

The Effect of Board Characteristics on Firm Performance with Intellectual Capital as a Moderating Variable (An Empirical Study of Conventional Commercial Bank Companies on the Indonesia Stock Exchange in 2019–2023)

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Abstract: In the traditional commercial banking industry, this study attempts to provide empirical data about the impact of board size and gender diversity on business performance, using intellectual capital as a moderating variable. The research population includes all companies in the conventional commercial bank sector as many as 39 companies, with purposive sampling technique resulting in 36 companies as samples. The analysis methods used include descriptive statistical analysis, classical assumption test, multiple linear regression analysis, and moderation regression analysis. Multiple linear regression results demonstrate that board size significantly and favourably affects business success, while gender diversity has no significant effect. In addition, moderation regression analysis results demonstrate that intellectual capital can fortify the relationship between board size and company performance, but does not strengthen the connection between business performance and gender diversity.

Keywords: Board Size; Firm Performance; Gender Diversity; Intellectual Capital

1. Introduction

Company performance is a crucial sign in evaluating the capacity of a business to achieve operational, financial, and strategic goals within a certain period of time. From a management and accounting perspective, company performance reflects the end result of resource management efforts, including the implementation of strategies by management in creating profits, maintaining business continuity, and forming positive perceptions from shareholders and stakeholders towards the worth of the business. Financial metrics like Return on Equity (ROE), Return on Assets (ROA), and Net Profit Margin (NPM) show this performance measurement, as well as non-financial indicators such as innovation, operational efficiency, and client contentment.

In the banking sector, company performance plays a central role in reflecting financial strength, stability, and competitiveness in the market. Superior performance is an absolute requirement to maintain public trust, considering that banks play a crucial part in managing public funds and maintaining the stability of the financial system (Doni et al., 2022). The credibility of a bank is largely determined by its accountable, healthy, and sustainable performance.

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The importance of maintaining stable bank performance not only impacts the image of the financial institution itself, but also influences people's decisions in choosing a place to save funds and access financing. Bank failure to fulfill financial obligations, such as returning customer funds or paying off credit, reflects poor performance and can reduce customer trust. On the other hand, investors tend to place their capital in banks that show good performance, in order to ensure optimal investment returns (Honi et al., 2020). Thus, maintaining bank performance is important in maintaining public trust and creating sustainable economic stability.

As a basis for understanding, it is necessary to review the definition and function of a bank in accordance with 1998 Law No. 10. A bank is a type of business that takes deposits from the general public and uses those funds to raise people's standards of life. The function of a bank is not only as a distributor of funds, but also as a provider of collateral in credit and an intermediary for transferring funds between parties, from low interest rates to higher interest rates. This vital role makes it clear why bank performance is very important in determining the stability of the national economy.

To assess bank performance objectively, a financial measurement tool is needed that can show the institution's ability to manage assets in order to make a profit. One of the most frequently used indicators is Return on Assets (ROA). Although the Indonesian banking sector has shown positive growth, challenges remain, especially during and after the COVID-19 pandemic. OJK data indicates pressure on profitability indicators such as ROA, which are influenced by declining asset quality, increasing operational costs, and global economic instability.

These conditions encourage the significance of identifying various elements that may have an impact on banking performance, both externally and internally. One internal factor that is increasingly being considered is the characteristics of the directors' board. These characteristics include attributes inherent in the board that influence the effectiveness of corporate governance is the process of making strategic decisions. The board of directors is responsible for setting policy direction, overseeing management, and determining important company decisions. Therefore, the composition and quality of the board are important keys in driving company performance. In the context of this study, the board characteristics analyzed include board size and gender diversity, which are believed to enrich perspectives in decision-making and improve response to complex business dynamics.

