risks. Furthermore, this study examines whether managerial ability moderates these relationships by enhancing the effectiveness with which CEO characteristics are translated into hedging decisions. Managers with higher ability are better positioned to leverage the strengths of executive leadership. It is therefore hypothesized that managerial ability strengthens the positive effects of CEO age, education, and working experience on hedging decisions. Through this framework, the study offers a more nuanced understanding of how executive traits, when reinforced by strong top management competence, influence firms' strategic financial responses. This study offers practical insights for companies by highlighting how derivative-based hedging decisions are influenced by executive characteristics, providing a reference for managing risks related to exchange rates, interest rates, and commodity prices. For

investors, the findings help clarify the determinants of corporate hedging behavior, thereby supporting more informed investment decision-making.

2. Literature review and hypothesis development

The Upper Echelon Theory introduced by Hambrick & Mason (1984) explains the concept of “Strategic Choice Under Conditions of Bounded Rationality”. The term strategic choice is defined as complex and highly significant decisions that have substantial impacts on organizational performance. Hedging decisions are considered strategic choices aimed at reducing risks. The company's interest in hedging is to smooth out the company's performance in order to stabilize its net income and cash flow (Lonare et al., 2022). Furthermore, according to Herbert & Simon (1990), bounded rationality is a concept in decision-making theory that acknowledges human limitations in gathering and processing information, as well as in making optimal decisions. Initially, a strategic decision-maker (top management) is confronted with various environmental situations within the company. Study by Chen et al. (2024) imply that CEO age alone may not capture the complexity of managerial decision-making. Age might interact with other factors (e.g., overconfidence, tenure, external pressures), which could dilute its standalone impact. The final decision of the manager in responding to these situations depends on the values they believe in, which provide the cognitive basis for strategic choices. Therefore, when managers determine strategic decisions, they are greatly influenced by their values and cognitive biases.

Measuring values and cognitive foundations, which are referred to as the psychological dimension, poses difficulties. Therefore, Hambrick & Mason (1984) emphasize observable managerial characteristics as determinants in strategic decision-making. These managerial characteristics include age, functional track, other career experiences, formal education, socioeconomic roots, financial position, and group heterogeneity. The emphasis on background characteristics rather than psychological dimensions is a fundamental aspect of the upper echelon theory perspective, as managerial background characteristics are easier to observe than their psychological dimensions. Hence, the upper echelon theory states that organizational outcomes can partly be predicted from management backgrounds. The core of this theory lies in the characteristics of the top echelons as determinants of strategic choices, and through these choices, organizational performance is impacted (Hambrick & Mason, 1984).

The upper echelons theory posits that top management characteristics determine strategic choices and, through these choices, impact organizational performance (Hambrick & Mason, 1984). CEO age is one of the most frequently identified and considered characteristics in the upper echelons theory, including in the determination of company decisions to hedge (Malm et al., 2021). The primary role of the CEO is as the decision-maker responsible for signing, enforcing, and reinforcing strategic policies within the company (Doukas & Mandal, 2018). The policy choices made by the CEO are influenced by their personal attributes, including risk preferences such as risk aversion (Page, 2018). The rationale behind this preference is that older CEOs may experience declines in energy and mental stamina, making them less receptive to new ideas.

Therefore, older CEO tend to prefer stability and future certainty (Cid-Aranda & López-Iturriaga, 2023). Additionally, they may have psychological commitments to the organizational status quo and prioritize financial security and career stability (Hambrick & Mason, 1984).

