

Analysis of the Influence of Intellectual Capital and Financial Performance on Company Value in Conventional Commercial Banks on the Indonesia Stock Exchange (Period 2014-2023)

Leni Nur Pratiwi¹, Sakina Ichsani², Wahyu Panji Nugrahani³

^{1,2,3}Faculty of Economic and Business, Widyatama University, Bandung, Indonesia,

ABSTRACT:

Purpose – This study aims to analyze and test the influence of intellectual capital on company value through financial performance. The Company's value measurement tools include price-to-book value (PBV), firm performance as measured by return on assets (ROA), and intellectual capital (VAICTM). State-owned banking companies have gone public with the 2014-2023 research period.

Research Methodology – The research method employed in this study is path analysis, which utilizes six variables. The first variable, Intellectual Capital, is measured by the Value-Added Intellectual Capital (VAIC-TM) by the public (2000) and is divided into three variables: value capital employed efficiency (VACA), structural capital value added (STVA), and value human capital efficiency (VAHU). These variables are independent. The next variable is ROA, serving as the Firm's performance Proxy, which acts as the mediator variable. The final variable, the Dependent variable, is PBV, representing the corporate value's Proxy. This study will analyze the influence of each intellectual capital component on PBV, both directly and indirectly through ROA as a mediator variable. The analysis of VAIC on PBV will be conducted both directly and through ROA as a mediator variable, providing a comprehensive understanding of the relationships between the variables.

Findings – Based on the statistical results, this research found that (1) all IC Components have a positive impact on the Company's performance (ROA) (2) VAICTM itself has a positive influence on the Company's performance (ROA); (3) there are no the component of IC and VAICTM has direct impact significantly on Company's value (PBV); (5) while the Company's performance (ROA) positive influences on PBV. Furthermore, (6) company performance (ROA) cannot be an intermediary variable between IC components and Company Value (PBV); on the contrary, it can be an intermediary variable between VAICTM and Company Value (PBV), where VAICTM has an indirect positive impact on company value (PBV).

Novelty: While previous studies have explored the impact of intellectual capital (IC) on financial performance and firm value, this study specifically examines state-owned conventional commercial banks in Indonesia over 10 years (2014-2023). This long-term focus provides a more comprehensive understanding of trends and relationships.

KEYWORDS: Corporate Value, Firm Performance, Intellectual Capital

I. INTRODUCTION

As service-based financial institutions, banks and insurance companies rely more on intangible assets than tangible resources. Elements such as the quality of human resources (human capital), the development of digitalisation systems (structural capital), and strong, trust-based customer relationships (relational capital) are rarely captured adequately in conventional financial statements. Nevertheless, they are pivotal in generating added value and sustaining competitive advantage in the global market. This set of intangible resources is commonly referred to as intellectual capital (IC), which has attracted scholarly attention since Pulic (1999) introduced the Value-Added Intellectual Coefficient (VAIC) model as a method for measuring the efficiency of IC in organisations.

The dominance of intangible assets in global corporate valuations further emphasises the importance of IC. In S&P 500 companies, for example, intangible assets—including patents, brands, and relationships—account for approximately 90% of total market value (Ocean Tomo, 2020). This argument represents about IC, the “hidden value” in traditional financial statements, and is, in fact, a primary force in creating corporate wealth and sustaining global competitiveness.

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Pulić (1998a, 1998b) built a measurement method for measuring the efficiency of intellectual capital by comparing the physical and financial ones, based on the concept of value-added (Lazzolino, Laise, & Migliano, 2014). In measuring company success, Pulic (2000) said that “the corporation should be considered to value creation, value creators, and value creation activities and processes”, and now we call the VAIC™. This method measures intellectual capital that will help the company to maximise their company’s potential based on current business performance, and then it will also be able to optimize the firm’s value in the marketplace. The components of intellectual capital are human capital (HC), structural capital (SC), and relational capital (RC) (Bontis, 2001; Pulic & Bornemann, 1999; Ofurum, Oyintonefie, Fubara, & Azuiké, 2023). Wang, Cai, Liang, Wang, and Xiang (2021) revealed that the efficiency of human, structural, and relational capital contributes to both the speed and quality of innovation, which subsequently enhances financial and operational performance. Madumere and Ubani (2022) examine the effect of Intellectual capital on the financial performance of Deposit Money Banks in Nigeria for the period of 2012-2020, with emphasis on its effect on Value-Added Human Capital, Structural Capital, and Value-Added capital employed on Return on assets

Firm value represents a company’s core objective, which reflects its management effectiveness, adaptability to a dynamic business environment, performance, and stakeholder trust. Intellectual capital (IC) increasingly plays a strategic role in shaping this value. Jaunanda, Hulu, Sembel, and Ugut (2024), who employ the EVAIC⁺ model across Southeast and East Asian manufacturing firms, found that each intellectual capital component positively affects firm value. Similarly, Dewi, BZ, and Yusmita (2025) show that in the Indonesian banking sector, IC has a positive effect on firm value, though other disclosures, such as corporate risk management, may have adverse effects.

