Accounting Analysis Journal

https://journal.unnes.ac.id/journals/index.php/aaj

CEO Demographics and Corporate Cash Holdings: Evidence from Banking Companies in Indonesia

Amrie Firmansyah [1]✉ and Nafis Dwi Kartiko [2]

[1]*Faculty of Economics and Business, Universitas Pembangunan Nasional Veteran Jakarta, Indonesia*
[2]*Directorate General of Tax, Ministry of Finance, Indonesia*

ARTICLE INFO

Article History:
Submitted December 15th, 2024
Revised February 3rd, 2025
Accepted April 29th, 2025
Published May 5th, 2025

Keywords:
CEO Demographics; Cash Holdings; Banking Industry; Firm Size; Corporate Governance

ABSTRACT

Purpose : The study examines the impact of CEO demographics on corporate cash holdings in the Indonesian banking industry, focusing on CEO tenure, age, education, and gender. The study considers how regulatory constraints, firm characteristics, and macroeconomic factors shape corporate liquidity decisions.
Method : Using data from 46 banking companies listed on the Indonesia Stock Exchange (IDX) from 2004 to 2022, this study analyzes 637 firm-year observations. The Ordinary Least Squares (OLS) regression model assesses the relationship between CEO demographics and cash holdings, incorporating firm-specific and macroeconomic control variables such as firm size, leverage, working capital, inflation, and GDP growth.
Findings : The result reveals that CEO tenure negatively affects corporate cash holdings, suggesting that longer-tenured CEOs may optimize liquidity management rather than hold excess cash. CEO education positively influences cash holding, reflecting a stronger understanding of financial management and risk mitigation. In contrast, CEO age shows an insignificant effect, implying that experience and strategic priorities may matter more than age alone. Female CEOs exhibit a negative influence on cash holdings, possibly due to a more cautious financial approach or external governance expectations.
Novelty : The study contributes to the literature on corporate liquidity by integrating CEO demographic factors with firm-specific and macroeconomic contexts. It extends the application of the upper echelons theory in a highly regulated sector, demonstrating how leadership traits influence cash management decisions. The research offers valuable insights for regulators, investors, and corporate boards in evaluating CEO profiles when assessing financial policies and risk management strategies.

INTRODUCTION

Corporate cash holdings play a crucial role in financial management, serving as a liquidity buffer that enables firms to navigate economic uncertainties and capitalize on investment opportunities (Alnori, 2020; Feng et al., 2022). Adequate cash reserves provide financial flexibility, reducing reliance on external financing, which may be costly and impose unfavorable terms (Dimitropoulos et al., 2020; Nylund et al., 2020). Firms with sufficient cash holdings can mitigate financial distress, absorb unexpected economic shocks, and respond swiftly to market dynamics, enhancing their long-term sustainability and competitive advantage (Hapsari & Norris, 2022; Li et al., 2023; Schroeder & Kacem, 2020). Consequently, corporate cash management has become an essential strategic decision that firms must optimize to balance liquidity needs and investment opportunities (Chada & Varadharajan, 2023; Houqe et al., 2023).

Given its strategic importance, cash management decisions are significantly influenced by top executives, particularly the Chief Executive Officer (CEO). As the highest-ranking executive in a firm, the CEO is responsible for shaping financial policies, including determining optimal cash reserves, investment strategies, and risk management practices (Gill & Shah, 2012; Kusumawardani et al., 2021). The CEO and the board's decisions include crucial aspects such as determining the optimal amount of cash reserves, investment strategies, and managing financial risks (Kirkpatrick, 2009; McNulty et al., 2013). These strategic measures ensure the company has sufficient liquidity to

* *E-mail: amriefirmansyah@upnvj.ac.id*
Address: Jln. RS Fatmawati, Pondok Labu, Jakarta Selatan 12450, Indonesia

DOI 10.15294/aaj.v13i3.17826 p-ISSN 2252-6765 e-ISSN 2502-6216

respond to changing market conditions and capitalize on emerging opportunities. Correspondingly, an effective cash management policy can ensure the company's financial stability, reduce the need for costly external financing, and enhance the company's ability to withstand economic crises (Chang & Yang, 2022; Gao, 2015; Pinkowitz et al., 2006). Furthermore, the CEO's actions and decisions regarding cash holdings directly impact the firm's cash reserves. Adequate cash reserves are crucial for financial stability and maintaining operational continuity during economic fluctuations. Efficient cash management also increases operational flexibility, enabling the firm to respond to market changes and make timely investment decisions.

The characteristics of a CEO have a significant impact on a firm's cash holdings (Aktas et al., 2019; Belkhir et al., 2018; Elnahas et al., 2023; W. Huang et al., 2015; T. N. Le, 2022; Loi et al., 2023; Tong, 2010). Several studies have investigated how various CEO attributes affect the firm's cash reserve level. These studies have identified CEO tenure, excess confidence, cultural background, risk incentives, CEO succession, and debt incentives as critical factors influencing cash management decisions (Aktas et al., 2019; Belkhir et al., 2018; Cambrea et al., 2020; Elnahas et al., 2023; Hapsari & Norris, 2022; Hassanein & Kokel, 2019; W. Huang et al., 2015; T. N. Le, 2022; Loi et al., 2023; Magerakis & Habib, 2021; Suherman et al., 2021; Tong, 2010; Zhao & Ma, 2017). Chen (2008) found a link between CEO tenure and cash holdings. CEOs with longer tenure tend to focus on long-term performance objectives, resulting in lower cash reserves than those with shorter tenure. Moreover, CEO overconfidence affects the motivation to hold cash (Aktas et al., 2019; Chen et al., 2020). Optimistic CEOs have different objectives for holding cash compared to non-optimistic CEOs. This effect may result in higher cash reserves, particularly in financially constrained firms with high growth opportunities (Aktas et al., 2019). The cultural background of a CEO can impact cash holdings, mainly when power is concentrated among top executives and information asymmetry is high (Loi et al., 2023). Additionally, CEO risk incentives are linked to cash holdings, with risk-averse CEOs allocating more assets to cash holdings to reduce firm risk, potentially at the expense of risky projects with positive net present values (Tong, 2010). Moreover, studies have examined CEO succession and cash holdings. New CEOs may alleviate financial constraints by reducing previous investment programs to fund future investments, which can influence cash management decisions(Zhao & Ma, 2017). Additionally, debt incentives for CEOs have been found to impact the value of excess cash, highlighting the conflict between shareholders and debt holders in shaping corporate cash policy and valuation (Belkhir et al., 2018). In addition, research suggests that gender diversity in executive positions, especially at the director level, may influence corporate decisions regarding cash holdings. According to Cambrea et al. (2020), women in executive leadership positions, particularly as directors, may have a distinct role in overseeing and making decisions about cash holdings compared to other executive roles.

The main objective of this study is to investigate CEO demographics' impact on cash holdings in the banking industry. The CEO demographics used in this study are CEO tenure, CEO age, CEO education, and CEO gender. The choice of the banking industry as the focus of the study is due to its unique characteristics, particularly regulations, risks, and capital structure (Armstrong, 2011). The banking industry is an ideal environment to test how much the CEO's personal and professional characteristics can influence crucial financial decisions, such as cash holding management. This study proposes assessing how much influence varies depending on the age and size of the banking firms studied. In the literature review on the effect of firm characteristics on cash holdings, various studies have shown mixed results. Ullah & Kamal (2017) identified statistical variation concerning cash holdings between large and small firms. The empirical results show that the coefficient of board size in large firms is positively related to cash holdings, signaling that firm cash holdings increase as board size increases. Meanwhile, for smaller firms, corporate governance positively affects cash holdings. Subramaniam et al. (2011) conclude that, although less specific in their framework, confirm that cash holdings positively affect cash holdings, indicating the importance of liquidity as a strategic asset in the company's operations. Magerakis et al. (2020) add that higher cash levels are found in companies with riskier cash flows, more growth opportunities, and higher R&D expenditures. Conversely, a company's cash holdings decrease when there are cash substitutes, cash flows, and increased capital expenditures. The study also shows that small-sized firms tend to hold more cash than larger firms due to precautionary motives. It is essential to consider that firms of varying ages and sizes may have distinct risk and liquidity management strategies, which can be influenced by the CEO's leadership approach and strategic decisions. The study aimed to identify patterns or trends that may need to be evident in a more generalized and homogeneous study.

This study makes a significant theoretical and empirical contribution to the literature on corporate cash holdings by integrating upper echelons theory with the unique dynamics of the banking industry. Theoretically, this study extends the application of upper echelons theory by examining how CEO demographics (tenure, age, education, and gender) influence liquidity management in a highly regulated financial sector. While prior research on CEO characteristics and cash holdings has predominantly examined non-financial firms (Mun et al., 2020; Zhou et al., 2021), studies focusing on banking firms remain limited. Given the stringent capital adequacy and liquidity requirements in the banking sector, the role of CEO demographics in shaping cash management strategies is likely to differ from that in non-financial firms. This study addresses this gap by providing empirical evidence on how CEO tenure, age, education, and gender influence cash holdings in banks, taking into account regulatory constraints and firm-specific characteristics. Given that prior research has yielded varied findings regarding CEO influence on liquidity decisions, this study helps clarify how leadership traits interact with external regulatory constraints and

firm-specific characteristics to shape corporate financial strategies.

From an empirical perspective, this study fills a research gap by analyzing the impact of CEO characteristics, specifically in the banking sector. Liquidity management is critical for financial stability and regulatory compliance in this industry. By focusing on banks listed on the stock exchange, this study provides valuable insights into how CEO demographics shape strategic cash decisions under financial regulations and market expectations.

From a practical perspective, the findings of this study are highly relevant to stakeholders in the banking industry, including regulators, banking managers, and investors. The study provides insights into how CEO characteristics influence cash management decisions, which are essential in strategic planning and financial decision-making. This may assist banking firms in devising more effective cash management strategies, given the critical role cash plays in maintaining liquidity and financial stability. In addition, these findings can be considered for boards of directors when selecting and assessing CEO performance, considering the impact of leadership on corporate financial policies.

When applied to cash management, upper echelons theory explains how top executives' characteristics, beliefs, and cognitive biases shape corporate financial decisions, including liquidity policies (Hambrick & Mason, 1984). Orens & Reheul (2013) emphasize that CEO demographics are crucial in shaping financial strategies and influencing corporate cash holdings. According to this theory, a CEO's background, experience, and leadership style impact their perception of financial risks and strategic cash management decisions (Zhang et al., 2022). Upper echelons theory suggests that strategic financial decisions reflect the cognitive frameworks and leadership approaches of top executives (Jiang & Kim, 2022). Additionally, CEO characteristics have been linked to corporate financial decision-making, demonstrating that leadership attributes influence corporate cash management strategies (Muien et al., 2022).

CEO tenure is crucial in shaping cash-holding strategies in corporate liquidity management. CEOs with longer tenure accumulate extensive industry knowledge, stronger investor relationships, and enhanced financial expertise, which may lead to more conservative liquidity management approaches (J. Xu et al., 2019). Shi et al. (2018) argue that long-tenured CEOs prioritize financial stability, holding higher cash reserves as a precaution against economic uncertainties. CEOs who have led firms for extended periods often develop a preference for maintaining liquidity buffers, ensuring financial flexibility to support long-term strategic planning (Egerová & Nosková, 2019).

Several studies support the positive association between CEO tenure and corporate cash holdings, reinforcing that experienced CEOs favor higher liquidity retention. Kariuki et al. (2015) find that longer CEO tenure strengthens corporate liquidity strategies, particularly in firms with high-growth potential and market uncertainties. Similarly, Lee & Lim (2021) report that firms with long-tenured CEOs tend to maintain higher cash reserves to mitigate financial risks and enhance stability, especially when there are volatile external financing conditions.

Ariff et al. (2022) also suggest that leadership tenure influences corporate financial policies, particularly in regulated industries. In the banking sector, longer-serving CEOs may maintain higher cash reserves to comply with regulatory liquidity requirements and ensure resilience against market fluctuations. These findings indicate that CEO tenure contributes to a company's financial preparedness, reinforcing the tendency to hold excess liquidity. Based on upper echelons theory and supporting empirical evidence, longer CEO tenure is likely associated with higher corporate cash holdings, as experienced CEOs prioritize financial stability, regulatory compliance, and liquidity management efficiency.

H_1: CEO Tenure has a positive impact on corporate cash holdings

The upper echelons theory posits that top executives' demographic characteristics, experiences, and cognitive biases shape organizational decisions and strategies (Hambrick & Mason, 1984). This theory emphasizes that CEOs' age influences risk perception, strategic decision-making, financial policies, and corporate cash management. As executives age, they accumulate industry knowledge, refine their decision-making frameworks, and develop leadership styles prioritizing stability and risk aversion. These characteristics directly affect how CEOs approach liquidity management and cash-holding policies. In corporate cash management, the CEO age is expected to influence financial decision-making by gradually shifting toward conservative strategies. Having experienced multiple economic cycles and financial crises, older CEOs may perceive cash holdings as a necessary financial buffer to navigate uncertainties. Consequently, they may be more inclined to hold higher cash levels to ensure corporate stability and financial flexibility.

Empirical research supports the positive association between CEO age and corporate cash holdings, reinforcing that older CEOs prefer maintaining higher liquidity levels to mitigate financial risks. Yeoh & Hooy (2022) found a positive relationship between CEO age and corporate cash holdings, suggesting that older executives prioritize financial stability over aggressive investment strategies. Their findings indicate that this effect weakens firms operating in more developed financial markets, where external financing is more accessible.