Conversely, younger CEOs tend to be more willing to make risky financial decisions as they seek to prove their skill in trying new things by managing inherent risks (Serfling, 2014). Therefore, older CEOs are more likely to use derivatives as hedging instruments to enhance certainty and minimize random fluctuations in future cash flows of the company (Crocì et al., 2024). Ultimately, hedging can reflect the risk-averse behavior of a CEO, whereby CEOs tend to avoid uncertainty and are reluctant to take risks by choosing hedging instruments with the highest level of planning certainty capable of estimating cash inflows and outflows more accurately over a specific planning period (Crocì et al., 2024). Various studies have been conducted to investigate the influence of CEO age on hedging decision-making. Crocì et al. (2024) find a positive influence of CEO age on a company's hedging usage. Research by Boubaker et al. (2020) demonstrates that CEO age has a positive impact on the increased use of derivative hedging of foreign currencies. Entrop & Merkel (2020) also reveal that CEO age has a positive effect on the use of FX derivatives. Furthermore, Beber & Fabbri (2012) state that CEO age has a positive effect on foreign exchange (FX) hedging. Based on the above arguments, the first hypothesis is proposed as follows:

H1: CEO age has a positive effect on hedging decisions.

According to the upper echelons theory, the CEO's educational background has a significant impact on their abilities and knowledge in leading a company (Hambrick & Mason, 1984). The theory also suggests that the level of educational attainment leads to significant differences in intellectual abilities, cognitive foundations, and values of an individual. Consequently, these differences influence CEOs' assessments in making strategic decisions (Chua et al., 2022). CEOs with higher educational backgrounds are believed to possess effective solutions for complex decision-making tasks, as they are considered to have high cognitive abilities towards innovation (Amran et al., 2014). The type of CEO's high educational background can also influence the manager's use of derivatives and risk-taking appetite because this influences the ability to recognize risky situations and the use of risk reduction techniques (Kiesler & Sproull, 1982). Therefore, a CEO with higher education is likely to make decisions to hedge as part of the company's risk management strategy, aiming to protect the company from unwanted market fluctuations and enhance long-term financial stability. Several studies examine the influence of CEO education on hedging decision-making. Beber & Fabbri (2012) testify to a positive relationship between CEO education and foreign exchange (FX) hedging. Furthermore, Boubaker et al. (2020) also demonstrate that CEO education (level, quality, type) has a positive correlation with the use of hedging. Entrop & Merkel (2020) explain that CEO education positively affects the use of foreign exchange (FX) derivatives. Based on the above arguments, we propose the following hypothesis:

H2: CEO education has a positive influence on hedging decisions.

According to upper echelons theory, experience is one of the CEO characteristics that can influence strategic decision-making (Hambrick & Mason, 1984). Specifically,

CEOs with more experience and skills will have a broader perspective when making strategic decisions for the company. More experienced CEOs tend to evaluate alternative strategies carefully compared to less experienced CEOs because ultimately their decisions will benefit from quality in formulating effective strategies (Chua et al., 2022). For example, CEOs who have worked in various financial industries can assist them in identifying the appropriate financial instruments to protect the company from potential risks, as well as designing hedging strategies that align with the overall goals and needs of the company. Therefore, companies led by experienced CEOs may have more mature and well-planned hedging decisions, which in turn can support the formulation of effective strategies in addressing foreign exchange rate risks. Beber & Fabbri (2012) perform a study that indicates a positive relationship between a CEO's previous work experience and the company's speculative propensity for hedging. Moreover, Doukas & Mandal (2018) attest to a positive influence of CEO working experience on hedging policy. We then propose the following hypothesis:

H3: CEO working experience has a positive influence on hedging decisions.

According to Nielsen (2010), the top management team comprises a combination of top executives such as the CEO, CFO, and other executives, as well as the company's board of directors. Duan et al. (2022) explain that managerial ability is the ability of managers (top management team) to effectively utilize company resources (assets), make appropriate decisions, and efficiently manage the company's operations to achieve optimal revenue and enhance the overall value of the company. This can be observed through the measurement of managerial ability using a two-stage calculation developed by Demerjian et al. (2012). The first stage yields a combined efficiency score, as it still encompasses both company efficiency and managerial efficiency. This score reflects all efforts made by the company and led by the management team, which has the highest authority in decision-making regarding the efficient purchase and utilization of tangible and intangible assets as inputs, then processed into optimal revenue, termed as the company's output. In the second stage, a score (MA score) is produced, where this value reflects managerial ability after eliminating the influence of specific company factors from the combined efficiency. Therefore, the MA score reflects the performance of the top management team beyond individual attributes that may affect CEO characteristics (age, education, and experience) as individuals in strategic decision-making for the company, including hedging decisions.