Market-based proxies, such as Price-to-Book Value (PBV), are widely used to evaluate how the market perceives a firm’s future growth and performance potential. Recent studies present mixed evidence on the IC–market value relationship. Intara & Suwansin (2024) said that intangible assets significantly enhance Tobin’s Q, indicating that markets reward firms with substantial intellectual capital. Likewise, evidence from European commercial banks shows that human and financial capital efficiencies, as components of VAIC, have a positive and significant association with firm value, underlining the role of intellectual resources in boosting market valuation (Sardo et al., 2024). On the other hand, Jaunanda et al. (2024) find that SCE can negatively and significantly affect PBV and Tobin’s Q, despite positive effects from other IC components. However, Ermawati, Nurcahyono, Sari, and Fakhruddin (2023) found that Intellectual capital has a negative impact on firm value in financial sector companies listed on the Indonesia Stock Exchange for 2017–2021.

Furthermore, the company's financial performance demonstrates its potential for profitability through operational activities and underscores the effective and efficient management of its finances. This stability and efficiency in financial management are key factors in bolstering investor confidence, encouraging long-term investment, and contributing to the company's success. Intellectual capital is an intangible asset owned by a company that influences improving the company's performance, followed by an increase in investor confidence in investing in the company. Some researchers argue that intellectual capital is the hidden value from financial statements that can be a driver for firm performance and become a competitive advantage to face global competition (Corrado, Haskel, Lasinio, and Iommi, 2022; Keter, Cheboi, and Kosgei, 2024). Then, Ali, etc (2022) found that IC efficiency had a positive influence on profitability performance (ROA and ROE) in both companies in Pakistan and India over the ten years (2010-2020).

In this paper, we analyse the influence of intellectual capital on financial performance and firm value, using VAIC™ in the State Public commercial banks in Indonesia. However, this investigation uses the total intellectual capital value and includes the three components of intellectual capital: human capital efficiency (HCE) and capital employed efficiency (CEE). Our data is from the financial reports from 2014 to 2023. Moreover, in this paper, we use financial performance, as measured by ROA, as a mediating variable.

II. LITERATURE REVIEW

a. Intellectual Capital

Roos & Roos (1997) defined Intellectual capital as the sum of the hidden assets of the organization not fully captured on the balance sheet to financial position and thus included both what is in the heads of organizational members, and what is left in the organization when they leave. Intellectual capital is a firm's intangible asset, whether knowledge, information, or experience, owned by human resources and the firm’s organization (Stewart, 1997). The firm's intellectual capital is a collection and synergy of knowledge, experience, invention, innovation, market share, and communities that may affect the firm. According to some researchers, intellectual capital comprises three main components: human capital, structural capital, and customer capital. **Human capital (VAHU)** represents the individual knowledge of an organization, which its employees reflect (Bontis, 2001), which is a combination of genetic inheritance, education, experience, and attitude about life and business. **Capital Employee (VACA)** is

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equally significant, as is the knowledge embedded in marketing channels and, most importantly, customer relationships. **Structural capital (STVA)**, encompassing all non-human knowledge storehouses within the organization, is a key component of the firm's value. This includes databases, organizational charts, process manuals, and strategy routines. The company's efficiency in utilizing structural capital to enhance the capabilities of its employees is demonstrated through investments in facilities and infrastructure, coupled with increased utilization of company information systems by employees. This condition will improve productive employee behavior, increase productivity, and increase the company's value and profitability. It happened because it encouraged many investors to invest in the company, increasing its value in the capital market (Dewi, Gunawan, Firman, Ridwan, & Dambe, 2022). In addition to the traditional triad of human capital, structural capital, and relational capital, recent literature has suggested several nuanced dimensions of intellectual capital relevant to the banking industry, including innovation capital, process capital, and social capital. Innovation capital represents the firm's capacity to develop new products, services, and solutions. In the banking context, this could manifest as fintech innovation, mobile banking features, or AI-based credit risk assessment systems. Process capital reflects the effectiveness and efficiency of internal workflows and standard operating procedures, which are critical for banks in enhancing customer experience and maintaining regulatory compliance. Social capital encompasses the networks and relationships that facilitate knowledge sharing both within and outside the organization, fostering an environment of collaborative learning and value co-creation.

b. Intellectual Value-Added Coefficient (VAIC™)

Pulic and Bornemann (1999) developed the Intellectual Value-Added Coefficient (VAIC™) as a model to quantify intellectual capital (IC) efficiency. This model aims to measure a firm's intellectual capability in generating value added through the effective utilization of physical and financial capital, human capital, and structural capital. VAIC™ reflects the shift in the modern economy from traditional physical assets toward intangible resources such as knowledge, expertise, innovation, and organizational systems. In an increasingly knowledge-based business environment, where intellectual resources often serve as the foundation of competitive advantage, the VAIC™ offers a valuable framework to evaluate how well companies leverage their intellectual assets.

The VAIC™ framework consists of three primary components: Value Added Capital Employed (VACA), Value Added Human Capital (VAHU), and Structural Capital Value Added (STVA). VACA represents the efficiency with which the company utilizes its capital employed (i.e., financial and physical capital) in the value creation process. VAHU captures the value contribution made by human capital, calculated through the value added per unit of personnel costs. STVA, on the other hand, measures the impact of structural capital, which includes organizational infrastructure, processes, databases, patents, and culture, in facilitating human capital productivity. These three components are aggregated to compute the overall VAICTM score, which is considered a proxy for the company's intellectual value creation efficiency (Pulic, 2000).

The Value Added (VA) used in the calculation is a key metric that denotes the wealth generated by the firm within a given period. It is often computed by subtracting operational expenses (excluding labor costs) from the firm's total revenue. The result reflects the tangible outcome of the firm's operational efficiency, and indirectly, the contribution of both intellectual and physical capital. The VAIC™ model assumes that higher value added reflects higher intellectual and operational performance.