In addition, intellectual capital is also an important element that is often overlooked. Intangible assets are referred to as intellectual capital owned by a business and contributes significantly to value creation and sustainable competitive advantage. This capital includes various aspects such as knowledge, skills, experience, and networks owned by the company and is not directly reflected in the financial statements (Listianawati & Sampurno, 2021). According to the International Federation of Accountants (IFAC), three primary categories

comprise intellectual capital: human capital (human resource competence and creativity), structural capital (internal systems and processes), and customer capital (relationships with customers and business partners). If not managed effectively, the company's innovation and productivity potential will be difficult to maximize. In the banking industry, where service and technology innovation are the main differentiators, the existence and management of intellectual capital becomes very crucial.

2. Literature Review

2.1 Agency theory

Agency theory proposed by Jensen and Meckling (1976) explains the dynamics between company owners (principals) and managers (agents). In this relationship, there is often a mismatch of interests because management tends to pursue personal goals, which can be different from the interests of the owners of capital. This mismatch raises agency costs, which are costs incurred to monitor, regulate, or bind management to keep it in line with the interests of the owner. To reduce these conflicts, this theory emphasizes the importance of using contracts as a tool to unify the goals between principals and agents.

Eisenhardt in Triuwono (2018) states that agency theory rests on three basic assumptions: humans are opportunistic and tend to avoid risk, organizations are prone to conflict and unbalanced information, and information is considered an asset of strategic value. The two main issues that arise in agency relationships are adverse selection and moral hazard. To overcome this, a strong supervisory system is needed, such as the presence of a board of directors responsible for monitoring management. Noveliza (2020) reveals that the higher the need for supervision, the greater the agency costs that arise. Therefore, management is encouraged to show optimal performance in order to reduce these costs and reduce the intensity of supervision, while increasing investor confidence in company management.

2.2 Resource-Based Theory

Resource-Based Theory (RBT) is an approach in strategic management that explains how companies can achieve competitive advantage through mastery of unique resources that competitors do not have. Introduced by Wernefelt in 1984 and influenced by Edith Penrose's thinking, this theory emphasizes the importance of having valuable, rare, difficult to imitate, and irreplaceable resources. This advantage is highly dependent on the company's ability to acquire, manage, and maintain these strategic assets. One form of such resources is intellectual capital, which is considered capable of adding value and supporting the implementation of corporate strategy in a sustainable manner (Wijayani, 2017).

2.3 Board of Director

The board of directors has complete control and accountability for the company's management and acts as a representative under certain conditions. The directors' board has a strategic role in setting policies, overseeing daily operations in compliance with the

association's articles and GMS decisions, under the supervision of the commissioners' board. To function effectively, the structure and composition of the board of directors must support efficient, accurate and independent decision-making. In addition to running the management, additionally the board of directors is involved in determining the direction and sustainability of the company.

2.4 Firm Performance

Firm performance is the result of managerial decisions taken on an ongoing basis to achieve strategic goals (Muhammad Asir et al., 2023). This performance reflects the effectiveness of individual or group behavior in the organization and shows the financial standing of the business, which is evaluated through various analysis of finances approaches (Sudarjo et al., 2024). The evaluation helps assess the efficiency of resource use, ensure the achievement of organizational targets, and measure the business's capacity to handle the dynamics of the business environment. This assessment is carried out periodically based on historical data, which is then used as the basis for planning and projecting future performance, thus becoming a indicator of the business's success managerial strategy.

2.5 Profitability

Kasmir in the journal Lase et al. (2022), financial ratios include the act of analyzing the relationship between values in financial statements, which is done by dividing one number by another, both in the same period and across periods. Meanwhile, Fernos (2017) states that the level of profitability serves to examine the company's success rate in achieving profit, and compares elements through financial statements such as the balance sheet as well as the income statement over several periods. Utilization of profitability ratios can be done in part or in whole, depending on management policy; the more ratios used, the more comprehensive the analysis results obtained.