CEOs are not only influenced by individual characteristics but also by the overall composition of the top management team, which creates a diversity of thinking and generates various strategic alternatives to consider in decision-making (Nielsen, 2010). The interaction between the CEO's individual characteristics and the top management team enables the CEO to think openly, process information effectively, be flexible, and embrace change, thus becoming key to making informed decisions and formulating effective strategies in addressing challenges related to the global market (Herrmann & Datta, 2005). The above arguments lead to the following hypothesis being formulated:

H4: Managerial ability strengthens the relationship between CEO age and hedging decisions.

H5: Managerial ability strengthens the relationship between CEO education and hedging decisions.

H6: Managerial ability strengthens the relationship between CEO working experience and hedging decisions.

3. Methodology

This study analyzes hedging decisions within the population of energy companies listed on the IDX over a 7-year period, from 2016 to 2022. The energy companies referred to in this research include those involved in oil & gas, coal, oil and gas support services, alternative energy equipment, and alternative fuels. Companies in the energy sector are companies whose operations are heavily involved in import-export activities, thus playing a significant role in international trade, and they face commodity price risk because coal, oil, and gas are commodities traded in the global market. Sample selection for this study employed a purposive sampling technique with criteria focusing on energy companies disclosing hedging in their annual reports.

The object of this study is energy sector companies listed on the Indonesia Stock Exchange from 2016 to 2022. The population in this study consists of 13 energy sector companies listed on the Indonesia Stock Exchange for the period of seven years. Utilizing the purposive sampling method, Table 1 describes the study's involvement of 91 observations.

Table 1: Purposive Sampling

No	Explanation	Number of Companies
1	Energy sector companies listed on the Indonesian Stock Exchange	76
2	Energy sector companies that are not listed on the Indonesia Stock Exchange for the 2016-2022 period	(23)
3	Companies that did not publish annual reports with complete required data during 2016-2022	(4)
4	Companies that have never engaged in any form of hedging.	(36)
Number of sample companies		13
Number of observation periods in years		7
Total observation data		91

The definition of a hedging decision is the action taken by top executives to mitigate the risk or potential losses arising from fluctuations in foreign currency exchange rates, interest rates, or commodity prices (Farrugia et al., 2020; Hansen & Mowen, 2019; Kieso et al., 2014). The hedging decision is a dummy variable where companies that carry out hedging activities using derivative instruments will be given a score of 1 and 0 otherwise. This research uses this method to measure the variable, which was conducted by Croci et al. (2024), Limpaphayom et al. (2019), Pangestuti et al. (2020), and Tai et al. (2020).

The CEO's age in this study refers to the age of the company's CEO or managing director, expressed in years (Crocì et al., 2024). The measurement used in this study is a measurement previously done by Beber & Fabbri (2012), Boubaker et al. (2020), Crocì et al. (2024), Entrop & Merkel (2020). They calculated age by referring to the number of years spent by the CEO since their birth. CEO education refers to the history of education pursued by the CEO (Chua et al., 2022). In this study, the calculation of CEO education follows the scaling concept previously employed by Barker & Mueller (2002), Chua et al. (2022), and Zhou & Wang (2014), where a score of 1 is assigned for diplomas, a score of 2 for bachelor's degrees, a score of 3 for professional qualifications, a score of 4 for master's degrees, and a score of 5 for doctorates. CEO working experience indicates the number of companies or industries where the CEO has worked and joined other companies (Doukas & Mandal, 2018). The calculation of CEO working experience in this study involves counting the number of companies where the CEO has worked before joining the current company, as previously conducted by Beber & Fabbri (2012) and Doukas & Mandal (2018).