Numerous empirical studies have employed the VAIC™ model to analyze the role of intellectual capital in enhancing firm performance. For example, (Abdulsalam, Al-Qaheri, & Al-Khayyat, 2011), applied the VAIC™ model to examine the efficiency of banks in the Gulf Cooperation Council (GCC) region. Their findings revealed a significant and positive relationship between VAIC™ scores and financial performance metrics, including Return on Assets (ROA) and Return on Equity (ROE). These results suggest that intellectual capital, when properly managed and leveraged, can substantially improve financial outcomes. Other studies found that By cross-sector panel analysis Dancaková and Glova (2024) found that the VAIC™ components (HCE, SCE, CEE) as a whole have a significant effect on performance indicators (ROA, ROE, ATO), however the effect of each component varies across countries and sectors — thus confirming the relevance of VAIC™ to explain the role of IC in competitiveness and performances.

In Indonesia, VAIC™ has also been employed in several empirical studies to assess the efficiency of publicly listed companies, particularly in the banking and manufacturing sectors. For example, Ulum (2014) examined the relationship between intellectual capital and firm performance in Indonesian banks and found that higher VAIC™ scores correlated with increased profitability and market valuation. This implies that intellectual capital plays an increasingly strategic role in emerging markets, where intangible assets are becoming critical to overcoming institutional and technological gaps.

Overall, the Intellectual Value-Added Coefficient (VAIC™) remains one of the most practical and widely used frameworks for assessing intellectual capital in both academic research and corporate practice. It provides an objective, data-driven approach to evaluating how well a firm transforms its tangible and intangible assets into value. Although it does not fully account for all qualitative elements of intellectual capital, its simplicity, transparency, and replicability make it a useful benchmark for tracking

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intellectual capital efficiency over time. As organizations continue to navigate the complexities of the knowledge economy, models like VAIC™ offer valuable insights into the intangible drivers of firm success

c. Financial Performance

Financial performance is a critical indicator used to assess how effectively a firm manages its resources to achieve financial objectives such as profitability, liquidity, and solvency. It provides a snapshot of the firm's overall economic condition and helps stakeholders evaluate both short-term operational efficiency and long-term sustainability. According to Susanti, Widajatun, Aji, and Nugraha, (2020), financial performance describes a firm's ability to manage its funds and generate revenues, serving as a central tool for assessing organizational health across a specific time frame. This information becomes essential when making strategic decisions, particularly in volatile economic environments, as it helps identify potential risks and opportunities that can be managed or optimized in the future.

One of the most common dimensions used to assess financial performance is profitability, which measures a company's ability to convert resources into earnings. Among the various profitability indicators, Return on Assets (ROA) stands out as a widely accepted and practical metric. ROA evaluates how efficiently a firm utilizes its total assets to generate net income. It is computed by dividing net income by total assets, offering insights into how much profit is produced per unit of asset employed (Brigham & Houston, 2022). A higher ROA suggests that the company is using its resources effectively to generate earnings, while a lower ROA may indicate inefficiencies in asset utilization or a need for operational restructuring.

The significance of ROA lies in its comprehensive nature, as it includes the contributions of both equity and debt in asset acquisition. Unlike Return on Equity (ROE), which only considers shareholders' equity, ROA offers a broader perspective by assessing returns generated from all capital sources. ROA is particularly useful in comparing firms with varying capital structures, enabling investors and analysts to benchmark performance across industries and markets (Ross, Westerfield, & Jordan, 2021). This makes it an essential tool for evaluating firms in both capital-intensive and asset-light sectors.

Several empirical studies have confirmed the relevance of ROA in measuring financial performance. For example, Almumani (2013) found that in the banking sector, firms with high ROA demonstrated better financial health and investor confidence. Andreeva and Garanina (2017) found a positive relationship between intellectual capital efficiency and ROA, underscoring how intangible resources can drive superior asset performance. Another research (Bhattu-Babajee & Seetanah, 2021) found that VAIC can improve the firm's performance in the long run more than in the short run. Furthermore, ROA has been used as a dependent variable in studies linking intangible resources, such as intellectual capital, to firm outcomes.

In conclusion, financial performance, particularly through the lens of ROA, plays a central role in evaluating how a company transforms its asset base into profit. It enables both internal and external stakeholders to assess management effectiveness, operational health, and overall strategic success. As such, ROA remains a foundational metric for assessing firm performance in both academic research and business practice.

d. Corporate Value

Corporate Value is the firm's value perception of investors and can be connected to the firm's market performance, shown by the change in stock price. The measurement of firm value is the combination of return and risk investment, so that the performance of the market is more comprehensive than that of other performance measures. Firm value is often measured using a combination of return and risk, offering a more comprehensive representation of market performance than traditional accounting-based measures. Among the many metrics used to evaluate corporate value, Price-to-Book Value (PBV) has emerged as a widely accepted tool. PBV compares a firm's market price per share with its book value per share, illustrating how much investors are willing to pay for each unit of net asset value (book value). (Nuryaman, 2015).

PBV is considered a meaningful indicator in capital market analysis because it provides insights into whether a stock is overvalued or undervalued relative to its intrinsic worth. A PBV greater than 1 indicates that the market values the firm higher than its accounting value, which may reflect strong investor confidence, efficient asset use, or the presence of intangible assets such as brand value or intellectual capital. Conversely, a PBV below 1 suggests that the market undervalues the firm, possibly due to poor performance or perceived risks. Sardo and Serrasqueiro (2017) found that intellectual capital significantly and positively affects corporate valuation, as measured by PBV, particularly in knowledge-intensive firms.