Additionally, Gupta (2022) found that older CEOs reduce ICFS, meaning they are less likely to allocate cash aggressively toward investments. This suggests that older executives prefer to retain liquidity rather than deploy cash in high-risk projects. Similarly, Belenzon et al. (2019) found that firms led by older CEOs tend to adopt more conservative business strategies, including lower investment levels and slower sales growth, further reinforcing that

increased CEO age is associated with a preference for financial security through higher cash holdings.

Furthermore, H.-W. Huang et al., (2012) found that older CEOs are associated with higher financial reporting quality, implying a more cautious and structured approach to financial management, which likely extends to conservative liquidity management strategies. Serfling (2014) also demonstrated that older CEOs invest less in high-risk projects such as research and development or acquisitions, instead focusing on financial prudence and stable cash reserves. These studies collectively suggest that CEO age is crucial in shaping corporate liquidity decisions through a risk-averse approach. Based on upper echelons theory and supporting empirical evidence, it is expected that CEO age has a positive effect on corporate cash holdings, as older CEOs adopt more conservative financial strategies, prioritize liquidity buffers, and reduce risky investments.

H_2: CEO Age has a positive impact on corporate cash holdings

The upper echelons theory explains how top executives' demographic characteristics, experiences, and cognitive biases shape corporate strategic decisions (Hambrick & Mason, 1984), including financial policies such as corporate cash management. The theory posits that a CEO's education influences their leadership style, decision-making approach, and risk perception, ultimately affecting how they manage liquidity and financial reserves. Education provides executives with analytical skills, financial knowledge, and strategic vision, which may lead to a more structured and risk-aware approach to cash management. In the context of corporate liquidity decisions, CEO education is expected to influence financial policies by enhancing financial expertise, improving access to external funding, and strengthening corporate governance. Highly educated CEOs prioritize financial flexibility and long-term stability, which may lead to higher cash retention strategies.

Empirical studies support the positive association between CEO education and corporate cash holdings, suggesting that higher education levels contribute to more cautious and strategic liquidity management. Mun et al. (2020) found that a CEO's educational background significantly influences cash-holding policies, with firms led by CEOs holding advanced degrees maintaining higher levels of excess cash. This suggests that higher education enhances financial decision-making, leading to more prudent cash retention policies.

Similarly, Boubaker et al. (2020) demonstrated a positive relationship between elite education and corporate hedging decisions, indicating that high-quality education strengthens a CEO's ability to manage financial risks, including liquidity management. Saidu (2019) further, CEO education positively affects firm profitability, implying that better-educated CEOs make more informed and strategic financial decisions, which likely include prudent cash-holding practices. Additionally, Ghardallou (2022) highlighted that CEO education positively influences corporate financial sustainability, reinforcing that CEOs with higher education levels are more likely to implement financial policies prioritizing stability and resilience. The study suggests that well-educated CEOs retain liquidity buffers to mitigate financial uncertainties.

Further supporting this perspective, Zhou et al. (2021) found that CEO education promotes corporate innovation and environmental responsibility, indicating that CEOs with strong academic backgrounds tend to engage in long-term strategic financial planning, which includes maintaining adequate liquidity for future growth initiatives. Rao et al. (2024) also emphasized the role of CEO knowledge integration in fostering corporate innovation, highlighting that CEOs with diverse educational backgrounds leverage their expertise to enhance strategic decision-making, including cash management strategies. Based on upper echelons theory and supporting empirical evidence, it is expected that CEO education has a positive effect on corporate cash holdings, as highly educated CEOs adopt more structured financial strategies, prioritize liquidity buffers, and enhance risk management practices.

H_3: CEO Education has a positive impact on corporate cash holdings

The upper echelons theory posits that the demographic characteristics, cognitive biases, and leadership styles of top executives shape organizational decisions and strategies (Hambrick & Mason, 1984). Gender, as a key demographic characteristic, influences decision-making approaches, risk preferences, and corporate financial policies, including cash management strategies. Female CEOs, influenced by risk aversion tendencies and precautionary motives, may adopt more conservative financial policies, leading to higher corporate cash holdings. In corporate cash management, female CEOs are expected to be more cautious in liquidity decisions, prioritizing financial stability and risk mitigation over aggressive investment strategies. Their leadership approach may lead to higher cash retention as a safeguard against financial uncertainty and a greater emphasis on ensuring corporate liquidity resilience.

Empirical studies support the positive association between female CEOs and corporate cash holdings, suggesting that women in executive roles adopt a more conservative approach to liquidity management. Zeng & Wang (2015) found that female CEOs in Chinese non-SOEs tend to hold higher cash levels, emphasizing their strong precautionary motives and lower tendency toward over-investment. Similarly, Cambrea et al. (2020) confirmed that firms managed by female CEOs maintain more extensive cash reserves, reinforcing that women in executive roles prioritize financial prudence and cash preservation.

Further evidence from Sah (2021) highlights that female CEOs are more risk-averse, leading them to retain higher cash reserves and reverse cash deficits faster than their male counterparts. This study also indicates that female-led firms are more likely to use excess cash to increase dividends rather than engage in riskier investments,

Table 1. Operationalization of Variables

Variable	Operationalization
Independent Variables	
CEO Tenure (CEOTEN)	Measured using the natural logarithm of CEO tenure length to reflect experience and stability in leadership (Ariff et al., 2022; Kariuki et al., 2015; Lee & Lim, 2021; J. Lim & Lee, 2019).
CEO Age (CEOAGE)	CEO age is also calculated using the natural logarithm of CEO age, reflecting life experience and possible conservatism in decision-making (Gupta, 2022; H.-W. Huang et al., 2012; Serfling, 2014; Yim, 2013).
CEO Educational Background (CEOEDU)	CEO educational background is measured by the natural logarithm of the education level dummy variable plus 1. The dummy variable uses a scale from 0 for bachelor's to 3 for doctoral (0 = for CEO education below bachelor's level, 1 = for CEO education at bachelor's level, 2 = for CEO education at master's level, 3 = for CEO education at doctoral level), which signifies the level of formal education that can influence strategic perspectives and decisions (Boubaker et al., 2020; Mun et al., 2020; Rao et al., 2024; Zhou et al., 2021)
CEO Gender (CEOGEN)	CEO gender (CEOGEN) is identified with a dummy variable, where 1 indicates female and 0 indicates male, to examine the influence of gender in corporate financial management (Atif et al., 2019; Cambrea et al., 2020; Doan & Iskandar-Datta, 2020; Zeng & Wang, 2015).
Dependent Variables	
Cash Holdings (CASHNA and LNCASHNA)	The proportion of cash and cash equivalents to total net assets (CASHNA) and the natural logarithm of the ratio (LNCASHNA) provide a more in-depth view of the cash position adjusted for liabilities (Hu et al., 2019).
Control Variable	
Firm Size (FSIZE)	Firm-level control variables include firm size, which is measured as the natural logarithm of the firm's total assets, to assess the impact of the scale of operations on financial decisions (Bose et al., 2018).
Firm Age (FAGE)	Firm age is calculated as the natural logarithm of the number of years since the firm was founded, reflecting experience and possible evolution of financial strategies (Bose et al., 2018).
Return on Equity (ROE)	Return on equity, calculated as pre-tax income divided by total equity, assesses the firm's effectiveness in generating profits from invested equity (Yoon et al., 2021).
Leverage (LEV)	Leverage is the ratio of total debt to total assets, which indicates the degree of debt utilization in financing the company's assets (Hu et al., 2019).
Net Working Capital (WC)	Net working capital is calculated as the difference between current assets and current liabilities, excluding cash and cash equivalents, scaled by total assets, reflecting the company's ability to meet its short-term obligations (Hu et al., 2019).
Inflation Rate (INF)	GDP per capita growth (annual %) (T. D. Le & Ngo, 2020; Petria et al., 2015).
GDP Growth (GDPGR)	Inflation, GDP deflator (annual %) (T. D. Le & Ngo, 2020; Petria et al., 2015).

demonstrating a structured approach to cash management. Additionally, X. Xu et al. (2019) found that firms with female CFOs also exhibit higher cash reserves, reinforcing that female executives, regardless of role, emphasize financial security through conservative liquidity management. This finding is aligned with the broader argument that women in financial leadership roles contribute to risk-averse financial decision-making, leading to higher corporate cash holdings.

Tosun et al. (2022) further support the precautionary savings-based explanation and found that female directors play a role in moderating the risk-taking behavior of overconfident CEOs, ensuring that corporate cash policies remain balanced and do not excessively deplete liquidity. While board-level gender diversity may not always directly affect cash holdings, the presence of female executives, particularly in CEO roles, is linked to a greater emphasis on liquidity preservation. Based on upper echelons theory and supporting empirical evidence, it is expected that female CEOs will have a positive effect on corporate cash holdings, as they tend to prioritize financial security, maintain liquidity buffers, and adopt more conservative cash management strategies.

H_4: Female CEO has a significant positive impact on corporate cash holdings

RESEARCH METHODS

In this study, we focus on collecting and analyzing data from banks listed on the Indonesia Stock Exchange as the main sample. 46 banking companies are the subject of this study, covering the period from 2004 to 2022, which gives a total of 637 observations. Relevant financial data for this study, including information related to independent, dependent, and firm-level control variables, are obtained from the financial statements, the Indonesia Stock Exchange website, and the annual reports of each relevant company. Furthermore, CEO demographic variables, which fall under the category of independent variables of this study, were collected from the Indonesia Stock Exchange website, related company websites, and company annual reports. Country-level control variables, which play a role in the analysis to identify external influences on corporate cash holdings policy, are obtained from the websites of the Indonesian Central Bureau of Statistics and the World Bank. These variables include macroeconomic data such as inflation and GDP growth, which allows this study to consider macroeconomic conditions as a factor that could influence management decisions regarding cash holdings. A brief operationalization of the variables is shown in Table 1.

To investigate the effect of CEO demographics on cash holdings, this study designs an econometric model that considers dependent, independent, and control variables. As independent variables, this study focuses on CEO tenure (CEOTEN), CEO age (CEOAGE), CEO educational background (CEOEDU), and CEO gender (CEOGEN), which are hypothesized to have a significant positive influence on a firm's cash-holding policy. The dependent variables in this study include two cash holdings proxies: the proportion of cash and cash equivalents to total net assets (CASHNA) and the natural logarithm of the ratio (LNCASHNA). The determination of the dependent variable aims to provide a robust model. The variable $\varphi_{i,d}$ is a control variable consisting of firm-level control variables and country-level control variables. The firm-level factors such as firm size (FSIZE), firm age (FAGE), return on equity (ROE), leverage (LEV), and net working capital (WC), as well as country-level factors including inflation rate (INF) and GDP growth (GDPGR). These two variables provide the macroeconomic context influencing a firm's cash holdings policy. These variables are operationalized to understand in depth how individual CEO characteristics and firm conditions, as well as the external environment, affect a firm's cash holdings strategy.

The econometric model used in this study is the Ordinary Least Squares (OLS) model, which was chosen for its ability to assess the linear relationship between the research variables. This study conducted a multicollinearity test to ensure the model was free from multicollinearity problems by looking at the variance inflation factor (VIF) value. A VIF value below 10 indicates that the model is free from multicollinearity problems, allowing for a more accurate interpretation of the regression coefficients. Equation 1 to 4 are a regression model used to determine the effect of CEO demographics on cash holdings.

$$Cash\ Holdings_{i,d} = \beta_0 + \beta_1 CEOTEN_{i,d} + \sum_{i=2}^{n} \beta_i\, \varphi_{i,d} + \varepsilon_{i,d} \quad \text{.....1}$$

$$Cash\_Holdings_{i,d} = \beta_0 + \beta_1 CEOAGE_{i,d} + \sum_{i=2}^{n} \beta_i\, \varphi_{i,d} + \varepsilon_{i,d} \quad \text{.....2}$$

Table 2. Descriptive Statistics

Variable	n	Mean	S.D.	Min	0.25	Mdn	0.75	Max
CEOAGE	637	4.03	0.11	3.50	3.99	4.04	4.09	4.23
CEOGEN	637	0.15	0.35	0.00	0.00	0.00	0.00	1.00
CEOTEN	637	1.52	0.68	0.69	1.10	1.61	1.95	2.77
CEOEDU	637	0.96	0.21	0.69	0.69	1.10	1.10	1.39
CASHNA	637	1.33	0.81	-2.03	0.76	1.17	1.74	5.77
LNCASHNA	637	0.09	0.68	-3.17	-0.26	0.16	0.55	1.75
FAGE	637	3.74	0.53	1.95	3.30	3.81	4.08	4.84
FSIZE	637	30.99	1.83	25.22	29.70	30.84	32.42	35.23
ROE	637	9.99	24.62	-205.72	1.45	9.53	19.90	135.50
LEV	637	3.65	5.37	0.00	0.00	1.79	5.14	48.68
WC	637	0.18	0.11	0.05	0.13	0.16	0.21	1.20
INFL	637	6.27	4.68	-0.40	3.75	4.97	8.27	18.15
GDPGR	637	4.73	2.00	-2.07	4.88	5.07	5.56	6.35

Table 3. Variance Inflation Factor

Variable	VIF	1/VIF	Variable	VIF	1/VIF
CEOTEN	1.080	0.926	CEOAGE	1.060	0.946
FSIZE	1.670	0.600	FSIZE	1.640	0.610
INFL	1.390	0.718	INFL	1.390	0.719
GDPGR	1.380	0.724	GDPGR	1.380	0.724
FAGE	1.330	0.754	FAGE	1.330	0.754
LEV	1.230	0.815	LEV	1.210	0.827
ROE	1.190	0.840	ROE	1.190	0.839
WC	1.110	0.902	WC	1.110	0.901
Mean VIF	**1.3**		**Mean VIF**	**1.29**	
Variable	**VIF**	**1/VIF**	**Variable**	**VIF**	**1/VIF**
CEOEDU	1.030	0.970	CEOGEN	1.030	0.973
FSIZE	1.590	0.627	FSIZE	1.600	0.627
INFL	1.390	0.719	INFL	1.390	0.719
GDPGR	1.380	0.724	GDPGR	1.380	0.724
FAGE	1.330	0.754	FAGE	1.330	0.752
LEV	1.220	0.822	LEV	1.220	0.818
ROE	1.190	0.839	ROE	1.190	0.841
WC	1.120	0.897	WC	1.120	0.896
Mean VIF	**1.28**		**Mean VIF**	**1.28**	

$$Cash\_Holdings_{i,d} = \beta_0 + \beta_1 CEOEDU_{i,d} + \sum_{i=2}^{n} \beta_i \varphi_{i,d} + \varepsilon_{i,d} \quad \text{.....3}$$

$$Cash\_Holdings_{i,d} = \beta_0 + \beta_1 CEOGEN_{i,d} + \sum_{i=2}^{n} \beta_i \varphi_{i,d} + \varepsilon_{i,d} \quad \text{.....4}$$

RESULTS AND DISCUSSIONS

In this descriptive statistical analysis, we focus on the independent and dependent variables as well as firm and country-level control variables to describe the distribution of data in the study on the effect of CEO characteristics on cash holdings in banking companies listed on the Indonesia Stock Exchange (shown in Table 2). CEO age (CEOAGE) averages 4.03 for the independent variables, with a standard deviation of 0.11, a minimum value of 3.50, and a maximum of 4.23. CEO gender (CEOGEN), measured as a dummy variable, has a mean of 0.15, indicating a lower proportion of female CEOs in the sample. CEO tenure (CEOTEN) averages 1.52 with variations from 0.69 to 2.77. CEO educational background (CEOEDU) has an average of 0.96.