2.6 Intellectual Capital

According to Bontis (2000) in Soewarno and Ramadhan (2020), Intellectual Capital (IC) is a collection of intangible resources, such as expertise as well as competencies, which are utilized to suppress performance improvement and generate added value for the company. Performance evaluation itself involves a way and system of evaluating the company's expertise in achieving predetermined standards. In the view of OECD (1999) cited by Ulum (2008), intellectual capital (IC) is human capital and structural capital are two types of intangible assets that provide economic value. Structural capital includes various elements supporting the company's operations, such as systems, supply chains, software, and distribution networks. In the meantime, human capital comprises the personnel within the organization, such as employees, as well as external parties that interact with the company, such as customers and suppliers (Ihyaul Ulum MD, 2008).

Pulic (2000) in Ulum (2014) developed the The company's intellectual capital performance is evaluated using the VAIC (Value Added Intellectual Capital) technique. Value

Added Capital Employed (VACA), Value Added Human Capital (VAHU), and Structural Capital Value Added (STVA) are the three primary indicators that make up VAIC, which is computed using financial statement data. Value Added (VA), a company's objective metric for gauging business success and value generation, is the model's main focus. VA is determined as the difference between input (operation expenses) and output (income from goods and services), with labor costs (employee limitations) excluded from the input because it is considered an investment in the intellectual potential of employees, not an ordinary cost (Ulum et al., 2014).

2.7 Leverage

In Novari and Lestari's research (2016), leverage is defined as the capacity of the business to fulfill both immediate and long-term financial demands, as measured by the ratio between total debt and owner's equity. Leverage is used to increase profits beyond the cost of assets and sources of funds, so as to increase shareholder returns. However, the use of leverage also carries risks, because fluctuations in income can cause a decrease in profits if revenue is unable to cover fixed costs.

2.8 Hypothesis Development

Board size can affect firm performance in two ways. First, a larger board brings a diversity of experience and networks that support strategic decision-making and effective oversight (Mishra & Kapil, 2018). Second, too large a size can slow down decisions and reduce efficiency. Queiri et al. (2021) found that a larger number of board members has a positive impact on ROA. Ali and Bin Nasir (2015) stated that the diversity of skills in a large board improves company performance. Fariha et al. (2022) added that a large board can reduce agency conflicts through tighter supervision. Potharla and Amirishetty (2021) also support that the addition of board members has a favorable impact on financial results. Therefore, the following are the study's hypotheses:

H1: Board Size Has a Positive Effect on Profitability.

Women on the board of directors can enhance the company's competitiveness, inventiveness, and decision-making quality, all of which can lead to better performance (Ahmadi et al., 2018). Dwaikat et al. (2021) state that women are effective in supervisory functions and contribute through experience and education. Bogdan et al. (2022) also discovered that executive teams with a gender diversity boost profitability because different viewpoints improve decision-making. Assenga et al. (2018), Fariha et al. (2022), and Karim et al. (2023) showed similar results, using ROA as an indicator of profitability. Based on this, the hypotheses in this research are:

H2: Gender Diversity of Directors Has a Positive Effect on Profitability.

Boards of directors are crucial in safeguarding the interests of shareholders through strategic decision-making. Well-formed and appropriately sized boards tend to be more effective in supervising managers, increasing shareholder value and encouraging the exchange

of innovative ideas. Companies with larger boards also find it easier to make external connections and secure important resources such as Intellectual Capital (IC) (Martinez-Ferrero et al., 2017). A large board size broadens viewpoints, offers more solutions, and maximizes IC capabilities. Dancaková and Glova (2024) support this with the finding that IC significantly improves the efficiency of firm performance, such as Return on Assets (ROA), in various industries. Based on this, the hypothesis of this study is:

H3: Intellectual Capital Strengthens the Effect of Board Size on Profitability.