In conclusion, corporate value is not only a reflection of financial performance but also the market's assessment of intangible assets and strategic capabilities. PBV offers a valuable perspective in evaluating how intellectual capital translates into shareholder value. As markets continue to evolve, the integration of intangible asset analysis—especially intellectual capital—into firm valuation becomes increasingly critical for investors, managers, and policymakers alike.

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III. RESEARCH METHOD

a) Sample and Research Methodology

The type of research is quantitative with the determination of samples by purposive sampling. Intellectual Capital is the most significant variable measured using added value, corporate value is an independent variable measured by Price to Book Value (PBV), and the moderating variable in this study is financial performance measured by return on asset (ROA), then through use Path analysis to analysis effect between variables in this research. The source was obtained from the IDX from 2014 to 2023. The selected population is banking companies on the IDX, as many as 43 Conventional Commercial Banks, and the number of samples chosen is 4 banks, namely state-owned commercial banks (SOEs). The research variables consist of intellectual capital proposed by Pulić (1998) by determining (VAICTM), namely: 1) Determining the value of VA (added value) with the difference in income minus the burden $VA = OUT - IN$ Where: OUT = Amount of income (sales), IN = Costs in business ventures excluding employee costs; 2) Determine VACA, namely: the result of deduction between the amount of income (sales) and expenses in business ventures excluding employee costs divided by the total amount of assets owned; 3) Determine VAHU, which is the result of the deduction between the amount of income (sales) and expenses in the business excluding employee costs divided by the number of assets to the employee; 4) Determine STVA, which is the result of deduction between the amount of income (sales) and expenses in the business excluding employee costs minus the amount of assets to the employee (honorarium) and divided by the added value. 5) Determine (VAICTM) the total result of all VACA, VAHU, and STVA indicators. Return on Asset (ROA) determines the bank's financial performance. The Formula of ROA is:

$$ROA = \frac{\text{Return}}{\text{Assets}}$$

Company value is determined using the PBV formula as an indicator. The formula of PBV is

$$\text{Price Book Value} = \frac{(\text{closing price} \times \text{Total stock})}{\text{Total Assets}}$$

b) Hypothesis of Research

Model 1 (The component of IC and ROA on PBV)

Value Added Human Capital (VAHU) measures the contribution of human capital in creating added value through the efficiency of personnel costs to the total added value generated by the company. Based on the Resource-Based View (RBV), human resources with high competence, knowledge, and skills are strategic assets that can enhance financial performance. (Jwesim & Mohammed, 2024), revealed a major role for human capital in enhancing the financial performance of Al-Janoob Islamic Bank. Another previous research (Al Momani, Nour, Jamaludin, & Abdullah, 2021), which implies this method in Jordan, and (Sayed & Nefzi, 2024) in Saudi Banks, then (Barak & Sharma, Analyzing the Impact of Intellectual Capital, 2024). However, (Saruultugs, Erdenebat, & Tsetsegmaa, 2022) found that Human capital only has a positive impact on ROE, not on ROA in the commercial banks in Mongolia, similarly (Rehman, Aslam, & Iqbal, 2022) result in 129 Islamic banks in 29 Muslim countries.

Capital Employed Efficiency (VACA/CEE) represents the extent to which the physical and financial capital invested can generate added value. Therefore, VACA is considered one of the key indicators in measuring financial performance, particularly Return on Assets (ROA). Recent international studies have consistently shown the influence of VACA on financial performance. Studies on financial and non-financial firms in Vietnam prove that capital employee has a significant positive effect on firm performance, and indicate that the more efficient the use of capital, the higher the performance in financial firms (Tran & Hong Vo, 2022). Positive impact findings have also emerged in the banking sector in Public Sector and Private sector Banks in India between capital employees (CEE) on Firm performance (Barak & Sharma, Analyzing the Impact of Intellectual Capital, 2024). However, another finding by Barak & Sharma (2024) using GMM, Capital Employee has a negative impact on firm performance in public sector banks in India.

Structural Capital Efficiency (STVA) describes the ability of companies, especially banks, to manage organizational structures, systems, processes, and cultures to support value creation. In contrast to human capital that is inherent in individuals, structural capital is institutionalized in the organization, so that it can increase operational efficiency and generate more stable profits. In the framework of the Resource-Based View (RBV), effective structural capital is a strategic resource that is difficult for competitors to replicate and has the potential to strengthen financial performance, especially Return on Assets (ROA). Positive impact findings have also emerged in the banking sector in Public Sector and Private sector Banks in India between Structural Capital (SCE/STVA) on Firm performance (Barak & Sharma, Analyzing the Impact of Intellectual Capital, 2024), and (Faruq, Akter, & Rahman, 2023) who investigate in Bangladesh.

: There has been a significant impact of the Human Capital (VAHU) on financial performance (ROA)

: There has been a significant impact of the capital employee (VACA) on financial performance (ROA)

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: There has been a significant impact of Structural capital (STVA) on financial performance (ROA)

Human capital efficiency (VAHU) reflects employees' skills, knowledge, and creativity that contribute to value creation. (Bilgin, 2021) emphasized that human capital is a key determinant of firm value because it enhances efficiency and innovation capacity. Empirical evidence from (Dewi, Gunawan, Firman, Ridwan, & Dambe, 2022) also confirmed that human capital positively affects firm value through improved financial performance. In addition, (Intara & Suwansin, 2024) demonstrated that human-oriented intangible assets significantly increase corporate value in knowledge-intensive industries.