The proportion of cash and cash equivalents to total net assets (CASHNA) has a significant mean of 1.33, ranging from -2.03 to 5.77. The natural logarithm of the ratio (LNCASHNA) has an average of 0.09. Regarding firm-level control variables, firm size (FSIZE) has an average of 30.99, indicating the variation in asset size of firms in the sample. Firm age (FAGE) with an average of 3.74 indicates variation in firm age. Return on equity (ROE) averages 9.99%, indicating diverse financial performance. Leverage (LEV) averages 3.65, signaling different debt levels among firms. Net working capital (WC) has an average of 0.18. At the country level, the inflation rate (INF) has an average of 6.27%, while GDP growth (GDPGR) averages 4.73%, reflecting diverse macroeconomic conditions over the study period.

The multicollinearity test is an important step in regression analysis to ensure that independent variables are not highly correlated with each other, which can interfere with the estimation of model parameters. This study conducted the multicollinearity test by looking at the Variance Inflation Factor (VIF) value of each independent and control variable. The results of this test are shown in Table 3, which provides a detailed overview of the VIF values for each variable in the research model. In the model that examines the effect of CEO tenure (CEOTEN) on cash holdings, the highest VIF value is found in the firm size variable (FSIZE), with a value of 1,670. Nevertheless, this value still indicates that the variable does not cause multicollinearity. The other variables in this model, including inflation rate (INFL), GDP growth (GDPGR), firm age (FAGE), leverage (LEV), return on equity (ROE), and net working capital (WC), all show VIF values that indicate low correlation between variables. The average VIF for this

Table 4. Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) CEOAGE	1.000												
(2) CEOGEN	-0.093*	1.000											
	(0.019)												
(3) CEOTEN	0.391*	-0.219*	1.000										
	(0.000)	(0.000)											
(4) CEOEDU	-0.101*	-0.033	-0.199*	1.000									
	(0.011)	(0.409)	(0.000)										
(5) CASHNA	0.015	-0.072	-0.127*	0.079*	1.000								
	(0.703)	(0.069)	(0.001)	(0.046)									
(6) LNCASHNA	0.011	-0.042	-0.119*	0.081*	0.882*	1.000							
	(0.782)	(0.285)	(0.003)	(0.041)	(0.000)								
(7) FAGE	0.089*	0.054	0.095*	-0.051	-0.119*	-0.098*	1.000						
	(0.025)	(0.176)	(0.016)	(0.199)	(0.003)	(0.013)							
(8) FSIZE	0.202*	0.028	0.220*	-0.065	0.003	0.085*	0.472*	1.000					
	(0.000)	(0.487)	(0.000)	(0.103)	(0.946)	(0.032)	(0.000)						
(9) ROE	0.125*	0.002	0.120*	0.030	0.072	0.071	0.207*	0.345*	1.000				
	(0.002)	(0.952)	(0.002)	(0.457)	(0.071)	(0.073)	(0.000)	(0.000)					
(10) LEV	0.008	-0.099*	-0.044	-0.135*	-0.022	0.010	0.253*	0.377*	0.091*	1.000			
	(0.845)	(0.013)	(0.270)	(0.001)	(0.578)	(0.798)	(0.000)	(0.000)	(0.021)				
(11) WC	-0.084*	-0.096*	-0.076	0.102*	0.419*	0.401*	-0.216*	-0.224*	0.026	-0.100*	1.000		
	(0.035)	(0.016)	(0.056)	(0.010)	(0.000)	(0.000)	(0.000)	(0.000)	(0.518)	(0.011)			
(12) INFL	0.037	0.008	0.035	-0.042	0.254*	0.224*	-0.033	-0.039	0.103*	0.090*	0.143*	1.000	
	(0.355)	(0.832)	(0.373)	(0.288)	(0.000)	(0.000)	(0.404)	(0.325)	(0.009)	(0.023)	(0.000)		
(13) GDPGR	0.023	-0.001	0.020	-0.016	0.268*	0.294*	-0.050	-0.044	0.140*	-0.022	0.137*	0.509*	1.000
	(0.570)	(0.971)	(0.618)	(0.693)	(0.000)	(0.000)	(0.207)	(0.270)	(0.000)	(0.580)	(0.001)	(0.000)	

*** p<0.01, ** p<0.05, * p<0.1

model is 1.3, which reaffirms that the model is stable and free from multicollinearity.

Similar results were found in the second model, which examines the effect of CEO age (CEOAGE) on cash holdings. The VIF value for the CEOAGE variable is 1.060, indicating strong independence from the other variables in the model. The average VIF for this model is 1.29, reaffirming no concerning multicollinearity issues. The third

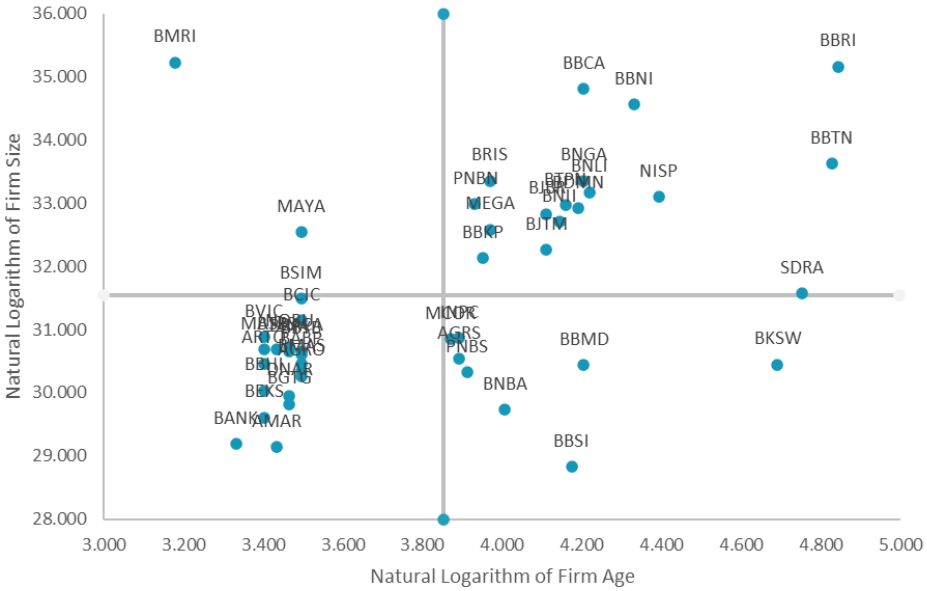

Figure 1. Classification Based on Firm Age and Size

model, which focuses on the effect of the CEO's educational background (CEOEDU) on cash holdings, also shows consistent results with the previous two models. The VIF value for CEOEDU is 1.030, which further confirms that this variable operates independently of the other variables in the model. Finally, in the model examining the effect of CEO gender (CEOGEN) on cash holdings, a VIF value of 1.030 was found for CEOGEN, indicating that this variable is free from multicollinearity with other variables in the model. The average VIF for this model is 1.28, which is similar to the previous model and indicates that this model does not have multicollinearity issues. In conclusion, the multicollinearity test results for all models tested in this study indicate that the models are stable and valid for further analysis. This provides a strong basis to proceed with regression analysis and interpretation of the results to test the research hypotheses regarding the effect of CEO characteristics on cash holdings.

The pairwise correlation analysis conducted in this study reveals the relationship between CEO characteristics and corporate cash holdings involving independent, dependent, and control variables. The results of this analysis are presented in Table 4, providing important insights into the relationship between the observed variables. For the independent variables, there is a significant positive correlation between CEO tenure (CEOTEN) and CEO age (CEOAGE) with a correlation value of 0.391, indicating that the longer the CEO tenure, the higher the CEO age usually is. In addition, there is a negative relationship between CEO gender (CEOGEN) and CEO tenure, with a correlation value of -0.219, indicating a difference in leadership duration between male and female CEOs. Furthermore, control variables such as firm size (FSIZE) and leverage (LEV) show significant relationships with several independent and dependent variables, confirming the importance of these factors in the analysis of cash holdings. Table 4 presents the Pairwise correlation coefficients between the variables used for hypothesis testing (p-values are in parentheses).

MULTIVARIATE STATISTICAL ANALYSIS

This study divides the sample into four quadrants based on firm age and size to better understand the impact of firm characteristics on cash-holding policies (shown in Figure 1). The first quadrant, which includes 17 firms with characteristics of old age and large size, offers a unique perspective on firms that have been operating for a long time and have a large scale. In contrast, only two companies fall into the second quadrant, which describes companies of a young age but large size, highlighting the unique dynamics of fast-growing companies. The third quadrant, with 19 companies whose characteristics include young age and small size, provides insights into the challenges and cash-holding strategies for companies still in the early growth phase. The fourth quadrant, which contains eight old-age companies but small in size, opens up opportunities for investigation into stable but non-expansionary companies. Further analysis of each quadrant through the developed regression model will enable this study to identify specific patterns and dissect the influence of firm characteristics on cash holdings policy with more detail and rich nuances.

Relationship Between CEO Tenure and Cash Holdings

This section presents the regression analysis results reviewed in this study, highlighting the relationship between CEO tenure (CEOTEN) and firm cash holdings using two different cash holdings proxies (results are presented in Table 5). The results for models (1) and (2), which use CASHNA as the dependent variable, show that CEO tenure significantly negatively affects the proportion of cash and cash equivalents to total assets. This effect remains consistent in models (3) and (4), which use LNCASHNA as a proxy for cash holdings. The regression ana-

Table 5. Regression Results

	(1)	(2)	(3)	(4)
	CASHNA	**CASHNA**	**LNCASHNA**	**LNCASHNA**
CEOTEN	-0.151***	-0.169***	-0.120***	-0.150***
	(-3.26)	(-4.14)	(-3.01)	(-4.24)
FAGE		-0.136**		-0.140***
		(-2.10)		(-2.69)
FSIZE		0.0849***		0.110***
		(4.40)		(4.94)
ROE		0.00000145		-0.000972
		(0.00)		(-0.92)
LEV		-0.00729		-0.00518
		(-1.45)		(-1.36)
WC		2.862***		2.420***
		(5.10)		(5.06)
INFL		0.0235***		0.0117**
		(3.16)		(2.03)
GDPGR		0.0612***		0.0733***
		(4.52)		(5.20)
_cons	1.555***	-1.481**	0.273***	-3.411***
	(18.74)	(-2.48)	(4.12)	(-5.03)
N	637	637	637	637
R^2-Adj	0.0145	0.258	0.0126	0.279
F_Stat	10.63	20.10	9.078	17.03
Prob > F	0.0000	0.0000	0.0000	0.0000

The table 5 presents the regression results examining the effect of CEO Tenure on corporate cash holdings. Models (1) and (3) investigate CEO Tenure's effect on corporate cash holdings without control variables. At the same time, Models (2) and (4) are models with control variables. The regression model used is as follows: Cash Holdings$_{i,d}$ = f(CEOTEN$_{i,d}$ +$\varphi_{i,d}$). The variable $\varphi_{i,d}$ is a control variable that comprises factors such as Firm Size (FSIZE), Firm Age (FAGE), Return On Equity (ROE), Leverage (LEV), Net working capital (WC), inflation rate (INF), and GDP growth (GDPGR). The table includes regression coefficients and t-statistics (b/t_{stat}). Robust regressions have been presented to account for heteroscedasticity and autocorrelation. The significance levels are denoted by ***, **, and *, corresponding to 1%, 5%, and 10% respectively.

lysis shows that CEO tenure significantly negatively affects corporate cash holdings. In the model without control variables, CEO tenure is negatively related to cash holdings ($p < 0.01$, $\beta = -0.151$, $t = -3.26$) for CASHNA and ($p < 0.01$, $\beta = -0.120$, $t = -3.01$) for LNCASHNA. When control variables are included, this relationship remains significant with ($p < 0.01$, $\beta = -0.169$, $t = -4.14$) for CASHNA and ($p < 0.01$, $\beta = -0.150$, $t = -4.24$) for LNCASHNA, indicating consistency in the effect of CEO tenure on cash holding strategy.