Board diversity, as an important part of human capital (HC), affects firm performance. The presence of female directors strengthens supervisory effectiveness and encourages innovation through interactions that result in high-quality decisions (Toumi et al., 2016). In addition, diversity increases the board's ability to formulate a more comprehensive strategy, attract new talent, and make the company more adaptive to change and strengthen relationships with stakeholders (Al-Musali & Ku Ismail, 2016). Based on this, the hypothesis of this study is:

H4: Intellectual Capital Strengthens the Impact of Gender Diversity of Directors on Profitability.

3. Proposed Method

3.1 Data Types and Sources

For the 2019–2023 timeframe, this study makes use of secondary data from traditional commercial banks that are listed on the Indonesia Stock Exchange (IDX). Data came from the company's annual and financial reports, which were viewed on each company's own website and on the official IDX website, www.idx.co.id. Additional information was also collected from scientific journals, internet sites, and other relevant literature to support the analysis of this study.

3.2 Population and Sample

The study's population consisted of 39 traditional commercial banks that were listed between 2019 and 2023 on the IDX. The study employed a purposive sampling strategy because of time constraints. The following criteria were used to choose the sample: (1) conventional banks listed on the IDX during 2019-2023, (2) have IPO before 2019, and (3) consistently publish complete financial and annual reports during the period.

3.3 Research Variables

3.3.1 Dependent Variable

a. Profitability

ROA was chosen because it is able to expose the company's efficiency in obtaining net profit on the overall assets used in business operations. In the banking sector, assets such as loans and deposits are the main components in generating income. Therefore, ROA is a good measure in assessing the effectiveness of banks in managing their assets. ROA is calculated

on the division of net profit after deducting interest as well as taxes on the total assets of the company.

Return on Asset (ROA)=(Net Profit (Profit After Interest and Tax))/(Total Assets)×100%

Independent Variable

b. Board Size

The board of directors is evaluated in this study by counting all of its members. The number reflects the supervisory and strategic decision-making structure of the company. A larger board provides a diversity of perspectives, but may hinder coordination. Therefore, board size is considered an important indicator of governance. The information is extracted from the business's annual report (Farooq & Ahmad, 2023).

\sum Member of the Board of Directors

c. Gender Diversity

Gender diversity on the representation of women in business leadership is reflected in the board of directors. The presence of women is believed to increase prudence and the quality of strategic decision-making. Women tend to be more thorough and comprehensive in supervision. A dummy is used to measure this variable: value 1 if there is at least one woman, and 0 if all members are male (Farooq & Ahmad, 2023).

3.3.2 Moderating Variable

a. Intellectual Capital

Intellectual capital in this research acts as a moderating variable that reflects the bank's ability to manage intangible assets to increase profitability. In the banking sector, intellectual capital is important because its business depends on information, customer trust and human resource innovation. Good management is believed to strengthen the influence of board characteristics on bank performance. The measurement uses Pulic's VAIC method, which consists of VACA, VAHU, and STVA. The VAIC calculation is explained based on the formula from Pulic (2000).

$VAIC = VACA + VAHU + STVA$

Value Added Calculation:

$VA = OUT - IN$

Description:

VA = Value Added

OUT = Total Revenue

IN = Expenses Except Salary Expenses + Employee Benefits

Calculation of Value Added Capital Employed:

$VACA = VA / CE$

Description:

VA = Value Added

CE = Equity

Calculation of Value Added Human Capital:

$$VAHU=VA/HC$$

Description:

VA = Value Added

HC = Employee Salary + Wages

Calculation of Structural Capital Value Added:

$$STVA=SC/VA$$

Description:

VA = Value Added

SC = Value Added (VA) - Human Capital (HC)

3.3.3 Control Variable

a. Leverage

Leverage reflects the proportion of a bank's funding that comes from liabilities compared to total assets. As financial institutions, banks are generally financed by deposits and loans, so leverage reflects a reasonable funding structure. However, a high level of leverage may increase liquidity risk. Therefore, leverage is utilized as a control variable in order to examine how the main variables more accurately. Leverage is calculated based on the formula from Farooq & Ahmad (2023).

$$Lev=(Total\ Utang)/(Total\ Aset)$$

4. Results

4.1 Hypothesis Testing (Multiple Linear Regression Analysis)

4.1.1 Determination Coefficient Test

The degree to which the independent variables in the regression model can account for changes in the dependent variable is indicated by the coefficient of determination.