Capital employed efficiency (VACA) measures how effectively firms utilize their financial and physical assets to generate added value. (Dewi, BZ, & Yusmita, 2025) found that intellectual capital disclosure, including capital employed efficiency, strengthens firm value in the Indonesian banking sector. Similarly, (Jaunanda, Hulu, Sembel, & Ugut, 2024) showed that efficient utilization of capital resources enhances firm value while minimizing financial distress risk.

Structural capital (STVA) refers to organizational processes, systems, and innovations that support human capital in delivering performance. Empirical evidence highlights its importance in value creation. (Sayed & Nefzi, 2024) found that structural capital significantly contributes to sustainable performance in Saudi banking institutions. In addition, (Dancaková & Glova, 2024) confirmed that structural capital efficiency improves both corporate performance and long-term firm value.

Financial performance, measured by Return on Assets (ROA), is a key determinant of firm value as it reflects profitability and resource utilization efficiency. (Brigham & Houston, 2022) underlined that profitability ratios are strongly associated with firm value, as they influence investor confidence. Supporting this, (Malchev, Atanasovski, & Trpeska, 2024) provided empirical evidence that profitability significantly enhances firm value in emerging banking markets.

: There has been a significant impact of Human Capital (VAHU) on Corporate Value (PBV)

: There has been a significant impact of the capital employee (VACA) on Corporate Value (PBV)

: There has been a significant impact of Structural capital (STVA) on Corporate Value (PBV)

: There has been a significant impact of financial performance (ROA) on Corporate Value (PBV)

The mediating role of financial performance indicates that human capital indirectly influences firm value by enhancing profitability. (Dewi, Gunawan, Firman, Ridwan, & Dambe, 2022) showed that financial performance mediates the effect of intellectual capital, including human capital, on firm value. Likewise, (Faruq, Akter, & Rahman, 2023) confirmed that human capital efficiency contributes to higher profitability, which then strengthens corporate value.

Capital employed efficiency can also indirectly influence firm value via financial performance. Firms that efficiently utilise their financial and physical capital achieve higher profitability, which translates into increased firm value (Dewi, BZ, & Yusmita, 2025). Dewi, BZ, & Yusmita (2025) highlighted that intellectual capital disclosure, including VACA, strengthens market perception and improves profitability. In line with this, it is confirmed that efficient IC strategies enhance firm performance and reduce financial risk, thereby improving firm value.

Structural capital provides an organizational infrastructure that supports innovation, efficiency, and profitability, which can ultimately enhance firm value. (Dewi, Gunawan, Firman, Ridwan, & Dambe, 2022) found that financial performance mediates the effect of IC on corporate value, suggesting that STVA influences firm value through profitability improvements. Similarly, (Dancaková & Glova, 2024) highlighted that structural capital enhances long-term financial outcomes, which translates into better firm valuation.

H8 : There has been a significant impact of the Human Capital (VAHU) component (VAHU, VACA, and STVA) on Corporate Value (PBV) through financial performance (ROA) as a mediator variable

H9 : There has been a significant impact of the capital employee (VACA) on Corporate Value (PBV) through financial performance (ROA) as a mediator variable.

H10 : There has been a significant impact of the Structural capital (STVA) on Corporate Value (PBV) through financial performance (ROA) as a mediator variable

Model 2 (The VAIC™ – IC and ROA on PBV)

In addition to analyzing the individual components of intellectual capital, this study also investigates the aggregate effect of IC, as measured by VAIC™, on financial performance and firm value. Prior research has provided strong evidence that IC efficiency significantly enhances financial performance. Moreover over AbdulRahman and Abubakar (2024); and Rehman, Aslam, and Iqbal (2022) showed that effective utilization of intellectual resources contributes positively to profitability in the banking sector. Moreover, empirical studies by (Ermawati, Nurcahyono, Sari, & Fakhruddin, 2023) and (Keter, Cheboi, & Kosgei, 2024) confirmed that IC directly improves firm value, as markets tend to reward companies that effectively manage and disclose their intellectual resources. Consistent with financial management theory, profitability—as represented by ROA—has been established as a

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fundamental determinant of firm valuation (Ross, Westerfield, & Jordan, 2021), which was also empirically confirmed in banking research by (Malchev, Atanasovski, & Trpeska, 2024). Beyond these direct relationships, intellectual capital is also found to influence corporate value indirectly through financial performance. (Ali, Murtaza, Hedvicakova, Jiang, & Naeem, 2022) and (Saruultugs, Erdenebat, & Tsetsegmaa, 2022) demonstrated that IC improves profitability, which subsequently enhances firm value. Based on these arguments, it is hypothesized that

- H11 : There has been a significant impact of the intellectual capital (IC) on financial performance (ROA)
- H12 : There has been a significant impact of the intellectual capital (IC) on Corporate Value (PBV)
- H13 : There has been a significant impact of the Firm Performance (ROA) on Corporate Value (PBV)
- H14 : There has been a significant impact of intellectual capital (IC) on Corporate Value (PBV) through financial performance (ROA) as a variable mediator

e. Research Model

Based on the theory and previous research as references of hypothesis, the research model of this research is:

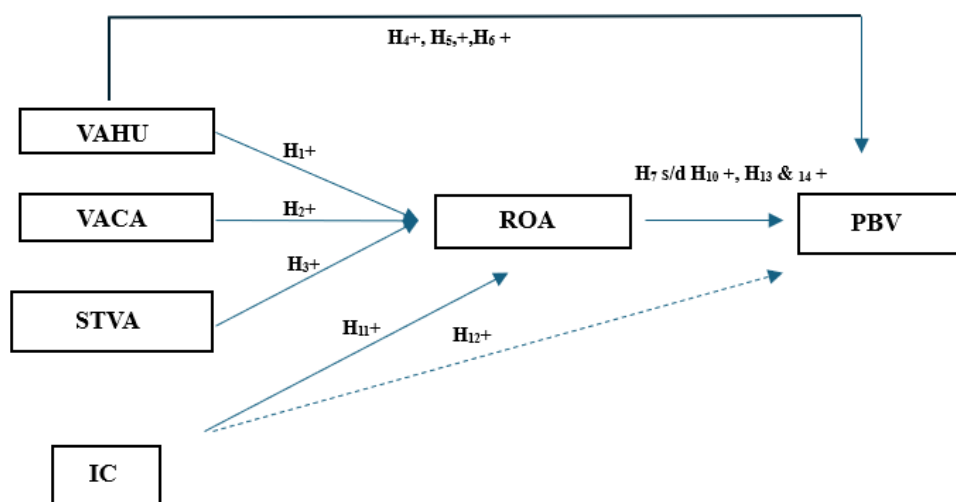


Figure 1 Research Model

2. EMPIRICAL ANALYSIS AND DISCUSSION OF RESULTS

A. EMPIRICAL ANALYSIS

a. The effect of Intellectual Capital's components and Financial Performance (ROA) on Corporate Value (PBV)

1) The Intellectual Capital's Components on Financial Performance (ROA)

Based on the statistical results in Table 1, it shows that the regression coefficient values of capital employed efficiency (VACA) and human capital efficiency (VAHU) to Financial Performance (ROA) with significant levels are 2,68 (0,01) and 18,36 (0,00). Meanwhile, Structural Capital Value Added (STVA) has a coefficient regression at a considerable level of 1,96 (0,059).

Table 1 Statistical Results of IC Components on Firm Performance (ROA)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.010610	0.001325	-8.0081260	0.0000
VAHU	0.001626	0.000606	2.684628	0.0109
VACA	0.502634	0.027376	18.36049	0.0000
STVA	0.009750	0.004984	1.956373	0.0582

Source: EViews, Data process

Those results mean that only two of the variables have a positive impact and are significant on financial performance (ROA); in other words, the increase in VAHU and VACA will increase their performance. Those results show that all hypothesis is **accepted**.

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2) The Intellectual Capital's Components and Financial Performance (ROA) on Corporate Value (PBV)

Following the statistical result from Table 2, VACA and STVA have a significant impact on PBV; however, VACA has a positive impact on Corporate Value (PBV), as shown by the coefficient regression and significant level 2,95 (0,005). Otherwise, STVA has a significantly negative effect on Corporate Value (PBV) with regression test results of - 2,109 (0,04). Furthermore, VAHU has positive and insignificant regression test results of 1,69 (0,098), while ROA has negative and insignificant regression test results of -0,22 (0,83). Those results show that **the fourth hypothesis (H₄) and the seventh hypothesis (H₇) are rejected**; however, **the sixth hypothesis (H₅) and the seventh hypothesis (H₆) are accepted**.

Table 2: Statistical Results of IC's Components and Firm Performance to Firm Value

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.488733	0.486608	1.004366	0.3221
VAHU	0.248054	0.146173	1.696993	0.0986
VACA	57.23336	19.40945	2.948738	0.0057
STVA	-2.434894	1.154457	-2.109126	0.0422
ROA	-7.933029	36.70531	-0.216128	0.8301

Source: EViews, Data process

b. The effect of Intellectual Capital and Financial Performance (ROA) on Corporate Value (PBV)

3) The Effect of Intellectual Capital on Financial Performance (ROA)

Table 3: Statistics Result of VAICTM to Firm Performance (ROA)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001478	0.004004	0.369035	0.7141
IC	0.004892	0.000806	6.070894	0.0000

Source: EViews, Data process

Table 3 reveals that the VAICTM method, as a measure of intellectual capital, exerts a positive influence on financial performance (ROA). This result confirms **the acceptance of the twelfth hypothesis (H₁₂)**, providing a solid foundation for further research and analysis in this area.

4) The Effect of Intellectual Capital and Financial Performance (ROA) on Corporate Value (PBV)

Table 4 shows that ROA positively impacts company value (PBV). Meanwhile, IC (Using VAICTM) has a negative impact and insignificant influence on company value (PBV). In other words, **the ninth hypothesis (H₁₃) was rejected, while the tenth hypothesis (H₁₄) was accepted**.