Factors such as Firm Size (FSIZE) and GDP Growth (GDPGR) positively and significantly affect cash holdings ($p < 0.01$, $\beta = 0.0849$, $t = 4.40$ for FSIZE on CASHNA and $p < 0.01$, $\beta = 0.0612$, $t = 4.52$ for GDPGR), signaling that larger firms with a growing economic environment are more likely to hold more cash. On the other hand, Firm Age (FAGE) and Inflation Rate (INFL) have a negative impact on cash holdings, with FAGE showing ($p < 0.05$, $\beta = -0.136$, $t = -2.10$) for CASHNA, indicating older firms tend to have lower cash holdings. Working Capital (WC) has a positive and significant effect on cash holdings ($p < 0.01$, $\beta = 2.862$, $t = 5.10$ for CASHNA), confirming the importance of operational liquidity in cash holding decisions. The R^2-Adjusted for the model indicates that the model adequately explains the variability in cash holdings, with high F-Stat values and low Prob > F ($p < 0.0000$, R^2-Adj = 0.258, F-Stat = 20.10 for CASHNA model with controls) indicating the statistical reliability of the model.

Table 6. Regression Results

	Quad. 1	Quad. 1	Quad. 2	Quad. 2	Quad. 3	Quad. 3	Quad. 4	Quad. 4
	CASHNA	**LNCASHNA**	**CASHNA**	**LNCASHNA**	**CASHNA**	**LNCASHNA**	**CASHNA**	**LNCASHNA**
CEOTEN	-0.285***	-0.248***	1.144***	1.065***	-0.121	-0.156**	-0.0698	-0.0707
	(-5.26)	(-7.23)	(3.55)	(3.60)	(-1.41)	(-2.07)	(-0.57)	(-0.59)
FAGE	-0.235	-0.148	-1.162***	-1.179***	-2.170***	-2.267***	-0.327	-0.423*
	(-1.51)	(-1.47)	(-3.62)	(-3.44)	(-4.30)	(-7.19)	(-1.26)	(-1.90)
FSIZE	-0.0681**	-0.0557**	0.221**	0.201**	0.409***	0.446***	0.265**	0.371***
	(-1.99)	(-2.09)	(2.60)	(2.50)	(9.14)	(8.65)	(2.28)	(3.57)
ROE	0.00537**	0.00399**	0.00353	-0.00192	-0.00165	-0.00327***	-0.0122	-0.00817**
	(2.59)	(2.41)	(0.73)	(-0.37)	(-1.18)	(-2.67)	(-1.48)	(-2.52)
LEV	-0.0163***	-0.0153***	0.00619	-0.00209	-0.0213	-0.0236*	-0.0236**	-0.0182**
	(-2.62)	(-2.84)	(1.09)	(-0.38)	(-0.85)	(-1.84)	(-2.55)	(-2.17)
WC	3.328***	2.208***	9.084***	8.461***	2.216***	2.024***	6.534***	8.173***
	(2.90)	(2.71)	(5.65)	(6.48)	(3.78)	(3.89)	(4.62)	(5.93)
INFL	0.0253***	0.0148**	-0.0160	-0.0308	-0.0278*	-0.0369***	0.0621**	0.0389**
	(2.78)	(2.50)	(-0.94)	(-1.46)	(-1.80)	(-2.82)	(2.53)	(2.06)
GDPGR	0.0349	0.0498**	0.0181	0.0336**	0.0638***	0.0635***	0.00436	0.0317
	(1.53)	(2.51)	(1.09)	(2.07)	(2.72)	(2.97)	(0.17)	(1.36)
_cons	4.074***	2.259**	-6.320**	-6.328**	-4.090**	-6.002***	-6.779**	-11.09***
	(3.44)	(2.45)	(-2.29)	(-2.28)	(-2.56)	(-4.11)	(-2.16)	(-4.07)
N	291	291	33	33	220	220	93	93
R^2-Adj	0.424	0.440	0.851	0.822	0.330	0.454	0.422	0.558
F_Stat	19.96	25.39	59.11	41.20	16.93	15.80	9.407	17.23
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

The Table 6 presents the regression results that examine the effect of CEO tenure on corporate cash holdings across four different quadrants. The regression model used is as follows: $Cash\_Holdings_{i,d} = f(CEOTEN_{i,d} + \varphi_{i,d})$. The variable $\varphi_{i,d}$ is a control variable that comprises factors such as Firm Size (FSIZE), Firm Age (FAGE), Return On Equity (ROE), Leverage (LEV), Net working capital (WC), inflation rate (INF), and GDP growth (GDPGR). The table includes regression coefficients and t-statistics (b/t_{stat}). Robust regressions have been presented to account for heteroscedasticity and autocorrelation. The significance levels are denoted by ***, **, and *, corresponding to 1%, 5%, and 10% respectively.

The effect of CEO tenure on firms' cash holdings provides essential insights into how experience and knowledge gained over time can influence managers' decisions on liquidity strategies (regression results are shown in Table 6). This analysis, divided into four quadrants based on firm age and size, reveals the complex dynamics between CEO tenure and cash holdings. In quadrant 1, older and larger companies show a significant negative relationship between CEO tenure and cash holdings. CEOs with longer tenures in large firms tend to optimize the capital structure and reduce excessive cash holdings, perhaps because they have more experience and confidence to manage risks effectively. Meanwhile, quadrant 2 represents young, large companies where CEO tenure positively affects cash holdings. CEOs may prioritize financial flexibility to support expansion and innovation, reflecting the growth orientation of young firms. Quadrant 3, which includes young companies of small size, also shows a significant negative relationship

Table 7. Regression Results

	(1)	(2)	(3)	(4)
	CASHNA	**CASHNA**	**LNCASHNA**	**LNCASHNA**
CEOAGE	0.113	0.136	0.0692	0.00345
	(0.42)	(0.51)	(0.23)	(0.01)
FAGE		-0.135**		-0.140***
		(-2.10)		(-2.70)
FSIZE		0.0672***		0.0960***
		(3.48)		(4.32)
ROE		-0.000225		-0.00114
		(-0.12)		(-1.11)
LEV		-0.00378		-0.00227
		(-0.76)		(-0.60)
WC		2.915***		2.460***
		(5.18)		(5.13)
INFL		0.0218***		0.0103*
		(2.89)		(1.74)
GDPGR		0.0614***		0.0736***
		(4.52)		(5.19)
_cons	0.870	-1.751	-0.188	-3.194***
	(0.81)	(-1.50)	(-0.16)	(-2.64)
N	637	637	637	637
R^2-Adj	-0.00135	0.240	-0.00145	0.258
F_Stat	0.180	18.69	0.0537	14.93
Prob > F	0.672	0.0000	0.817	0.0000

The table 7 presents the regression results examining the effect of CEO Age on corporate cash holdings. Models (1) and (3) investigate the effect of CEO age on corporate cash holdings without control variables. While Models (2) and (4) are models with control variables. The regression model used is as follows: $Cash\_Holdings_{i,d} = f(CEOAGE_{i,d} + \varphi_{i,d})$. The variable $\varphi_{i,d}$ is a control variable that comprises factors such as Firm Size (FSIZE), Firm Age (FAGE), Return On Equity (ROE), Leverage (LEV), Net working capital (WC), inflation rate (INF), and GDP growth (GDPGR). The table includes regression coefficients and t-statistics (b/t_{stat}). Robust regressions have been presented to account for heteroscedasticity and autocorrelation. The significance levels are denoted by ***, **, and *, corresponding to 1%, 5%, and 10% respectively.

between CEO tenure and cash holdings. In this case, the CEO may seek to reduce cash holdings as a strategy to improve operational efficiency and more aggressively allocate capital to pursue growth. Finally, quadrant 4, which represents old, small firms, shows that CEO tenure has no significant effect on cash holdings. This suggests that for firms with these characteristics, factors other than CEO tenure, such as dividend payout policy or investment needs, may be more dominant in determining the level of cash holdings.

Relationship Between CEO Age and Cash Holdings

This section presents the regression analysis results reviewed in this study, highlighting the relationship between CEO Age (CEOAGE) and firm cash holdings using two different cash holdings proxies (results are presented in Table 7). The results for models (1) and (2), which use CASHNA as the dependent variable, show that CEO Age has no significant effect on the proportion of cash and cash equivalents to total assets. This effect remains consistent in models (3) and (4), which use LNCASHNA as a proxy for cash holdings. In the CASHNA model without control variables, CEO age shows no significant effect on cash holdings $p > 0.1$ ($\beta = 0.113$, $t = 0.42$), indicating that CEO age in isolation is insufficient to influence a firm's cash holding strategy. When control variables are included,

Table 8. Regression Results

	Quad. 1	Quad. 1	Quad. 2	Quad. 2	Quad. 3	Quad. 3	Quad. 4	Quad. 4
	CASHNA	**LNCASHNA**	**CASHNA**	**LNCASHNA**	**CASHNA**	**LNCASHNA**	**CASHNA**	**LNCASHNA**
CEOAGE	-0.763*	-1.354***	9.620***	8.949***	0.503*	0.539**	0.205	-0.649
	(-1.94)	(-3.70)	(3.55)	(3.60)	(1.88)	(2.19)	(0.39)	(-1.44)
FAGE	-0.123	-0.0842	-1.162***	-1.179***	-2.090***	-2.175***	-0.238	-0.431**
	(-0.80)	(-0.81)	(-3.62)	(-3.44)	(-4.20)	(-6.89)	(-0.95)	(-2.10)
FSIZE	-0.0966***	-0.0718***	0.221**	0.201**	0.395***	0.429***	0.233**	0.361***
	(-2.69)	(-2.62)	(2.60)	(2.50)	(8.91)	(8.24)	(2.55)	(4.05)
ROE	0.00531**	0.00407**	0.00353	-0.00192	-0.00163	-0.00327**	-0.0129	-0.00763**
	(2.33)	(2.31)	(0.73)	(-0.37)	(-1.11)	(-2.39)	(-1.61)	(-2.43)
LEV	-0.0138**	-0.0154***	0.00619	-0.00209	-0.0243	-0.0271**	-0.0204**	-0.0154*
	(-2.07)	(-2.77)	(1.09)	(-0.38)	(-0.97)	(-2.09)	(-2.43)	(-1.88)
WC	3.474***	2.335***	9.084***	8.461***	2.188***	1.983***	6.655***	8.026***
	(3.02)	(2.82)	(5.65)	(6.48)	(3.75)	(3.89)	(4.57)	(6.12)
INFL	0.0231**	0.0127**	-0.0160	-0.0308	-0.0280*	-0.0370***	0.0601**	0.0366*
	(2.51)	(2.09)	(-0.94)	(-1.46)	(-1.82)	(-2.74)	(2.43)	(1.97)
GDPGR	0.0354	0.0497**	0.0181	0.0336**	0.0651***	0.0651***	0.00664	0.0320
	(1.54)	(2.45)	(1.09)	(2.07)	(2.78)	(3.17)	(0.26)	(1.28)
_cons	7.139***	7.596***	-43.46***	-40.87***	-6.090***	-8.143***	-7.165*	-8.220***
	(4.16)	(4.53)	(-3.38)	(-3.47)	(-3.21)	(-4.63)	(-1.97)	(-2.84)
N	291	291	33	33	220	220	93	93
R^2-Adj	0.374	0.391	0.851	0.822	0.331	0.451	0.420	0.563
F_Stat	18.53	18.68	59.11	41.20	16.44	16.03	8.386	13.35
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

The Table 8 presents the regression results that examine the effect of CEO Age on corporate cash holdings across four different quadrants. The regression model used is as follows: Cash Holdings$_{i,d}$ = f(CEOAGE$_{i,d}$ + $\varphi_{i,d}$). The variable $\varphi_{i,d}$ is a control variable that comprises factors such as Firm Size (FSIZE), Firm Age (FAGE), Return on Equity (ROE), Leverage (LEV), Net working capital (WC), inflation rate (INF), and GDP growth (GDPGR). The table includes regression coefficients and t-statistics (b/t_{stat}). Robust regressions have been presented to account for heteroscedasticity and autocorrelation. The significance levels are denoted by ***, **, and *, corresponding to 1%, 5%, and 10% respectively.