Table 1. Determination Coefficient Test

Determination Coefficient Test				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,515	0,265	0,251	0,634
Independent Variables : Board Size, Gender Diversity, Leverage, Intellectual Capital				
Dependent Variable : Profitability (ROA)				

According to the above table, the variable board size (X1) and gender diversity of directors (X2) can account for roughly 26.5% of the variation in the dependent variable, as indicated by the R Square value of 0.265. Other factors outside the scope of this research model, however, account for the remaining 73.5%. Furthermore, the degree of prediction restrictions in the regression model is explained by the Standard Error of the Estimate (SEE) value, which is around 0.634.

4.1.2 Simultaneous Test (F Test)

Based on the significance value and F count, the F test evaluates the concurrent impact of each independent variable on the dependent variable.

Table 2. Simultaneous Test (F Test)

Simultaneous Test (F Test)		
Model	F	Significance Value
Regression	19,332	0,000
Dependent Variable : Profitability (ROA)		
Independent Variables : Board Size, Gender Diversity, Leverage, Intellectual Capital		

The computed F value, based on the above table, is approximately 19.332 at the maximum scale (p-value) of 0.000. It can be inferred that the regression model utilized is viable for prediction since the significance value is less than the significance level of 0.05. As a result, ROA is impacted by the factors of board size and overall gender diversity of directors.

4.1.3 Partial Test (t Test)

A statistical method for determining how each independent variable affects the dependent variable is the t-test, with the effect considered significant if the significance value <0.05.

Table 3. Partial Test (t-Test)

Partial Test (t-Test)					
Model		Unstandardized Coefficients	t	Significance Value	Results
		B			
1	(Constant)	0,422	1,297	0,196	
	Board Size	0,182	6,346	0,000	H1 Supported
	Gender Diversity	0,184	1,166	0,245	H2 Not Supported
	Leverage	-1,565	-2,012	0,046	
Dependent Variable : Profitability (ROA)					

According to the preceding table, the board size variable has a significance value of 0.000, a computed t value of 6.346, and a regression coefficient of 0.182. It can be inferred that the size of the board of directors has a significant and positive influence on profitability because the significance value is less than the significance level of 0.05. Consequently, this study's first hypothesis is supported.

The board of directors' gender diversity variable has a regression coefficient of about 0.184, a computed t value of about 1.166, and a significance value of about 0.245. It can be inferred that the gender diversity of the board of directors has a minor but favorable impact on profitability because the significant value is higher than the significance level of 0.05. As a result, this study's second hypothesis is unsupported.

4.2 Hypothesis Testing (Moderated Regression Analysis)

4.2.1 Determination Coefficient Test

Table 4. Determination Coefficient Test

Determination Coefficient Test				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,659	0,434	0,413	0,561
Independent Variables : Board Size, Gender Diversity, Intellectual Capital, Board Size*Intellectual Capital, Gender Diversity*Intellectual Capital, Leverage				
Dependent Variable : Profitability (ROA)				

According to this table, the contribution of the board size variable (X1), gender diversity of directors (X2), and intellectual capital as a moderating variable accounts for 43.4% of the variation in the dependent variable, as indicated by the R Square value of 0.434. In the meantime, additional factors not covered by this research model have an impact on the remaining 56.6%. Furthermore, the model's degree of prediction error is indicated by the Standard Error of the Estimate (SEE) value of 0.561; the lower the value, the more accurately the model predicts the dependent variable.