The moderating variable in this research is managerial ability, where the managers (top management team) effectively utilize company resources such as tangible and intangible assets, make appropriate decisions, and efficiently manage the company's operations to generate optimal revenue and enhance the overall value of the company (Duan et al., 2022). Measurement of managerial ability refers to the two-stage approach developed by Demerjian et al. (2012), which is widely recognized in the literature for isolating the manager-specific component of firm efficiency. This method is adopted to maintain consistency with the original framework proposed by the measurement's originators, ensuring theoretical rigor and comparability with prior empirical studies. The first stage was calculating the firm efficiency with Data Envelopment Analysis (DEA) using MaxDEA 6.1 software. DEA produces a value indicating efficiency scores ranging from 0 (least efficient) to 1 (most efficient), and these scores serve as the basis for calculating the second stage. The calculation of this first stage can be described in the following equation 1:

$$\text{Max } \theta = (\text{sales}) / (\text{CoGS} + \text{SG\&A} + \text{PPE} + \text{OpsLease} + \text{R\&D} + \text{Goodwill} + \text{OtherIntan}) \quad (1)$$

Where:

Sales = amount of total sales

CoGS = amount of cost of goods sold

OpLease = amount of net operating lease

Goodwill = amount of goodwill

OtherIntan = amount of other intangible assets

The second stage was eliminating the company-specific factors from the efficiency scores obtained in the first stage, resulting in the top management team's ability scores by examining the residual values from the regression of company-specific factors. The second stage in calculating managerial ability can be described through the following equation 2:

$$\text{Firm Efficiency} = \alpha + \beta \ln(\text{Total Assets}) + \beta \text{Market Share} + \beta \text{Free Cash Flow Indicator} + \beta \ln(\text{Age}) + \beta \text{Business Segment Concentration} + \beta \text{Foreign Currency Indicator} + \text{Year} + \epsilon \quad (2)$$

Where:

Firm efficiency = efficiency score by DEA

Ln (total assets) = Ln (amount of assets owned by the company)

Market share = Percentage of revenue earned by the company in its industry

Positive Free Cash Flow = Code 1 if the company has positive free cash flow, 0 otherwise

Ln (age) = Ln (number of years the company has been listed on the stock exchange)

Business segment concentration = Proportion of individual business segment sales to total sales

Foreign currency indicator = whether the firm has foreign currency adjustments, 0 otherwise

ε = Residual

The resulting residual values from this second-stage step are referred to as the "top management team ability scores" (MA Score), which will be used to assess the ranking of the top management team's abilities among other companies. The technique employed to test hypotheses in this study is Partial Least Squares-Structural Equation Modeling (PLS-SEM) using WarpPLS version 8.0 software. According to Hair et al. (2019). PLS-SEM is suitable for research aimed at testing theoretical frameworks from a predictive standpoint, as well as for studies based on secondary data and involving financial ratios. Additionally, PLS-SEM does not require normality assumptions and performs well with both small and large sample sizes.

4. Results/findings

The study population consists of 76 energy sector companies, with a sample size of 13 companies observed over 7 years, resulting in 91 observations data points. Table 2 presents the descriptive statistics for each research variable. The average age of the CEO is 55.285 years, indicating that the majority of CEOs are middle-aged. The average CEO working experience across the sample is 4.098, suggesting that most CEOs have relatively little work experience. The average managerial ability score is -0.000000000000009394 with a median of -0.00416946, indicating that the managerial abilities of the selected sample are relatively low. In fact, Kim (2021) argues that firms have high managerial ability if the managerial ability score was higher than the median value.

Table 2: Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Dev.
CEO Age	1	37	78	55.285	8.817
CEO Working Experience	1	0	22	4.098	4.082
Managerial Ability	1	-0.365	0.280	-0.000000000000009394	0.128
Capital Structure	1	0.063	5.976	1.635	1.314
Return on Asset	1	-0.377	0.750	0.139	0.200

Table 3 shows that the majority of the sample is dominated by companies with hedging (82.4%), and the remaining sample is those with nonhedging.

Table 3: Hedging Frequency

Companies	Frequency	Percent	Valid Percent	Cumulative Percent
No Hedging	16	17.6%	17.6%	17.6%
Hedging	75	82.4%	82.4%	100%
Total	91	100%	100%	

Table 4 depicts that the majority of the sample is dominated by companies with CEOs who graduated with bachelor's degrees (53.8%) and master's degrees (33%).