CEO age still does not have a significant effect on cash holdings on the LNCASHNA proxy at $p > 0.1$ ($\beta = -0.00345$, $t = 0.01$), confirming that other factors, not CEO age, are more dominant in determining cash holdings strategy. However, Firm Size (FSIZE) and GDP Growth (GDPGR) consistently have a positive and significant impact on cash holdings across all models ($p < 0.01$, $\beta = 0.0672$ for FSIZE on CASHNA, $t = 3.48$; $p < 0.01$, $\beta = 0.0736$ for GDPGR on LNCASHNA, $t = 5.19$), highlighting the importance of operational scale and macroeconomic conditions in cash-related decision making. In contrast, Firm Age (FAGE) significantly negatively impacts cash holdings ($p < 0.05$, $\beta = -0.135$ on CASHNA, $t = -2.10$), indicating older firms may be more efficient in their cash management or have better access to capital markets. Working Capital (WC) has a strong positive effect on cash holdings ($p < 0.01$, $\beta = 2.915$ on CASHNA, $t = 5.18$), confirming that operational liquidity is a key factor in holding cash.R2-Adjusted shows the

Table 9. Regression Results

	(1)	(2)	(3)	(4)
	CASHNA	**CASHNA**	**LNCASHNA**	**LNCASHNA**
CEOEDU	0.306**	0.195	0.265*	0.192
	(2.11)	(1.49)	(1.96)	(1.59)
FAGE		-0.134**		-0.139***
		(-2.11)		(-2.72)
FSIZE		0.0692***		0.0963***
		(3.66)		(4.42)
ROE		-0.000275		-0.00123
		(-0.15)		(-1.16)
LEV		-0.00311		-0.00137
		(-0.62)		(-0.35)
WC		2.873***		2.427***
		(5.13)		(5.08)
INFL		0.0224***		0.0107*
		(2.95)		(1.80)
GDPGR		0.0618***		0.0739***
		(4.55)		(5.20)
_cons	1.033***	-1.451**	-0.162	-3.403***
	(7.45)	(-2.40)	(-1.21)	(-4.82)
N	637	637	637	637
R^2-Adj	0.00469	0.242	0.00503	0.261
F_Stat	4.455	18.63	3.856	14.88
Prob > F	0.0352	0.0000	0.0500	0.0000

The Table 9 presents the regression results examining the effect of CEO Education on corporate cash holdings. Models (1) and (3) are models that investigate the effect of CEO Education on corporate cash holdings without control variables. While Models (2) and (4) are models with control variables. The regression model used is as follows: Cash $Holdings_{i,d} = f(CEOEDU_{i,d} + \varphi_{i,d})$. The variable $\varphi_{i,d}$ is a control variable that comprises factors such as Firm Size (FSIZE), Firm Age (FAGE), Return On Equity (ROE), Leverage (LEV), Net working capital (WC), inflation rate (INF), and GDP growth (GDPGR). The table includes regression coefficients and t-statistics (b/t_{stat}). Robust regressions have been presented to account for heteroscedasticity and autocorrelation. The significance levels are denoted by ***, **, and *, corresponding to 1%, 5%, and 10% respectively.

variation in cash holdings explained by the model, with a significant F-Stat value in the model with control variables ($p < 0.0000$, F-Stat = 18.69 for CASHNA), indicating that the model is statistically significant in explaining firms' cash holding behavior.

The analysis of the effect of CEO age on cash holdings provides an in-depth understanding of how leadership experience and vision can affect a company's financial policy. By creating four quadrants based on the combination of age and company size, we can observe significant variations in the effect (see Table 8). In quadrant 1, which includes older, large firms, the age of the CEO has a negative effect on cash holdings. This may be due to the experience and confidence of older CEOs in managing the operations of large and stable firms, encouraging them to minimize unproductive cash to improve the efficiency of resource use. Quadrant 2, representing young, large companies, shows a positive relationship between CEO age and cash holdings. Young CEOs in these large firms may recognize the importance of having a larger cash buffer to support innovation and expansion in a competitive business environment and capitalize on rapid growth opportunities. Meanwhile, Quadrant 3, which focuses on young and small companies, also finds that CEO age positively affects cash holdings. In this scenario, young CEOs may be more conservative in their cash management as the company is still in its growth phase and faces greater uncertainties,

Table 10. Regression Results

	Quad. 1	Quad. 1	Quad. 2	Quad. 2	Quad. 3	Quad. 3	Quad. 4	Quad. 4
	CASHNA	**LNCASHNA**	**CASHNA**	**LNCASHNA**	**CASHNA**	**LNCASHNA**	**CASHNA**	**LNCASHNA**
CEOEDU	0.289*	0.188	3.536***	3.289***	-0.0988	0.150	0.467*	0.560*
	(1.79)	(1.34)	(3.55)	(3.60)	(-0.43)	(0.66)	(1.68)	(1.67)
FAGE	-0.0383	0.0120	-1.162***	-1.179***	-2.136***	-2.243***	-0.453*	-0.585**
	(-0.27)	(0.12)	(-3.62)	(-3.44)	(-4.27)	(-7.05)	(-1.71)	(-2.38)
FSIZE	-0.108***	-0.0898***	0.221**	0.201**	0.399***	0.440***	0.253***	0.362***
	(-3.16)	(-3.21)	(2.60)	(2.50)	(8.76)	(8.11)	(2.71)	(4.09)
ROE	0.00517**	0.00382*	0.00353	-0.00192	-0.00159	-0.00352***	-0.0127	-0.00866***
	(2.17)	(1.93)	(0.73)	(-0.37)	(-1.03)	(-2.61)	(-1.59)	(-2.86)
LEV	-0.00844	-0.00912	0.00619	-0.00209	-0.0217	-0.0266**	-0.0261***	-0.0217**
	(-1.28)	(-1.54)	(1.09)	(-0.38)	(-0.85)	(-2.04)	(-2.91)	(-2.33)
WC	3.387***	2.278***	9.084***	8.461***	2.169***	1.960***	6.673***	8.329***
	(2.96)	(2.74)	(5.65)	(6.48)	(3.82)	(3.91)	(4.79)	(6.42)
INFL	0.0244***	0.0138**	-0.0160	-0.0308	-0.0279*	-0.0358***	0.0636**	0.0411**
	(2.64)	(2.27)	(-0.94)	(-1.46)	(-1.83)	(-2.68)	(2.57)	(2.23)
GDPGR	0.0373	0.0516**	0.0181	0.0336**	0.0649***	0.0648***	-0.00310	0.0224
	(1.57)	(2.39)	(1.09)	(2.07)	(2.78)	(3.04)	(-0.11)	(0.85)
_cons	3.747***	2.072**	-7.185**	-7.132**	-3.952**	-6.218***	-6.447**	-10.77***
	(3.09)	(2.21)	(-2.42)	(-2.42)	(-2.57)	(-3.82)	(-2.27)	(-4.33)
N	291	291	33	33	220	220	93	93
R^2-Adj	0.374	0.369	0.851	0.822	0.325	0.443	0.427	0.567
F_Stat	16.95	15.83	59.11	41.20	16.65	15.10	7.648	13.57
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

The Table 10 presents the regression results that examine the effect of CEO Education on corporate cash holdings across four different quadrants. The regression model used is as follows: Cash Holdings$_{i,d}$ = f(CEOEDU$_{i,d}$ + $\varphi_{i,d}$). The variable $\varphi_{i,d}$ is a control variable that comprises factors such as Firm Size (FSIZE), Firm Age (FAGE), Return on Equity (ROE), Leverage (LEV), Net working capital (WC), inflation rate (INF), and GDP growth (GDPGR). The table includes regression coefficients and t-statistics (b/t_{stat}). Robust regressions have been presented to account for heteroscedasticity and autocorrelation. The significance levels are denoted by ***, **, and *, corresponding to 1%, 5%, and 10% respectively.

suggesting additional liquidity is needed to meet such challenges. On the other hand, quadrant 4, which includes older and smaller companies, finds no significant relationship between CEO age and cash holdings. This suggests that factors other than CEO age, such as market conditions and operational strategies, influence cash-holding decisions more in the context of older, smaller companies.

Relationship Between CEO Education and Cash Holdings

This section presents the regression analysis results reviewed in this study, highlighting the relationship between CEO Education (CEOEDU) and firm cash holdings

Table 11. Regression Results

	(1)	(2)	(3)	(4)
	CASHNA	**CASHNA**	**LNCASHNA**	**LNCASHNA**
CEOGEN	-0.165**	-0.0883	-0.0816	-0.0156
	(-2.40)	(-1.63)	(-1.14)	(-0.28)
FAGE		-0.132**		-0.139***
		(-2.05)		(-2.70)
FSIZE		0.0695***		0.0961***
		(3.61)		(4.33)
ROE		-0.000203		-0.00114
		(-0.11)		(-1.11)
LEV		-0.00483		-0.00240
		(-0.95)		(-0.62)
WC		2.881***		2.456***
		(5.15)		(5.11)
INFL		0.0223***		0.0103*
		(2.93)		(1.74)
GDPGR		0.0613***		0.0735***
		(4.52)		(5.19)
_cons	1.350***	-1.264**	0.103***	-3.209***
	(37.28)	(-2.10)	(3.47)	(-4.67)
N	637	637	637	637
R^2-Adj	0.00365	0.241	0.000227	0.258
F_Stat	5.778	18.63	1.311	14.69
Prob > F	0.0165	0.0000	0.253	0.0000

The Table 11 presents the regression results examining the effect of CEO Gender on corporate cash holdings. Models (1) and (3) are models that investigate the effect of CEO Gender on corporate cash holdings without control variables. At the same time, Models (2) and (4) are models with control variables. The regression model used is as follows: Cash Holdings$_{i,d}$ = f(CEOGEN$_{i,d}$ + $\varphi_{i,d}$). The variable $\varphi_{i,d}$ is a control variable that comprises factors such as Firm Size (FSIZE), Firm Age (FAGE), Return On Equity (ROE), Leverage (LEV), Net working capital (WC), inflation rate (INF), and GDP growth (GDPGR). The table includes regression coefficients and t-statistics (b/t_{stat}). Robust regressions have been presented to account for heteroscedasticity and autocorrelation. The significance levels are denoted by ***, **, and *, corresponding to 1%, 5%, and 10% respectively.

using two different cash holdings proxies (results are presented in Table 9). The results for models (1) and (3), namely for models without control variables, show that CEO education has a significant positive effect on the proportion of cash and cash equivalents to total assets. However, in models (2) and (4) it is not significant. In the CASHNA model without control variables, CEO education significantly positively impacts cash holdings ($p < 0.05$, $\beta = 0.306$, $t = 2.11$), and this persists with the addition of control variables ($p > 0.05$, $\beta = 0.195$, $t = 1.49$), albeit with a lower level of significance. In the LNCASHNA proxy, a positive effect of CEO education on cash holdings is also observed ($p < 0.05$, $\beta = 0.265$, $t = 1.96$ without controls; $p > 0.05$, $\beta = 0.192$, $t = 1.59$ with controls), indicating that more educated CEOs tend to favor a larger cash holding strategy, possibly due to a tendency to manage corporate risks and investments more prudently. Firm age (FAGE) shows a significant negative relationship with cash holdings in all models ($p < 0.05$, $\beta = -0.134$, $t = -2.11$ for CASHNA proxy; $p < 0.01$, $\beta = -0.139$, $t = -2.72$ for LNCASHNA proxy), suggesting that older firms may have better access to external funding sources or more efficient cash management policies. Firm size (FSIZE) and GDP growth (GDPGR) consistently have a positive and significant impact on cash holdings ($p < 0.01$ for both), suggesting that larger firms operating in a growing economy tend to hold more cash to deal with uncertainty and capitalize on investment opportunities. Working capital (WC) and inflation (INFL) also

Table 12. Regression Results

	Quad. 1	Quad. 1	Quad. 2	Quad. 2	Quad. 3	Quad. 3	Quad. 4	Quad. 4
	CASHNA	**LNCASHNA**	**CASHNA**	**LNCASHNA**	**CASHNA**	**LNCASHNA**	**CASHNA**	**LNCASHNA**
CEOGEN	-0.190***	-0.0634	.	.	0.0919	0.196**	0.0720	-0.933**
	(-3.24)	(-1.19)	.	.	(0.96)	(2.46)	(0.25)	(-2.62)
FAGE	-0.0665	-0.0125	-0.375	-0.447*	-2.155***	-2.258***	-0.268	-0.277
	(-0.43)	(-0.11)	(-1.56)	(-1.72)	(-4.34)	(-7.20)	(-0.97)	(-1.38)
FSIZE	-0.105***	-0.0882***	-0.0798*	-0.0788*	0.400***	0.433***	0.247**	0.237**
	(-2.95)	(-3.05)	(-2.06)	(-1.75)	(8.76)	(8.29)	(2.09)	(2.27)
ROE	0.00488*	0.00372*	-0.000903	-0.00605	-0.00171	-0.00336***	-0.0127	-0.00765**
	(1.95)	(1.84)	(-0.18)	(-1.16)	(-1.20)	(-2.67)	(-1.61)	(-2.40)
LEV	-0.0145**	-0.0121**	0.00619	-0.00209	-0.0198	-0.0193	-0.0208**	-0.0110
	(-2.06)	(-2.00)	(1.12)	(-0.40)	(-0.76)	(-1.44)	(-2.42)	(-1.55)
WC	3.320***	2.284***	10.55***	9.821***	2.181***	1.989***	6.674***	7.144***
	(2.90)	(2.72)	(5.07)	(5.52)	(3.81)	(3.98)	(4.68)	(5.96)
INFL	0.0238***	0.0132**	-0.0263	-0.0403	-0.0279*	-0.0373***	0.0604**	0.0313*
	(2.60)	(2.16)	(-1.17)	(-1.59)	(-1.81)	(-2.78)	(2.45)	(1.81)
GDPGR	0.0369	0.0511**	0.0220	0.0372	0.0642***	0.0635***	0.00655	0.0286
	(1.58)	(2.38)	(0.90)	(1.65)	(2.75)	(3.03)	(0.25)	(1.09)
_cons	4.134***	2.339**	3.402*	2.716	-4.019**	-5.848***	-6.627*	-7.542**
	(3.30)	(2.34)	(1.71)	(1.18)	(-2.54)	(-3.82)	(-1.94)	(-2.51)
N	291	291	33	33	220	220	93	93
R^2-Adj	0.378	0.367	0.787	0.745	0.326	0.450	0.420	0.605
F_Stat	16.20	15.61	28.80	21.73	17.16	15.39	8.624	15.84
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

The Table 12 presents the regression results that examine the effect of CEO Gender on corporate cash holdings across four different quadrants. The regression model used is as follows: Cash Holdings$_{i,d}$ = f(CEOGEN$_{i,d}$ + $\varphi_{i,d}$). The variable $\varphi_{i,d}$ is a control variable that comprises factors such as Firm Size (FSIZE), Firm Age (FAGE), Return On Equity (ROE), Leverage (LEV), Net working capital (WC), inflation rate (INF), and GDP growth (GDPGR). The table includes regression coefficients and t-statistics (b/t_{stat}). Robust regressions have been presented to account for heteroscedasticity and autocorrelation. The significance levels are denoted by ***, **, and *, corresponding to 1%, 5%, and 10% respectively.

play a significant role in determining cash holdings, with WC showing a strong positive relationship ($p < 0.01$, $\beta = 2.873$, $t = 5.13$ for LNCASHNA proxy) and INFL showing a positive effect at higher levels of inflation ($p < 0.05$, $\beta = 0.0224$, $t = 2.95$ without controls), confirming the importance of operational liquidity and protection against inflation in cash holding strategies.