4.2.2 Simultaneous Test (F Test)

Table 5. Simultaneous Test (F Test)

Simultaneous Test (F Test)		
Model	F	Significance Value
Regression	20,210	0,000
Dependent Variable : Profitability (ROA)		
Independent Variables : Board Size, Gender Diversity, Intellectual Capital, Board Size*Intellectual Capital, Gender Diversity*Intellectual Capital, Leverage		

The computed F value, based on the above data, is approximately 20.210 at the maximum scale (p-value) of 0.000. It is possible to conclude that the regression model is practical for use as a prediction tool because the significance value is less than 0.05. Therefore, ROA is impacted by the variables of board size, gender diversity of directors, and interaction with intellectual capital moderation overall.

4.2.3 Partial Test (t Test)

Table 6. Partial Test (t-Test)

Partial Test (t-Test)					Results
Model		Unstandardized Coefficients	t	Significance Value	
		B			
1	(Constant)	0,225	0,700	0,485	
	Board Size	0,079	1,586	0,115	
	Gender	-0,121	-0,578	0,564	
	Intellectual Capital	0,234	3,189	0,002	

	Board Size*Intellectual Capital	0,005	0,222	0,825	H3 Not Supported
	Gender Diverity*Intellectual Capital	0,264	2,105	0,037	H4 Supported
	Leverage	-1,323	- 1,905	0,059	
Variabel Dependen: Profitabilitas (ROA)					

According to the above table, the moderated regression analysis (MRA) results indicate that there is a 0.005 regression coefficient, a computed t value of 0.222, and a significance value of 0.825 for the interaction between the board size variable and profitability. The relationship between board size and profitability is not significantly impacted by intellectual capital, as indicated by the significance value being more than 0.05. Therefore, there is no evidence to support the third hypothesis in this study.

A regression coefficient of 0.264, a computed t value of 2.105, and a significance value of 0.037 indicate that the variable gender diversity of directors and profitability interact, according to the results of the moderated regression analysis (MRA) regression study. Given that the significance value is less than 0.05, it can be said that intellectual capital has a considerable impact on profitability by strengthening the link between gender diversity of directors and profitability. Consequently, this study's fourth hypothesis is validated.

5. Discussion

5.1 The Effect of Board of Directors Size on Profitability

A larger board size can create a stronger and more balanced leadership structure, as it includes diverse perspectives and professional backgrounds that support strategic decision-making. In the context of conventional commercial banks that face high operational complexity and substantial financial risks, diverse board expertise-such as in risk management, audit, finance, and regulation, they are crucial to enhancing the efficiency of planning, accountability, and oversight. A larger board structure is also able to optimize asset utilization, improve operational efficiency, and minimize the dominance of certain individuals in decision-making, thus supporting firm performance as reflected through Return on Assets (ROA).

Theoretically, the connection between the company's manager (agent) and the capital owner (principal) in agency theory often leads to conflicts of interest, especially when management is not aligned with the objectives of the owner of capital. A larger board of directors might help to reinforce the supervisory system and a more structured division of roles, thus supporting objective decisions and safeguarding the interests of capital owners. Findings from Irmawati and Riduwan (2020), Wardati (2020), to Aprila et al. (2022), as well as Riani and Roseliana (2023), demonstrate how having more board members improves

financial performance and profitability, especially when measured using the following indicators

5.2 The Influence of Gender Diversity of Board of Directors on Profitability

Gender diversity on boards is often associated with more inclusive and balanced decision-making. Women are considered to bring a more cautious perspective, especially on social and governance issues, but tend to have a lower risk tolerance than men. This more conservative attitude can influence strategic decisions, especially when facing high-risk opportunities that have a large impact on profitability. Although the presence of women can enrich the dynamics of discussions on the board, this risk-averse approach could be the reason why the effect of gender diversity on Return on Assets (ROA) has not been seen significantly.