Table 4: CEO Education Frequency

Level of Education	Frequency	Percent	Valid Percent	Cumulative Percent
Bachelor's Degree	49	53.8%	53.8%	53.8%
Master Degree	30	33%	33%	33%
Doctoral Degree	12	13.2%	13.2%	100%
Total	91	100%	100%	

The evaluation of models in PLS-SEM involves two stages: first, the evaluation of the measurement model, and second, the evaluation of the structural model. The evaluation of the measurement model (outer model) is not concluded in this study because it uses observed data. Therefore, this study only performed the structural model. The first step in evaluating the structural model is to assess whether the research model meets the goodness-of-fit criteria. Table 5 shows that the structural model has met all the goodness-of-fit criteria. Therefore, the analysis of the structural model data can be continued with hypothesis testing.

Table 5: Model fit and quality indices

Indicator	Value	Significance	Testing Criteria
Average Path Coefficient (APC)	0.244	$P < 0.001$	$P \leq 0.05$
Average R-Square (ARS)	0.344	$P < 0.001$	$P \leq 0.05$
Average Adjusted R-Square (AARS)	0.271	$P < 0.001$	$P \leq 0.05$
Average Variance Inflation Factor (AVIF)	1.571	-	Ideally ≤ 3.3 Acceptable ≤ 5
Average Full Collinearity VIF (AFVIF)	1.662	-	Ideally ≤ 3.3 Acceptable ≤ 5
Tenenhaus GoF	0.587	-	≥ 0.1 small; ≥ 0.25 medium; ≥ 0.36 large

The next step in evaluating the structural model is to examine the values of R-square and Q²-predictive relevance. Table 6 explains that the Q-squared value of 0.320 being greater than 0 shows that the model has predictive relevance. The R-squared coefficient of 0.344 depicts that 34.4% of the variation in hedging decisions can be explained by CEO age, CEO education, CEO working experience, the moderation of managerial ability, and control variables (capital structure and profitability), while the remaining 65.5% is explained by other variables outside the research model.

Table 6: Coefficient of Determination R-squared and Q-squared

Indicator	Value	Testing Criteria	Explanation
R-squared	0.344	≤ 0.70 strong; ≤ 0.45 moderate; ≤ 0.25 weak	Moderate
Q-squared	0.320	≥ 0.02 weak; ≥ 0.15 moderate; ≥ 0.35 strong Q ² > 0 shows that the model has predictive relevance Q ² < 0 shows that the model lacks predictive relevance	Moderate

The final evaluation of the structural model involves examining the path coefficients and p-values to test the hypothesis. Figure 1 presents the output of the structural equation model (PLS-SEM) using WarpPLS version 8.0. Table 7 shows that the path coefficient for the variable CEO age is 0.210 with a p-value of 0.005, which is significant at the 5% level ($P < 0.05$). Therefore, H1, which states that CEO age has a positive effect on hedging decisions, is supported by this study. The path coefficient for the variable CEO education is 0.117 with a p-value of 0.070, which is significant at the 10% level ($P < 0.10$). Thus, H2, which states that CEO education has a positive effect on hedging decisions, is supported by this study. The path coefficient for the variable CEO work experience is -0.352 with a p-value of < 0.001 , which is significant at the 1% level ($P < 0.01$). Therefore, H3, which states that CEO work experience has a positive effect on hedging decisions, is not supported by this study.

The interaction path coefficient between CEO age and managerial ability is 0.178 with a p-value of 0.013, significant at the 5% level ($P < 0.05$). Therefore, H4, which states that managerial ability strengthens the effect of CEO age on hedging decisions, is supported by this study. The interaction path coefficient between CEO education and managerial ability is 0.136 with a p-value of 0.045, significant at the 5% level ($P < 0.05$). Thus, H5, which states that managerial ability strengthens the effect of CEO education on hedging decisions, is supported by this study. The interaction path coefficient between CEO work experience and managerial ability is -0.196 with a p-value of 0.007, significant at the 1% level ($P < 0.01$). Therefore, H6, which states that managerial ability strengthens the effect of CEO work experience on hedging decisions, is not supported by this study. The path coefficient for the control variable Capital Structure is -0.362 with a p-value of < 0.001 , significant at the 1% level ($P < 0.01$). The path coefficient for the

control variable ROA is -0.408 with a p-value of <0.001, significant at the 1% level ($P < 0.01$).