Analyzing the effect of CEO education on cash holdings provides an interesting perspective on how executives' educational backgrounds can influence firms' financial strategies. By dividing the sample into four quadrants based on firm age and size, we can analyze the unique dynamics that emerge from the interaction between CEO education and cash holdings policy (see Table 10). In quadrant 1, which includes older, larger firms, the finding that CEO education has a positive but insignificant effect on

LNCASHNA and is significant at the 10% level for CASHNA can be interpreted as an indication that in established firms, strategic financial decisions may be based more on long-standing company policies than on innovation or strategic change initiated by the CEO's educational background. Meanwhile, Quadrant 2 highlights young, large firms where CEO education positively impacts cash holdings. This suggests that CEOs with a solid educational background are more likely to take a proactive approach to managing liquidity in companies still in the expansion phase to support future growth and investment. In Quadrant 3, young companies with small size, the absence of a significant effect of CEO education on cash holdings illustrates that other factors such as resource constraints may be more dominant in determining liquidity strategies than CEO education. Here, operational challenges and immediate funding needs may take priority. In the context of Quadrant 4, which includes older firms of small size, the finding that CEO education has a significant positive effect on cash holdings suggests that in more stable but resource-constrained business environments, CEO education may be a key factor in optimising financial strategies, including cash management.

Relationship Between CEO Gender and Cash Holdings

This section presents the results of the regression analysis examined in this study, which highlights the relationship between CEO gender (CEOGEN) and company cash holdings using two different proxies for cash holdings (the results are presented in Table 11). All the results obtained show that CEO gender does not affect cash holdings, although in model (1) it has a significant relationship. However, it is seen that the R2 adjusted value is very small. Models (1) and (3), which do not include control variables, show that CEO gender negatively affects cash holdings with different levels of significance; model (1) reveals a significant relationship ($p < 0.05$, $\beta = -0.165$, $t = -2.40$) for CASHNA, while model (3) does not show strong significance for LNCASHNA ($p > 0.05$, $\beta = -0.0816$, $t = -1.14$). The introduction of control variables in models (2) and (4) slightly reduces the magnitude and significance of the impact of CEO gender on cash holdings; model (2) shows a lower effect ($p > 0.05$, $\beta = -0.0883$, $t = -1.63$) for CASHNA and model (4) shows a minimal effect ($p > 0.05$, $\beta = -0.0156$, $t = -0.28$) for LNCASHNA. Factors such as Firm Age (FAGE), Firm Size (FSIZE), and GDP Growth (GDPGR) show consistent and significant relationships with cash holdings in all models, suggesting that independent of CEO gender, firm characteristics, and economic conditions have a significant impact on cash holding strategies. In particular, Firm Size (FSIZE) and GDP Growth (GDPGR) positively and significantly affect cash holdings ($p < 0.01$), confirming that larger firms and a growing economic environment favor higher levels of cash holdings. Working capital (WC) and inflation rate (INFL) also positively affect cash holdings, with working capital showing a strong positive effect ($p < 0.01$) across all models, emphasizing the importance of operational liquidity in cash holdings decisions.

The analysis results show different dynamics depending on the firm's specific context based on its age and size when discussing the effect of CEO gender on firms' cash holdings. These results provide insights into how gender differences in leadership may influence strategic decisions related to liquidity management and financial reserves (see Table 12). In quadrant 1, where firms are old and large, a female CEO has a negative effect on cash holdings. This may reflect a conservative or risk-averse approach to cash management, with female CEOs in large, established firms more likely to prioritize stability and reduce liquidity risk over accumulating excess cash. Quadrant 2 needs to provide specific data on the influence of female CEOs, as there are no female CEOs in the sample of young and large companies. This suggests there may still be a lack of gender representation in leadership positions in specific sectors or large companies. This could be an area for further research on board-level diversity and inclusion. In quadrant 3, which includes young and small companies, female CEOs significantly impact cash holdings. This may indicate that female CEOs may aggressively pursue opportunities by holding higher cash levels to support growth and innovation initiatives in a more dynamic and competitive business environment. Meanwhile, Quadrant 4 shows that in small old firms, female CEO gender has a significant negative effect on cash holdings for the LNCASHNA proxy but is not significant for the CASHNA proxy.

Discussion

The findings of this study reveal that CEO tenure has a significant negative effect on corporate cash holdings, contradicting the initial hypothesis (H1) that predicted a positive association. This suggests that long-tenured CEOs tend to hold lower levels of cash reserves, which warrants further discussion in the context of executive decision-making, risk preferences, and corporate financial policies. From the perspective of upper echelons theory (Hambrick & Mason, 1984), CEOs' decision-making is shaped by their characteristics, including experience and tenure. It was initially hypothesized that CEOs with longer tenures would accumulate higher cash reserves as a precaution against financial instability. However, the empirical results suggest the opposite trend, aligning with alternative explanations from agency theory and corporate governance perspectives.

One possible explanation is that long-tenured CEOs develop greater confidence in their strategic decision-making, reducing their reliance on excessive cash holdings. This is consistent with the findings of Liu & Jiang (2020), who noted that experienced CEOs tend to optimize liquidity management, particularly in firms with strong financial health. Over time, CEOs may develop better access to external financing, stronger investor relations, and more efficient working capital strategies, reducing the necessity for large cash reserves. Additionally, entrenchment theory suggests that long-serving CEOs exert greater control over corporate resources, leading them to prioritize

investments and financial strategies that align with their risk tolerance (Colak & Liljeblom, 2022). This supports the argument that strategic conservatism develops over time, where long-tenured CEOs may become less inclined to hold excess cash due to their familiarity with internal firm dynamics and external market conditions. Instead, they may redirect cash toward investments or debt repayments, viewing excess cash as an inefficient capital allocation.

Regulatory requirements, access to liquidity, and firm size all play crucial roles in determining cash-holding policies. The descriptive statistics indicate that many CEOs in the sample have long tenures, with an average tenure exceeding eight years. This may suggest that the CEOs in this dataset have already established strong internal governance mechanisms, reducing the need for precautionary cash reserves. Moreover, banking firms in Indonesia operate under strict regulatory oversight, which influences their liquidity management decisions. The Financial Services Authority (OJK) enforces capital adequacy and risk management requirements, reducing firms' dependency on CEO-driven cash-holding decisions. Thus, long-tenured CEOs in this industry may focus more on optimizing capital structure rather than accumulating excess liquidity.

The regression result also indicates that the magnitude of the negative effect of CEO tenure on cash holdings is stronger in larger firms. This is consistent with the findings of Subramaniam et al. (2011), who noted that large firms have better access to capital markets, reducing their need for high cash reserves. Consequently, CEOs of larger banking firms may adopt more aggressive investment or dividend payout strategies rather than stockpiling cash. This suggests that CEO tenure and firm size interplay is crucial in understanding corporate cash-holding policies, particularly in regulated industries like banking. While long-serving CEOs may accumulate valuable strategic experience, their leadership style may lean towards capital efficiency rather than precautionary liquidity management. This finding emphasizes the importance of corporate governance mechanisms in ensuring liquidity decisions align with broader financial stability objectives, especially in industries where cash management is critical in operational resilience.

The findings indicate that CEO age does not significantly affect corporate cash holdings, contradicting the initial hypothesis (H2), which predicted a strong relationship between CEO age and liquidity management. When analyzed through the lens of upper echelons theory (Hambrick & Mason, 1984), which asserts that organizational outcomes reflect top executives' characteristics. This result suggests that age alone is not a decisive factor in cash-holding decisions. Instead, a more nuanced perspective is required to account for the interaction between CEO experience, strategic decision-making processes, and external governance mechanisms.

Upper echelons theory posits that observable demographic characteristics, including age, tenure, functional background, and education, shape managerial decisions by influencing how executives interpret and respond to strategic challenges. In the context of cash management, it was initially assumed that older CEOs might adopt a more conservative approach, favoring higher cash reserves due to their risk aversion and preference for financial stability. Conversely, younger CEOs were expected to exhibit greater risk-taking behavior, potentially leading to lower cash reserves. However, the empirical evidence does not support this dichotomy, indicating that age alone cannot predict corporate liquidity strategies.

One possible explanation for this finding is that experience, and industry-specific knowledge are more dominant in financial decision-making than chronological age. As executives gain experience, they develop a broader strategic vision, better financial acumen, and deeper insights into industry dynamics, all of which influence their approach to liquidity management. Serfling, (2014) and Yim (2013) argue that strategic decision-making, particularly in investment and cash management, is more closely tied to executive experience and leadership style than age. This suggests that younger CEOs with extensive industry exposure may exhibit similar decision-making tendencies as their older counterparts, leading to no significant differences in cash-holding preferences.

Corporate cash holdings are also shaped by collective decision-making rather than individual CEO preferences. The upper echelons perspective must be interpreted in the context of organizational governance structures, where liquidity strategies are influenced by CFOs, boards of directors, and financial committees rather than solely determined by the CEO's characteristics. Gupta (2022) and Yeoh & Hooy (2022) emphasize that financial decisions, particularly in banking firms, result from collaborative processes integrating diverse perspectives, reducing the likelihood of CEO age exerting a direct impact on cash reserves.

External environmental factors further complicate the relationship between CEO age and cash holdings. Market conditions, interest rates, industry regulations, and firm-specific liquidity constraints substantially influence corporate cash policies, often outweighing individual executive traits. Under strict regulatory oversight from the Financial Services Authority (OJK), the Indonesian banking sector imposes capital adequacy and risk management requirements that significantly shape liquidity decisions. Belenzon et al. (2019) argue that firms must remain adaptable to macroeconomic conditions, regulatory shifts, and industry competition, reinforcing that CEO age is not a primary driver of cash-holding decisions.

Effectively managing cash holdings is crucial in ensuring a company's long-term financial stability, particularly in an increasingly complex and dynamic business environment. The finding that CEO education has a significant positive effect on corporate cash holdings aligns with Hypothesis 3 (H3), which posits that higher levels of education equip CEOs with enhanced financial knowledge and strategic decision-making capabilities. When analyzed through the lens of upper echelons theory (Hambrick & Mason, 1984), this result reinforces the idea that executive education shapes managerial cognition, influencing how financial strategies are formulated and executed.

CEOs with advanced educational backgrounds, particularly those who have attended prestigious institutions, tend to develop strong analytical skills, financial literacy, and risk management expertise, enabling them to make more informed and proactive liquidity decisions.

A well-educated CEO is likelier to understand complex financial instruments, capital allocation models, and economic trends, allowing them to optimize cash holdings as a liquidity buffer and strategic asset. Research by Barker & Mueller (2002) suggests that CEOs with higher educational attainment exhibit greater financial sophistication, allowing them to balance the need for precautionary savings with investment in growth opportunities. This supports the argument that education enhances a CEO's ability to assess risks and returns, leading to more effective cash management policies. Moreover, studies such as Custódio & Metzger (2014) emphasize that highly educated executives are more adept at implementing modern financial practices and risk management frameworks, which can help firms mitigate volatility while ensuring sufficient liquidity for operational resilience.

Beyond financial expertise, CEO education also contributes to broader leadership and strategic competencies, influencing how cash management policies align with the company's long-term objectives. Highly educated CEOs often cultivate extensive professional networks, granting them access to valuable market insights, strategic partnerships, and external financing opportunities. This access can facilitate more favorable borrowing conditions, enhanced investor confidence, and improved capital market positioning, indirectly contributing to optimized cash reserves. The findings of Bertrand & Schoar (2003) highlight that CEOs with strong academic backgrounds often leverage their networks to secure better financing terms, reducing dependency on internal cash holdings while ensuring financial stability.

Additionally, education is key to fostering innovation and adaptability in financial decision-making. CEOs with advanced education are more likely to embrace new technologies, implement data-driven decision-making processes, and adopt innovative liquidity management techniques. These capabilities allow firms to remain competitive in rapidly evolving markets while maintaining a strategic balance between liquidity and investment. Highly educated executives tend to integrate broader macroeconomic perspectives into their financial policies, resulting in more adaptive and forward-thinking cash management strategies (Nawaz, 2022).

From a governance and stakeholder perspective, a CEO's educational background affects corporate credibility and investor perception. A CEO with strong academic credentials is often perceived as more trustworthy, competent, and capable of executing sound financial strategies, which can positively influence stock market performance, credit ratings, and institutional investor confidence. This credibility advantage enables firms to secure external financing on favorable terms, reducing the need for excessive cash holdings while maintaining sufficient liquidity buffers to navigate uncertain market conditions. Empirical studies such as Kaplan et al. (2012) suggest that firms led by highly educated CEOs tend to attract greater investor interest and sustain higher firm valuations, reinforcing the broader strategic value of education in executive decision-making.