From the perspective of agency theory, gender diversity is believed to strengthen the monitoring function and act as a balance in the decision-making process, especially in minimizing management conflicts of interest and capital owners. But the efficiency of women's contributions to the board depends heavily on their active role in strategic discussions and an organizational environment that supports equal participation. If women's participation is still symbolic and not substantive, then its impact on company performance will be limited. Findings from Zulkarnain and Wuri (2019) and Mirawati (2019) support this, by showing that women's cautious nature makes them avoid high-risk decisions, which can hinder companies from pursuing maximum profit potential.

5.3 The Influence of Intellectual Capital in Moderating the Size of the Board of Directors on Profitability

Conceptually, intellectual capital is expected to strengthen the strategic role of the board of directors in terms of oversight and judgment, and formulation of corporate strategies that focus on increasing profitability. Key components such as HR expertise and experience, structured information systems, and the quality of external relations are believed to be the foundation that supports the effectiveness of the board's work. In the context of banking, good intellectual capital management should provide added value in dealing with high business complexity and risk.

However, the study's findings show that intellectual capital has not played an optimal role in strengthening the connection between the company's success and the size of the board of directors. This could be caused by the mismatch between the extensive board structure and the company's intellectual capabilities, which actually creates coordination challenges, opinion dominance, and excessive information burden. Based on Resource-Based Theory (RBT), the only way to get a competitive edge is if resources are managed effectively and strategically. Failure to synergize intellectual capital with the work of the board causes its contribution to performance to be limited. This is in line with the findings of Nawaz Khan and Ali (2018), which state that under certain conditions, intellectual capital can actually

weaken the relationship between board size and Return on Assets (ROA) if it is not supported by an adequate management system.

5.4 The Influence of Intellectual Capital in Moderating Gender Diversity of Directors on Profitability

This finding suggests that diversity in gender on the board of directors structure can have a more optimal impact on profitability if supported by an adequate level of intellectual capital. Intellectual capital enables companies to manage and integrate different perspectives brought by female board members more effectively in the decision-making process. With this support, strategic oversight becomes sharper, and companies are able to respond to business challenges with a more adaptive and innovative approach, thus contributing positively to financial performance.

Theoretically, this result is consistent with the Resource-Based Theory (RBT), which asserts that the ability to comes from a combination of valuable, rare, difficult to imitate, and effectively structured internal resources. Gender diversity and intellectual capital are two strategic assets that, when managed synergistically, can strengthen governance and profitability achievement. Hesniati's (2025) research supports this finding by showing shows the link between gender diversity and profitability is strengthened by intellectual capital, especially if women on the board have an active role and are supported by a work system that encourages real contributions to the company's strategic process.

6. Conclusions

The study's findings support the notion that conventional commercial banks' profitability is positively impacted by the size of their boards of directors. This shows that the more board members there are, the more effective the supervision and strategic decision-making in dealing with the complexity of the banking business. On the other hand, gender diversity on the board has not had a significant effect on profitability, which is likely due to low risk tolerance and the substantive role of women which is still limited when making decisions. Meanwhile, the role of the moderating variable of intellectual capital shows different results. Board size and profitability are not positively correlated with intellectual capital allegedly due to the challenges of coordination in a large board structure. However, the link between profitability and gender diversity can be strengthened via intellectual capital, especially if women on the board play an active role and are supported by an effective work system. This finding emphasizes the importance of intellectual resource management to optimize the board's contribution to improving company performance.

7. Limitation

This study has several limitations that need to be considered:

- a. The study's focus is restricted to traditional general banking firms that are listed on the IDX, therefore the findings cannot be applied to other areas of the banking sector.
- b. In data processing, there are 14 outlier data.
- c. The VAIC technique, which is used to quantify the intellectual capital variable, has limitations in terms of capturing the qualitative elements of intellectual assets.
- d. The model's capacity to explain the dependent variable is still constrained, as evidenced by the coefficient of determination (R^2) value of 0.265.

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