Table 2 Statistic Result of IC and Firm Performance to Firm Value

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.168791	0.274086	4.264317	0.0001
IC	-0.107699	0.080366	-1.340099	0.1884
ROA	46.33540	11.55412	4.010294	0.0003

Source: EViews, Data process

c. The influence of financial performance as a variable mediator between Intellectual Capital and Firm Value

Using the Sobel test in <https://www.quantpsy.org/sobel/sobel.htm>, this results that:

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Table 3 Sobel Test

Variables	Sobel Test*	Hypothesis Supported
VACA – ROA – PBV	0.2161	NO
VAHU-ROA – PBV	0.2154	NO
STVA - ROA – PBV	0.2148	NO
IC – ROA – PBV	3.3459	YES

t-table = 2,0262

Source: Data Process

Table 5 is the result of the Sobel test, which shows the effect of Intellectual Capital on Corporate Value through ROA as a moderate Variable. Based on table 5 shows that ROA cannot be a moderate variable between the components of intellectual capital (VAHU, VACA, and STVA) on corporate value (PBV), in which the value of the Sobel test is less than the t-table (2,02362), then in other words, **H₈-H₁₁ are not accepted**. However, it can be a moderate variable when **Intellectual capital uses the VAIC™ method to corporate Value (PBV)**, the value of the Sobel test is higher than the T-table, **which** means that **H₁₅ is accepted**.

3. DISCUSSION OF RESULTS

1) The Component of Intellectual Capital and Financial Performance on Corporate Value

The components of Intellectual Capital are Value Human Capital Efficiency (VAHU), Value Capital Employed Efficiency (VACA), and Structural Capital Value Added (STVA). This study found some results. First, **Value human capital efficiency (VAHU)** has contributed to financial performance (Table 1); however, it does not happen to corporate value (Table 2). These results are consistent with previous results, such as Al Momani, et al. (2021) and (Nguyen, 2024), who said that human capital efficiency had a positive impact on firm performance (ROA). (Sayed & Nefzi, 2024) found that human capital is an important component of intellectual capital in Saudi banks, which impacts financial performance. Another research from Ethiopian Banks supports this research, such as Mekonnen (2024), using panel data regression, found that human capital efficiencies had a positive impact on banking performance. In contrast to Rehman et al. (2022)'s result, which found that human capital efficiency negatively affects the performance of IBs. This result shows that when the company gives an intention about human capital quality/activity, it will impact financial performance. However, investors do not consider this value in their investment decision-making, so changes in financial decision policies to improve the quality of human resources do not influence stock price activity.

Secondly, **Value Added Capital Employed (VACA)** is an indicator used to represent how efficiently an entity uses its tangible assets to create added value. VACA illustrates the company's ability to convert its financial resources into tangible outcomes, indicating that VACA is a crucial factor in assessing the company's success. This research found that increasing VACA will increase their financial performance and corporate value (Table 1, Table 2). This result is supported by (Sayed & Nefzi, 2024) which analyzes the influences of intellectual capital on bank performance in the Banking Sector in Saudi Arabia, and also by (Malchev, Atanasovski, & Trpeska, 2024) which applies this method in the Macedonian banking industry. They found that capital employees have a strong positive impact on bank performance, which means that the importance of efficiently managed capital in enhancing profitability. Our result is also consistent with Ozkan & Zeytinoglu (2024) and Buenaño, Báez, and Campaña (2025), who demonstrate that efficient utilization of human and capital employed resources enhances asset quality, thereby reducing credit risk and ultimately improving financial performance. However, Rong, Sial, Álvarez-Otero, AND Jo (2025) stated that IC contributes to corporate value creation in EU banks, but human capital (HC) is less effective than financial capital on financial performance during financial crises. The last variable is the **Structural Capital Value Added (STVA)**, encompassing all non-human knowledge storehouses within the organization, a key component of the firm's value. Increasing STVA shows the improvement in productive employee behaviour as well as productivity. It will impact the company's value and profitability because many investors will be encouraged to invest in the company in the capital market (Dewi et al., 2022). This research found that STVA has a slightly positive and significant impact on firm performance (Table 1) and Corporate Value (Table 2). These findings are supported by Dewi, Gunawan, Firman, Ridwan, and Dambe (2022), who researched intellectual capital, financial performance, and firm value in conventional banks in Indonesia, while Rehman, Aslam, and Iqbal (2022) conducted cross-country research on Islamic banks. They found that SCE has a significant positive impact on company performance and firm value. Therefore, banks are strongly advised to invest more in their hierarchy and structure, particularly in improving innovation and development, thereby increasing bank profitability. Moreover, the Sobel test results show that the relationship cannot mediate firm performance between each component of intellectual capital and corporate value (Table 5). This result shows that each intellectual capital does not impact corporate value indirectly, so VAHU does not influence PBV either directly or indirectly, whereas indicate that the relationship between each component of intellectual capital

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and corporate value cannot be mediated by firm performance VACA and STVA have no indirect effect on PBV when ROA becomes a mediating variable

2) The Intellectual Capital (VAICTM) and Financial Performance on Corporate Value

Banking is a service company whose most operational activities are related to intangible assets such as employee quality, quality of software/system, and customer relationships that impact their performance. From the statistical results, we found that intellectual capital positively impacts the firm's performance (Table 1), meaning that effectively and efficiently managing intellectual capital is important. It impacts increasing financial performance, which indicates the company's financial health. This result was supported by previous research by Nuryaman (2015), Ali et al. (2022), and Abdul Rahman et al. (2024). Abdul Rahman and Abubakar (2024), on the oil and gas sector, which has distinct structural and capital intensity differences, also highlight that human and customer capital significantly affect profitability. These parallels underscore the universal significance of intellectual capital across sectors and regions, while also drawing attention to contextual peculiarities such as regulatory environments, investor behaviour, and cultural factors influencing human capital development and utilization. However, this research found that intellectual capital does not impact corporate value, which is the proxy PBV (Table 2), meaning that investors do not consider operational activities' quality when making investment decisions. This result, supported by Bilgin (2021), found that the efficient management of intellectual capital increases the profitability of sample firms, but there is no significant relationship with market value. It means that even though intellectual capital management has increased, this is not meaningful for investors and therefore does not affect market value.