This finding suggests that CEO education plays a pivotal role in shaping corporate cash-holding policies, not only through enhanced financial expertise but also through expanded networks, improved access to capital, and a greater ability to align liquidity management with strategic objectives. While financial constraints, industry regulations, and market conditions still influence cash reserves, the CEO's educational background is an important determinant in optimizing liquidity strategies, ensuring that firms remain financially secure and competitively agile. These results further validate upper echelons theory, demonstrating that educational attainment is critical to executive decision-making, influencing financial policies and broader corporate performance outcomes.

The finding that female CEOs negatively influence corporate cash holdings is particularly intriguing, as it contradicts Hypothesis 4 (H4), which initially posited a positive association between female leadership and higher liquidity reserves. When viewed through the upper echelons theory (Hambrick & Mason, 1984), which asserts that executive characteristics shape corporate outcomes, this result suggests that gender-related financial decision-making is more complex than previously assumed. While existing literature frequently associates female CEOs with greater financial prudence and risk aversion, the observed reduction in cash holdings under female leadership implies a different strategic approach to liquidity management.

One possible explanation is that female CEOs prioritize efficient capital utilization rather than accumulating excess cash as a precautionary measure. Research on gender and financial decision-making highlights that women in leadership roles often adopt a conservative stance toward risk-taking (Giannikos & Korkou, 2022; Shropshire et al., 2021). This suggests that female executives would be more inclined to hold higher cash reserves. However, the empirical findings indicate that female CEOs may focus on active cash deployment in productive investments, debt repayment, or operational enhancements rather than passive cash accumulation. This aligns with the findings of Faccio et al. (2016), who suggest that female executives exercise stricter financial discipline and allocate liquidity toward strategic uses rather than hoarding excess cash.

Another perspective that may explain this contradiction is female CEOs' unique professional and social pressures. Women in executive positions frequently encounter higher expectations and scrutiny regarding their leadership effectiveness and financial acumen, particularly in male-dominated industries (M.-H. Lim & Chung, 2021; Rigolini & Huse, 2021). Female CEOs may implement more visible and strategic financial decisions to establish credibility, such as investing cash into corporate growth, research and development, or shareholder returns, rather than maintaining high cash balances that could be perceived as inefficient resource management. This need

to demonstrate proactive financial leadership may drive female executives to structure corporate liquidity policies emphasizing capital efficiency rather than cash retention.

Beyond leadership style and external expectations, the industry-specific environment in which these CEOs operate may also shape their cash management decisions. In the Indonesian banking sector, regulatory frameworks impose clear guidelines on capital adequacy, liquidity requirements, and risk exposure, which may reduce the discretionary role of individual CEOs in determining cash holdings. If female-led firms demonstrate strong risk-mitigation strategies through diversified investments and capital planning, this could naturally result in lower cash reserves without increasing financial vulnerability. This is consistent with J. Huang & Kisgen (2013), who found that female executives tend to exhibit more deliberate and calculated financial decision-making, emphasizing sustainable growth rather than liquidity hoarding.

Another possible explanation relates to investment priorities. Research suggests that firms with female CEOs may emphasize long-term value creation, innovation, and sustainability initiatives, leading to lower retained cash balances and higher strategic investments. Adams & Funk (2012) found that female executives are often more focused on responsible resource allocation than excessive risk avoidance, which may explain why female-led firms do not necessarily maintain higher cash reserves. Instead of using liquidity as a protective measure, they may ensure financial security through diversified asset management and long-term corporate planning.

This finding challenges the traditional assumption that female leadership is inherently linked to higher cash holdings due to risk aversion. Instead, the evidence suggests that female CEOs adopt a more structured and goal-oriented approach to liquidity management, ensuring that available cash is actively utilized to enhance firm value. This reinforces the view that executive decision-making is shaped by multiple dimensions beyond gender, including strategic preferences, corporate culture, and external business environments. In the context of upper echelons theory, this result indicates that while demographic characteristics influence leadership styles, financial decisions are ultimately driven by a CEO's broader strategic vision and approach to resource optimization.

CONCLUSIONS

This study provides a deeper understanding of how CEO demographics influence cash management strategies in the Indonesian banking industry, particularly regarding the varying effects of CEO tenure, age, education, and gender. The finding that CEO tenure negatively affects firm cash reserves suggests that longer-tenured CEOs may be more conservative and exhibit stronger reliance on established risk management frameworks, leading to liquidity optimization rather than excessive cash accumulation. This aligns with the notion that experienced CEOs, rather than hoarding cash, may utilize strategic capital allocation to enhance financial efficiency. Contrary to expectations, CEO age does not strongly affect cash holdings, implying that corporate liquidity decisions are shaped more by experience, firm structure, and the collective governance of top management teams rather than by age alone. Meanwhile, CEOs with higher levels of education tend to retain more cash, which could stem from greater financial expertise, broader professional networks, and a more advanced understanding of risk mitigation strategies. An interesting and counterintuitive result is female CEOs' negative effect on cash holdings, which may be attributed to a more structured approach to liquidity and investment or external pressures that compel female leaders to exhibit stricter financial discipline and resource optimization.

This research extends upper echelons theory by demonstrating that CEO demographic attributes interact with regulatory and organizational contexts in shaping financial policies. Unlike traditional assumptions that CEO traits uniformly affect corporate strategies, this study highlights that tenure and education have consistent effects. In contrast, age does not, reinforcing that individual characteristics alone do not dictate financial decisions but operate within institutional constraints. Additionally, this study contributes to the corporate finance literature on liquidity management by revealing that cash holdings policies are not merely a function of institutional risk considerations but are also shaped by top executives' strategic preferences and leadership styles.

From a practical perspective, the findings offer valuable insights for regulators, bank supervisors, boards of directors, and investors. Regulators and banking authorities can incorporate CEO leadership characteristics into their performance assessments, allowing for more adaptive and scalable liquidity policies tailored to executive decision-making tendencies. Boards of directors can use these insights in CEO selection and evaluation processes, recognizing that long-tenured CEOs tend to optimize capital structure. In contrast, CEOs with higher education levels may adopt more calculated liquidity strategies. Investors can benefit from understanding how CEO demographics influence corporate responses to market uncertainties and investment opportunities, where a leader's educational background and leadership experience may serve as indicators of a firm's liquidity stance, whether prioritizing financial security or expansionary growth.

Despite its contributions, this study acknowledges certain limitations. The findings are based on the Indonesian banking sector, which operates under stringent liquidity regulations that may not directly apply to industries with more flexible financial policies. Future research could explore whether these CEO-demographic patterns hold across different regulatory environments or industries, including insurance, utilities, and non-financial corporations. Additionally, incorporating psychological dimensions such as overconfidence, risk aversion, or cognitive biases could provide a more nuanced understanding of how intrinsic executive characteristics interact with experience,

corporate culture, and governance structures in shaping financial policies. Expanding the scope to a cross-country comparative analysis could also help assess whether institutional frameworks yield similar CEO-driven liquidity behaviors in other regions. By integrating these additional factors, future research can develop a more comprehensive perspective on the role of executive leadership in determining corporate liquidity strategies.

REFERENCES

Adams, R. B., & Funk, P. (2012). Beyond the glass ceiling: Does gender matter? *Management Science*, *58*(2), 219–235. https://doi.org/10.1287/mnsc.1110.1452

Aktas, N., Louca, C., & Petmezas, D. (2019). CEO overconfidence and the value of corporate cash holdings. *Journal of Corporate Finance*, *54*, 85–106. https://doi.org/10.1016/j.jcorpfin.2018.11.006

Alnori, F. (2020). Do they boost or hurt firms' performance? Evidence from listed non-financial firms in Saudi Arabia. *International Journal of Islamic and Middle Eastern Finance and Management*, *13*(5), 919–934. https://doi.org/10.1108/imefm-08-2019-0338

Ariff, A. M., Jaafar, A., & Kamarudin, K. A. (2022). Political stability, board tenure, and corporate cash holding. *Journal of International Accounting Research*, *21*(3), 1–22. https://doi.org/10.2308/JIAR-2021-011

Armstrong, A. (2011). An assessment of the independent commission on banking's recommendations. *National Institute Economic Review*, *218*, F4–F12. https://doi.org/10.1177/002795011121800108

Atif, M., Liu, B., & Huang, A. (2019). Does board gender diversity affect corporate cash holdings? *Journal of Business Finance & Accounting*, *46*(7–8), 1003–1029. https://doi.org/https://doi.org/10.1111/jbfa.12397

Barker, V. L., & Mueller, G. C. (2002). CEO characteristics and firm R&D spending. *Management Science*, *48*(6), 782–801. https://doi.org/10.1287/mnsc.48.6.782.187

Belenzon, S., Shamshur, A., & Zarutskie, R. (2019). CEO's age and the performance of closely held firms. *Strategic Management Journal*, *40*(6), 917–944. https://doi.org/https://doi.org/10.1002/smj.3003

Belkhir, M., Boubaker, S., & Chebbi, K. (2018). CEO inside debt and the value of excess cash. *Journal of Applied Accounting Research*, *19*(2), 225–244. https://doi.org/10.1108/jaar-02-2017-0028

Bertrand, M., & Schoar, A. (2003). Managing with style: The effect of managers on firm policies. *The Quarterly Journal of Economics*, *118*(4), 1169–1208. https://doi.org/10.1162/003355303322552775

Bose, S., Khan, H. Z., Rashid, A., & Islam, S. (2018). What drives green banking disclosure? An institutional and corporate governance perspective. *Asia Pacific Journal of Management*, *35*(2), 501–527. https://doi.org/10.1007/s10490-017-9528-x

Boubaker, S., Clark, E., & Mefteh-Wali, S. (2020). Does the CEO elite education affect firm hedging policies? *The Quarterly Review of Economics and Finance*, *77*, 340–354. https://doi.org/https://doi.org/10.1016/j.qref.2019.11.004

Cambrea, D. R., Tenuta, P., & Vastola, V. (2020). Female directors and corporate cash holdings: monitoring vs executive roles. *Management Decision*, *58*(2), 295–312. https://doi.org/10.1108/MD-11-2018-1289

Chada, S., & Varadharajan, G. T. (2023). Earnings quality, institutional investors and corporate cash holdings: Evidence from India. *International Journal of Managerial Finance*, *20*(1), 247–277. https://doi.org/10.1108/ijmf-05-2022-0224

Chang, C.-C., & Yang, H. (2022). The role of cash holdings during financial crises. *Pacific-Basin Finance Journal*, *72*, 101733. https://doi.org/https://doi.org/10.1016/j.pacfin.2022.101733

Chen, Y.-R. (2008). Corporate governance and cash holdings: Listed new economy versus old economy firms. *Corporate Governance an International Review*, *16*(5), 430–442. https://doi.org/10.1111/j.1467-8683.2008.00701.x

Chen, Y.-R., Ho, K.-Y., & Yeh, C.-W. (2020). CEO overconfidence and corporate cash holdings. *Journal of Corporate Finance*, *62*, 101577. https://doi.org/https://doi.org/10.1016/j.jcorpfin.2020.101577

Colak, G., & Liljeblom, E. (2022). Easy cleanups or forbearing improvements: The effect of CEO tenure on successor's performance. *Journal of Financial Stability*, *63*, 101072. https://doi.org/https://doi.org/10.1016/j.jfs.2022.101072

Custódio, C., & Metzger, D. (2014). Financial expert CEOs: CEO's work experience and firm's financial policies. *Journal of Financial Economics*, *114*(1), 125–154. https://doi.org/10.1016/j.jfineco.2014.06.002

Dimitropoulos, P., Koronios, K., Thrassou, A., & Vrontis, D. (2020). Cash holdings, corporate performance and viability of Greek SMEs: Implications for stakeholder relationship management. *EuroMed Journal of Business*, *15*(3), 333–348. https://doi.org/10.1108/EMJB-08-2019-0104

Doan, T., & Iskandar-Datta, M. (2020). Are female top executives more risk-averse or more ethical? Evidence from corporate cash holdings policy. *Journal of Empirical Finance*, *55*, 161–176. https://doi.org/https://doi.org/10.1016/j.jempfin.2019.11.005

Egerová, D., & Nosková, M. (2019). Top management team composition and financial performance: Examining the role of gender diversity. In *Business Administration and Management*. https://doi.org/10.15240/tul/001/2019-2-009

Elnahas, A., Hossain, M. N., & Javadi, S. (2023). CEO marital status and corporate cash holdings. *European Financial Management*, *30*(1), 187–229. https://doi.org/10.1111/eufm.12413

Faccio, M., Marchica, M. T., & Mura, R. (2016). CEO gender, corporate risk-taking, and the efficiency of capital allocation. *Journal of Corporate Finance*, *39*, 193–209. https://doi.org/10.1016/j.jcorpfin.2016.02.008

Feng, X., Lo, Y. L., & Chan, K. C. (2022). Impact of economic policy uncertainty on cash holdings: firm-level evidence from an emerging market. *Asia-Pacific Journal of Accounting & Economics*, *29*(2), 363–385.