Figure 1: Results of the structural model

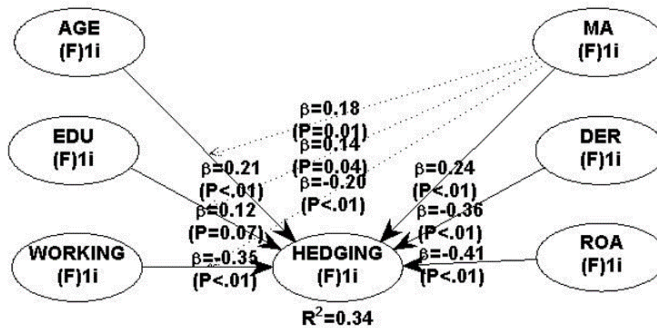


Table 7: Results of hypothesis testing

Structural/hypothesized paths	Parameter (β)	P-value	Conclusion
CEO age → Hedging decision	0.210	0.005**	Supported
CEO education → Hedging decision	0.117	0.070***	Supported
CEO working experience → Hedging decision	-0.352	<0.001*	Not Supported
MA*CEO age → Hedging decision	0.178	0.013**	Supported
MA*CEO education → Hedging decision	0.136	0.045**	Supported
MA*CEO working experience → Hedging decision	-0.196	0.007**	Not Supported
Capital Structure → Hedging decision	-0.362	<0.001*	
ROA → Hedging decision	-0.408	<0.001*	
Notes: *) Significance at 1%, **) Significance at 5%, ***) Significance at 10%			

5. Discussions

The first hypothesis posits that CEO age has a positive effect on hedging decisions. The findings of this study indicate that the empirical data support this hypothesis, so that the CEO getting older, the more likely the company is to make hedging decisions. Hedging decisions are among the strategic decisions of a company; thus, this empirical result aligns with the concept of upper echelon theory, which states that one of the observable managerial characteristics that can determine strategic decision-making in a company is age (Hambrick & Mason, 1984). CEO age significantly influences their interpretation and choices, thereby shaping organizational outcomes. Older CEOs tend to be more competent in their fields and have extensive experience, giving them a significant advantage in managing or avoiding risks more prudently (Malm

et al., 2021). CEOs who are risk-averse tend to favor policies that minimize risk (Bertrand & Mullainathan, 2003). The reason behind this preference is that older CEOs experience a decline in cognitive abilities, including problem-solving or other strategic challenges. This decline has been shown to occur steadily from age 60 to 80 (McCsarthry et al., 2024). The upper echelons theory also suggests that older CEOs may experience a decline in energy and mental stamina, making them less open to new ideas. Additionally, they might have a psychological commitment to the organizational status quo and prefer financial and career security (Hambrick & Mason, 1984). Risk-averse CEOs tend to employ risk management strategies like derivative hedging. This is done to protect the company from fluctuations in exchange rates, interest rates, and commodity prices that could be detrimental in the future. Hedging is a way to reduce unforeseen business risks while still preserving the potential for profit from the company's investments. Thus, with hedging, companies aim to secure themselves against the possibility of significant losses (Pangestuti et al., 2020). The results of this study support the research conducted by Beber & Fabbri (2012), Boubaker et al. (2020), Croci et al. (2024), and Entrop & Merkel (2020). They suggest that CEO age has a positive effect on hedging decisions.