4. CONCLUSION

A bank is a service company whose operational activity depends on the quality of intangible assets, such as employees, software, and consumer relationship efficiencies. This research examines intellectual capital and firm performance on corporate value in 4 state-owned conventional commercial banks (BUMN) in Indonesia and uses data for 10 years (2014-2023). This research uses proxies for each VAICTM component for intellectual capital, ROA for firm performance, and PBV for Corporate Value. From this research, we can draw two conclusions: first, the relationship between the components of intellectual capital and firm performance on corporate value, and second, the relationship between Intellectual Capital (VAICTM) and firm performance on corporate value.

The first part, based on statistical tests, found that each component of Intellectual Capital (VAICTM) has a positive and significant impact on firm performance (ROA). It means that increasing human capital (VAHU), customer capital (VACA), and structural capital (STVA) efficiency increases firm performance (ROA), even though only VACA and STVA have a positive impact on corporate value (PBV). As professionals in the field, we believe that intellectual capital plays a crucial role in applying these findings. The more efficient the use of funds to improve the quality of each component of intellectual capital, the more it increases the company's profits because it is related to customer service. The better the customer service provision, the more they will entrust their financial activities to the bank, increasing the company's income. However, only two components, VACA and STVA, directly positively impact firm value (PBV), while VAHU and ROA do not significantly impact PBV. However, three of intellectual capital do not indirectly significantly impact PBV when ROA becomes a mediator variable.

In the second part, based on statistical tests, this research found that Intellectual capital (VAICTM) has a positive impact on firm performance (ROA) but has no direct significant implications for corporate value (PBV). However, when RoA becomes the mediator variable, VAICTM has a significantly positive impact on PBV. This result underscores the crucial role of using all intellectual capital efficiently, as it improves profitability (ROA) and enhances the overall corporate value. It is a call to action for companies to optimize their use of intellectual capital. However, the VAICTM has no significant direct impact on PBV but has an indirect positive effect on PBV when ROA becomes a moderating variable. This result shows that investors will consider a combination of intellectual capital (VAICTM) when it impacts profitability.

Furthermore, from this study, we have some suggestions on some points. From a managerial standpoint, this study emphasizes the need for banking executives to view intellectual capital not merely as an abstract concept but as a tangible strategic resource. Proactive investments in training programs, leadership development, employee well-being, and digital upskilling are imperative to maximize human capital efficiency. Likewise, cultivating robust information systems, knowledge repositories, and standardized processes can bolster structural capital, leading to smoother service delivery and improved compliance. Finally, in a highly customer-centric industry like banking, relationship management tools, customer feedback systems, and stakeholder engagement strategies are pivotal in enhancing relational capital, thereby fostering loyalty and long-term value creation. Moreover, integrating intellectual capital considerations into performance measurement frameworks and incentive systems can motivate employees to align their contributions with long-term value drivers. For instance, key performance indicators (KPIs) that reward knowledge

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sharing, customer satisfaction, and innovation can reinforce a culture that values intellectual contributions. Integrating intellectual capital considerations into performance measurement frameworks and incentive systems can motivate employees to align their contributions with long-term value drivers. For instance, key performance indicators (KPIs) that reward knowledge sharing, customer satisfaction, and innovation can reinforce a culture that values intellectual contributions.

At the policy level, regulators and policymakers should recognize the strategic importance of intellectual capital in the financial services industry. Measures such as tax incentives for training and R&D, mandatory disclosures of intellectual capital components in annual reports, and national frameworks for digital literacy can enhance sectoral competitiveness. The Indonesian Financial Services Authority (OJK) can play a proactive role by issuing guidelines that standardize intellectual capital reporting among banks listed on the Indonesia Stock Exchange (IDX), thereby improving transparency and investor decision-making.

Additionally, academic-industry collaboration should be promoted to bridge the gap between theoretical insights and practical implementation. Establishing research grants and incubation centres within universities can help develop context-specific intellectual capital management tools suited for local banking challenges.

While this study offers important insights, there remain multiple avenues for further exploration. Future research could expand the sample to include private banks and Islamic banks, enabling broader generalization. Moreover, incorporating qualitative methods such as interviews or case studies would allow deeper exploration of how intellectual capital practices are embedded within organizational culture and leadership strategies.

It would also be valuable to examine the moderating role of digital transformation or ESG (Environmental, Social, and Governance) initiatives on the relationship between intellectual capital and firm performance. As digitalization becomes increasingly central to banking operations, understanding how digital capital interacts with human, structural, and relational capital may uncover new pathways for sustainable growth.

Lastly, longitudinal studies beyond the 2014-2023 scope can assess how intellectual capital evolves across economic cycles, regulatory changes, or technological disruptions, thereby offering more dynamic insights into the capital market and banking landscape.

The additional analysis enriches the understanding of intellectual capital's role in shaping firm performance and market valuation within the Indonesian banking context. By adopting a strategic approach to developing intellectual capital, supported by sound managerial practices and regulatory frameworks, banks can enhance their competitiveness, profitability, and market perception, paving the way for sustainable value creation in an increasingly knowledge-driven economy.

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