Gao, N. (2015). The motives of cash reserve and bidder cash reserve effects. *International Review of Financial Analysis*, *37*, 73–88. https://doi.org/10.1016/j.irfa.2014.11.007

Ghardallou, W. (2022). Corporate sustainability and firm performance: The moderating role of CEO education and tenure. *Sustainability*, *14*(6), 1–16. https://doi.org/10.3390/su14063513

Giannikos, C. I., & Korkou, E. (2022). Gender differences in risk-taking investment strategies in defined contribution plans. *Journal of Risk and Financial Management*, *15*(5), 1–18. https://doi.org/10.3390/jrfm15050220

Gill, A., & Shah, C. (2012). Determinants of corporate cash holdings: Evidence from Canada. *International Journal of Economics*

and Finance, *4*(1), 70–79. https://doi.org/10.5539/ijef.v4n1p70
Gupta, G. (2022). CEO's age and investment-cash flow sensitivity. *Managerial and Decision Economics*, *43*(6), 2212–2224. https://doi.org/https://doi.org/10.1002/mde.3519
Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, *9*(2), 193–206. https://doi.org//10.5465/amr.1984.4277628
Hapsari, D. W., & Norris, N. R. (2022). Determinant of cash holding. *Jurnal Akuntansi*, *26*(3), 358–373. https://doi.org/10.24912/ja.v26i3.960
Hassanein, A., & Kokel, A. (2019). Corporate cash hoarding and corporate governance mechanisms: Evidence from Borsa Istanbul. *Asia-Pacific Journal of Accounting & Economics*, *29*(3), 831–848. https://doi.org/10.1080/16081625.2019.1617753
Houqe, M. N., Monem, R. M., & van Zijl, T. (2023). Business strategy, cash holdings, and dividend payouts. *Accounting & Finance*, *63*(4), 3999–4035. https://doi.org/10.1111/acfi.13082
Hu, J., Li, A., & Luo, Y. (2019). CEO early life experiences and cash holding: Evidence from China's great famine. *Pacific-Basin Finance Journal*, *57*, 101184. https://doi.org/10.1016/j.pacfin.2019.101184
Huang, H.-W., Rose-Green, E., & Lee, C.-C. (2012). CEO age and financial reporting quality. *Accounting Horizons*, *26*(4), 725–740. https://doi.org/10.2308/acch-50268
Huang, J., & Kisgen, D. J. (2013). Gender and corporate finance: Are male executives overconfident relative to female executives? *Journal of Financial Economics*, *108*(3), 822–839. https://doi.org/10.1016/j.jfineco.2012.12.005
Huang, W., Lambertides, N., & Steeley, J. M. (2015). Motives for corporate cash holdings: The CEO optimism effect. *Review of Quantitative Finance and Accounting*, *47*, 699–732. https://doi.org/10.1007/s11156-015-0517-1
Jiang, H., & Kim, E. Y. (2022). Characteristics of top management team and Chinese tax planning nexus: Findings from a fuzzy-set qualitative comparative analysis. *Frontiers in Psychology*, *13*, 964278. https://doi.org/10.3389/fpsyg.2022.964278
Kaplan, S. N., Klebanov, M. M., & Sorensen, M. (2012). Which CEO characteristics and abilities matter? *Journal of Finance*, *67*(3), 973–1007. https://doi.org/10.1111/j.1540-6261.2012.01739.x
Kariuki, S. N., Namusonge, G. S., & Orwa, G. O. (2015). *Moderating effect of ceo tenure and managerial experience on firm specific determinants of corporate cash holdings*.
Kirkpatrick, G. (2009). The corporate governance lessons from the financial crisis. *OECD Journal: Financial Market Trends*, *2009*(1), 61–87.
Kusumawardani, A., Yudaruddin, R., & Yudaruddin, Y. A. (2021). Corporate governance's policy on the impact of cash holding in Indonesia. *Universal Journal of Accounting and Finance*, *9*(4), 594–603. https://doi.org/10.13189/ujaf.2021.090407
Le, T. D., & Ngo, T. (2020). The determinants of bank profitability: A cross-country analysis. *Central Bank Review*, *20*(2), 65–73. https://doi.org/10.1016/j.cbrev.2020.04.001
Le, T. N. (2022). The influence of female leadership on the cash holdings of listed companies in Vietnam. *International Journal of Advanced and Applied Sciences*, *9*(8), 55–64. https://doi.org/10.21833/ijaas.2022.08.007
Lee, S. C., & Lim, J. (2021). Effects of CEO characteristics on the relationship between excess cash holdings and audit effort. *Applied Economics*, *53*(25), 2905–2929. https://doi.org/10.1080/00036846.2020.1870653
Li, W., Chen, X., & Yuan, T. (2023). Green credit policy and corporate cash holdings: Evidence from China. *Accounting and Finance*, *63*, 2875–2903. https://doi.org/10.1111/acfi.13021
Lim, J., & Lee, S. C. (2019). Relationship Between the Characteristics of CEOs and Excess Cash Holdings of Firms. *Emerging Markets Finance and Trade*, *55*(5), 1069–1090. https://doi.org/10.1080/1540496X.2018.1518778
Lim, M.-H., & Chung, J. Y. (2021). The effects of female chief executive officers on corporate social responsibility. *Managerial and Decision Economics*, *42*(5), 1235–1247. https://doi.org/https://doi.org/10.1002/mde.3304
Liu, C., & Jiang, H. (2020). Impact of CEO characteristics on firm performance: evidence from China listed firms. *Applied Economics Letters*, *27*(14), 1–5. https://doi.org/10.1080/13504851.2019.1607965
Loi, F. L., Chen, J. J., & Qiao, Z. (2023). CEO cultural background and corporate cash holdings. *Accounting and Finance*, *63*(1), 1069–1100. https://doi.org/10.1111/acfi.13019
Magerakis, E., Gkillas, K., Tsagkanos, A., & Siriopoulos, C. (2020). Firm size does matter: New evidence on the determinants of cash holdings. *Journal of Risk and Financial Management*, *13*(8), 1–33. https://doi.org/10.3390/jrfm13080163
Magerakis, E., & Habib, A. (2021). Environmental uncertainty and corporate cash holdings: The moderating role of CEO ability. *International Review of Finance*, *22*(3), 402–432. https://doi.org/10.1111/irfi.12355
McNulty, T., Florackis, C., & Ormrod, P. (2013). Boards of directors and financial risk during the credit crisis. *Corporate Governance: An International Review*, *21*(1), 58–78. https://doi.org/10.1111/corg.12007
Muien, H. M., Nordin, S., & Badru, B. O. (2022). Effect of CEO reputation on company financial distress: Evidence from Pakistan. *Global Business Management Review (Gbmr)*, *14*(1), 38–53. https://doi.org/10.32890/gbmr2022.14.1.3
Mun, S., Han, S. H., & Seo, D. (2020). The impact of CEO educational background on corporate cash holdings and value of excess cash. *Pacific-Basin Finance Journal*, *61*, 101339. https://doi.org/https://doi.org/10.1016/j.pacfin.2020.101339
Nawaz, T. (2022). What's in an education? Implications of CEO education for financial inclusion. *International Journal of Finance and Economics*, *27*(3), 3741–3753. https://doi.org/10.1002/ijfe.2348
Nylund, P. A., Arimany-Serrat, N., Ferras-Hernandez, X., Viardot, E., Boateng, H., & Brem, A. (2020). Internal and external financing of innovation: Sectoral differences in a longitudinal study of European firms. *European Journal of Innovation Management*, *23*(2), 200–213. https://doi.org/10.1108/EJIM-09-2018-0207
Orens, R., & Reheul, A.-M. (2013). Do CEO demographics explain cash holdings in SMEs? *European Management Journal*, *31*(6), 549–563. https://doi.org//10.1016/j.emj.2013.01.003
Petria, N., Capraru, B., & Ihnatov, I. (2015). Determinants of banks' profitability: evidence from EU 27 banking systems. *Procedia Economics and Finance*, *20*(15), 518–524. https://doi.org/10.1016/s2212-5671(15)00104-5
Pinkowitz, L., Stulz, R. M., & Williamson, R. (2006). Does the contribution of corporate cash holdings and dividends to firm value depend on governance? A cross-country analysis. *The Journal of Finance*, *61*(6), 2725–2751. https://doi.org/10.1111/j.1540-6261.2006.01003.x

Rao, Y., Zhu, X., Sun, Y., & Qian, X. (2024). CEOs' knowledge integration, entrepreneurship, and corporate innovation: Evidence for China. *International Review of Financial Analysis*, *91*, 102963. https://doi.org/https://doi.org/10.1016/j.irfa.2023.102963

Rigolini, A., & Huse, M. (2021). Women and multiple board memberships: social capital and institutional pressure. *Journal of Business Ethics*, *169*(3), 443–459. https://doi.org/10.1007/s10551-019-04313-6

Sah, N. B. (2021). Cash is Queen: Female CEOs' propensity to hoard cash. *Journal of Behavioral and Experimental Finance*, *29*, 100412. https://doi.org/https://doi.org/10.1016/j.jbef.2020.100412

Saidu, S. (2019). CEO characteristics and firm performance: focus on origin, education and ownership. *Journal of Global Entrepreneurship Research*, *9*(1), 29. https://doi.org/10.1186/s40497-019-0153-7

Schroeder, P., & Kacem, I. (2020). Competitive difference analysis of the cash management problem with uncertain demands. *European Journal of Operational Research*, *283*(3), 1183–1192. https://doi.org//10.1016/j.ejor.2019.11.065

Serfling, M. A. (2014). CEO age and the riskiness of corporate policies. *Journal of Corporate Finance*, *25*, 251–273. https://doi.org/https://doi.org/10.1016/j.jcorpfin.2013.12.013

Shi, W., Pathak, S., Song, L. J., & Hoskisson, R. E. (2018). The adoption of chief diversity officers among S&P 500 firms: Institutional, resource dependence, and upper echelons accounts. *Human Resource Management*, *57*(1), 83–96. https://doi.org/10.1002/hrm.21837

Shropshire, C., Peterson, S., Bartels, A. L., Amanatullah, E. T., & Lee, P. M. (2021). Are female CEOs really more risk averse? Examining economic downturn and other-orientation. *Journal of Leadership & Organizational Studies*, *28*(2), 185–206. https://doi.org/10.1177/1548051821997404

Subramaniam, V., Tang, T. T., Yue, H., & Zhou, X. (2011). Firm structure and corporate cash holdings. *Journal of Corporate Finance*, *17*(3), 759–773. https://doi.org/https://doi.org/10.1016/j.jcorpfin.2010.06.002

Suherman, S., Usman, B., Mahfirah, T. F., & Vesta, R. (2021). Do female executives and CEO tenure matter for corporate cash holdings? Insight from a Southeast Asian Country. *Corporate Governance*, *21*(5), 939–960. https://doi.org/10.1108/cg-07-2020-0290

Tong, Z. (2010). CEO Risk Incentives and Corporate Cash Holdings. *Journal of Business Finance & Accounting*, *37*(9), 1248–1280. https://doi.org/10.1111/j.1468-5957.2010.02208.x

Tosun, O. K., El Kalak, I., & Hudson, R. (2022). How female directors help firms to attain optimal cash holdings. *International Review of Financial Analysis*, *80*, 102034. https://doi.org/https://doi.org/10.1016/j.irfa.2022.102034

Ullah, S., & Kamal, Y. (2017). Board characteristics, political connections, and corporate cash holdings: the role of firm size and political regime. *Business & Economic Review; Vol 9 No 1 (2017): March 2017*, *9*(1), 157–179.

Xu, J., Yun, K., Fu, Y., Jang, P., Kim, J., & Pang, C. (2019). A study on the effect of TMT characteristics and vertical dyad similarity on enterprise achievements. *Sustainability*, *11*(10), 2913. https://doi.org/10.3390/su11102913

Xu, X., Li, W., Li, Y., & Liu, X. (2019). Female CFOs and corporate cash holdings: Precautionary motive or agency motive? *International Review of Economics & Finance*, *63*, 434–454. https://doi.org/https://doi.org/10.1016/j.iref.2019.05.006

Yeoh, S.-B., & Hooy, C.-W. (2022). CEO age and cash holdings around the world: The moderating role of legal origin. *Journal of Corporate Finance Research / Корпоративные Финансы | ISSN: 2073-0438*, *16*(4 SE-Новые исследования). https://doi.org/10.17323/j.jcfr.2073-0438.16.4.2022.46-60

Yim, S. (2013). The acquisitiveness of youth: CEO age and acquisition behavior. *Journal of Financial Economics*, *108*(1), 250–273. https://doi.org/https://doi.org/10.1016/j.jfineco.2012.11.003

Yoon, B., Lee, J.-H., & Cho, J.-H. (2021). The effect of esg performance on tax avoidance—evidence from Korea. *Sustainability*, *13*(12), 1–16. https://doi.org/10.3390/su13126729

Zeng, S., & Wang, L. (2015). CEO gender and corporate cash holdings. Are female CEOs more conservative? *Asia-Pacific Journal of Accounting & Economics*, *22*(4), 449–474. https://doi.org/10.1080/16081625.2014.1003568

Zhang, L., Xu, Y., & Chen, H. (2022). Do returnee executives value corporate philanthropy? Evidence from China. *Journal of Business Ethics*, *179*(3), 411–430. https://doi.org/10.1007/s10551-021-04870-9

Zhao, X.-F., & Ma, H. (2017). Chief executive officer succession and financial constraints: evidence from China. *Asia-Pacific Journal of Financial Studies*, *46*(4), 583–608. https://doi.org/10.1111/ajfs.12181

Zhou, M., Chen, F., & Chen, Z. (2021). Can CEO education promote environmental innovation: Evidence from Chinese enterprises. *Journal of Cleaner Production*, *297*, 126725. https://doi.org/https://doi.org/10.1016/j.jclepro.2021.126725