The second hypothesis declared that CEO education has a positive influence on hedging decisions. The finding represents that empirical data support the hypothesis. This attests that the higher the CEO's education level, the greater the likelihood that the company will engage in hedging decisions. This aligns with the upper echelons theory, which suggests that CEOs with higher educational background have a significant impact on their ability and knowledge to lead a company, as the level of education reflects a person's cognitive abilities (Hambrick & Mason, 1984). Therefore, CEOs with higher degrees tend to have superior analytical skills, a broader knowledge base, and better problem-solving abilities, which can positively influence the strategic decision-making process, such as the implementation of effective risk management strategies within the organization. Education can thus serve as a signal of CEO quality, acting as an indicator or marker of their competence, skills, or abilities (Gounopoulos et al., 2020). Furthermore, CEOs with higher degrees are more likely to implement sophisticated, knowledge-based strategies, including the use of hedging derivatives to mitigate risks associated with market fluctuations and exchange rate volatility. This study's findings support the results of two other studies conducted by Beber & Fabbri (2012) and Boubaker et al. (2020). They reveal that CEO education positively influences hedging decisions.

The third hypothesis posits that CEO work experience positively affects hedging decisions. The study's results show that CEO work experience negatively affects hedging decisions; therefore, this hypothesis is not supported by the empirical data. This means that the more work experience a CEO has before joining the current company, the less likely the company is to make hedging decisions. The measurement of hedging in this study uses a dummy variable, where companies that hedge are coded as 1 and those that do not are coded as 0. Separate regression analysis results, not included in this paper, indicate that when testing only the sample of companies that hedge, CEO work experience significantly positively affects hedging decisions. Conversely, in the sample of companies that do not hedge, CEO work experience negatively impacts hedging

decisions. The finding contradicts the upper echelons theory, which suggests that the more experienced the CEO, the more skillful and the wider the perspective when making the firm's strategic decisions. From their perspective, more experienced CEOs are more likely to evaluate the alternative strategies prudently compared to less experienced CEOs (Hambrick & Mason, 1984). The result of this study is consistent with research conducted by Beber & Fabbri (2012), which shows that CEO working experience has a negative effect on a company's likelihood to engage in speculative hedging. Conversely, Doukas & Mandal (2018) reveal that there is a positive effect between CEO working experience and hedging decisions.

The fourth hypothesis expressed that managerial ability strengthens the relationship between CEO age and hedging decisions. The finding represents that empirical data support the hypothesis. This attests that better managerial ability amplifies the influence of CEO age on a company's hedging decision. According to Nielsen (2010), the top management team consists of senior executives such as the CEO and CFO, as well as board members. Duan et al. (2022) define managerial ability as the skill of the top management team to use company resources effectively to achieve optimal revenue and increase company value.. Therefore, better managerial ability is crucial for a company's success. The concept of managerial ability (top management team) aligns with the upper echelons theory, which explains that top management plays a role in determining strategic decisions within the company and how managers interpret and manage complex situations (Hambrick & Mason, 1984). Companies with better managerial ability can support CEOs in leveraging their experience and insights to make more strategic decisions regarding the use of derivatives and other financial instruments for risk management. CEOs above the age of 60 typically face limitations in generating new ideas and a decline in stamina, which often leads them to opt for risk-averse strategies such as hedging to mitigate potential risks to the company. Thus, companies led by older CEOs with strong managerial skills are more likely to be better prepared and effective in implementing hedging strategies, thereby reducing exposure to market fluctuations and revenue volatility. Nielsen (2010) also suggests that cooperation across the entire top management team is crucial, as it fosters diverse thinking and generates a variety of strategic alternatives for decision-making. Consequently, this can positively impact a company's stability and growth, as well as increase investor confidence in the company's ability to navigate future uncertainties.

Yung & Chen (2018), in their study, mentioned that managers with better managerial ability are more willing to take risks in managing the company and are related to an increase in company value, whereas managers with low managerial ability tend to avoid taking such risks and are related to a decrease in company value. Ting et al. (2021) stated that a better level of managerial ability can lead to effective decision-making, innovation, and increased investment, resulting in competitive advantages and good company performance. Better managerial ability will have an impact on more accurate information compared to low managerial ability (Demerjian et al., 2012). Companies with a top management team possessing strong managerial ability can support CEOs who exhibit maturity in decision-making (as indicated by increasing age) possess high cognitive insights and capabilities (reflected in their level of education) to recognize risky

situations, use risk mitigation techniques, and provide effective solutions to complex decision-making in hedging. Therefore, the fifth hypothesis, stating that managerial ability strengthens the influence of CEO education on hedging decisions, is supported by empirical data in this study. According to King et al. (2016), education reflects an individual's cognitive abilities or "IQ" (intelligent quotient). So, the conclusion is better managerial ability leads to preferable risk management, innovation, and accurate decision-making. Additionally, higher education reflects cognitive abilities and IQ, which are associated with better strategic thinking and quicker decision-making. Therefore, CEOs with higher education and better managerial ability are more equipped to make informed and effective hedging decisions.

The sixth hypothesis, which posits that managerial ability strengthens the influence of CEO work experience on hedging decisions, is not supported by the empirical data in this study. However, based on empirical data, managerial ability actually weakens the influence of CEO work experience on hedging decisions. In other words, managerial ability does not moderate the relationship between CEO working experience on hedging decisions. This is due to the fact that the average managerial ability is relatively low, at just -0.0000000000000009394. This contradicts the upper echelons theory, which explains that processes and strategies within the company are related to the involvement of individuals who have a position at the top management level. Top management has a role in determining strategic decisions in the company and how managers' ability to interpret and manage complex situations (Hambrick & Mason, 1984). Although the upper echelons state that processes and strategies within a company are linked to the involvement of individuals at the top management level, this study finds that better capabilities of the top management team actually do not moderate the relationship between CEO working experience and hedging decisions.

6. Conclusions

This study finds empirical evidence that older CEOs tend to avoid uncertainty and are reluctant to take risks by choosing hedging instruments with the highest planning certainty, capable of more accurately forecasting cash inflows and outflows during specific planning periods. This suggests that as the CEO's age increases, the likelihood of the CEO engaging in hedging activities also increases. Furthermore, CEOs with higher education can implement effective risk management strategies in strategic decision-making (hedging) due to their high levels of analytical skills and cognitive abilities for better problem-solving. This indicates that higher levels of education among CEOs correlate with a greater probability of the CEO engaging in hedging. However, CEOs with extensive prior work experience across different companies tend not to make hedging decisions. CEO working experience has a negative effect on hedging decisions, which implies that the more work experience a CEO has from previous companies, the less likely they are to engage in hedging.

These findings indicate that managerial ability plays a significant moderating role in shaping the relationship between certain CEO characteristics and corporate hedging decisions. Specifically, the influence of CEO age on hedging decisions is amplified in firms with higher managerial ability, suggesting that experienced leadership coupled with

strong managerial competence enhances strategic risk management. Similarly, managerial ability strengthens the positive association between CEO educational background and hedging practices, implying that education-driven decision-making becomes more effective in the presence of capable management. In contrast, the study finds no evidence that managerial ability moderates the relationship between CEO work experience and hedging decisions, suggesting that prior professional tenure alone may not interact meaningfully with managerial competence in influencing hedging behavior. Improved managerial ability at the top management level can strengthen hedging decisions in reducing market fluctuation risks and exchange rate volatility for CEOs who prioritize stability and certainty in future outcomes, have psychological commitment to the status quo, prioritize financial security and career stability, are competent in their field, possess superior analytical skills, and have a broader knowledge base. However, it tends to weaken hedging decisions for CEOs with broader work experience.

The limitation of this study lies in the measurement of the hedging variable, which was operationalized using a dummy variable. This approach was necessitated by data constraints, particularly due to the availability of hedging-related figures in physical units (e.g., barrels for oil) rather than in monetary terms and the limited access to detailed currency-denominated data through the Indonesia Stock Exchange (IDX). Consequently, this may limit the precision with which hedging intensity and financial exposure are captured. Future research is encouraged to employ more granular hedging data where available, particularly from jurisdictions or databases that provide monetary values of hedged transactions. Researchers could enhance the robustness of hedging variable measurement by incorporating the nominal amounts involved and specifying the types of derivative instruments utilized. Such refinement would allow for a more nuanced analysis of the effectiveness and strategic implications of corporate hedging practices.

7. References

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