The Moderating Effect of Competitive Advantage on the Relationship of Intellectual Capital and Financial Performance

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ABSTRACT

This study examines the effect of intellectual capital components: human capital, structural capital, and physical capital on financial performance, while assessing the moderating role of competitive advantage. The population consists of banking companies listed on the Indonesia Stock Exchange and Commercial Bank of Malaysia from 2020-2023. A total of 264 observations were selected using purposive sampling based on predefined criteria. Panel data regression analysis using Stata software shows that human capital and physical capital have a positive and significant effect on ROA, while structural capital and competitive advantage do not. Moreover, competitive advantage significantly moderates the relationship between physical capital and ROA.

Keywords: Intellectual Capital Components; Competitive Advantage; Financial Performance.

Pengaruh Moderasi Keunggulan Bersaing terhadap Hubungan antara Modal Intelektual dan Kinerja Keuangan

ABSTRACT

Penelitian ini bertujuan untuk menguji pengaruh komponen intellectual capital: human capital, structural capital, dan physical capital terhadap financial performance, dengan competitive advantage sebagai moderasi. Populasi penelitian ini adalah perusahaan sektor perbankan yang tercatat di Bursa Efek Indonesia dan Bank Komersial Malaysia selama periode 2020-2023. Sebanyak 264 data amatan memenuhi kriteria yang dipilih dengan purposive sampling. Hasil penelitian regresi data panel dengan software Stata menunjukkan bahwa, human capital dan physicasl capital berpengaruh positif dan signifikan terhadap ROA, sedangkan structural capital dan competitive advantage tidak berpengaruh signifikan. Competitive advantage terbukti memoderasi secara signifikan hubungan antara physical capital dan ROA.

Kata Kunci: Intellectual Capital Components; Competitive Advantage; Financial Performance.

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INTRODUCTION

Business expansion is the cornerstone of modern economies and is a key indicator of the degree of societal prosperity. In this context, the process of globalization has contributed significantly to the pursuit of competitive advantage, enabling organizations to develop sustainably in the various regions in which they operate (Perło & Arszułowicz, 2022). Organizational performance and sustainability depend on strategic alignment and efficient resource allocation (Bucur, 2023). According to RBV theory, intellectual capital is crucial for gaining a competitive advantage in a knowledge-based economy by utilizing and developing corporate resource (Rachmah et al., 2023).

The IMD World Competitiveness Center has played an important role in providing an objective assessment of country competitiveness through its annual publication. Strategic recommendations for policymakers, companies, and scholars are provided by the report, which assesses the infrastructure, business efficiency, government efficiency, and economic performance of several nations, including Indonesia and Malaysia (IMD, 2024). Awwad & Qtaishat (2023) in their research found a positive correlation between increasing competitiveness through the utilization of intangible assets, including intellectual capital by strengthening competitive advantages in the banking sector. In 2024, the International Institute for Management Development (IMD) issued a report on the ranking of competitive countries in Asia, which is shown in the following graph.

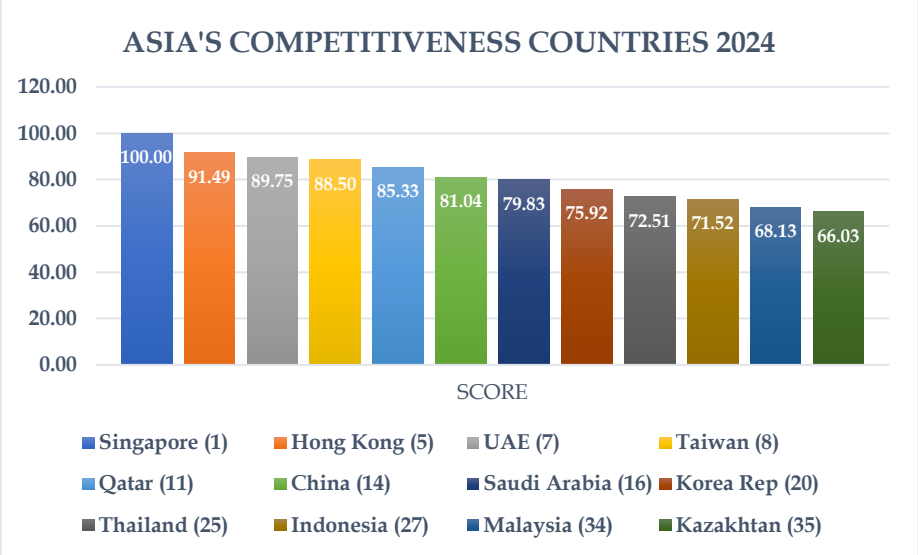

Figure 1. Research Phenomenom

Source: International Institute for Management Development (IMD), 2024

The IMD World Competitiveness Ranking 2024 revealed a disparity in competitiveness performance in the Southeast Asian region, where Singapore managed to maintain the top position (100.00), while Indonesia (27th, score 71.52) and Malaysia (34th, score 68.13) are still lagging behind despite various reforms and strategic initiatives. Indonesia recorded its best achievements thanks to the acceleration of digital transformation, infrastructure development, and improved regulations (BKPM, 2024). Meanwhile, Malaysia rely on green economy development and financial innovation as growth drivers (The Edge Malaysia,

2024). However, this lagging competitiveness position reflects the need to improve financial performance, especially in strategic sectors such as banking, which is the backbone of the national econom (Hayuningtyas et al., 2024).

Kamukama et al. (2017) and Xu & Li (2022), explained that to drive the performance improvement, the two main factors that need to be considered are intellectual capital and competitive advantage which are proven to contribute to profitability and business sustainability. Therefore, strengthening intellectual capital and creating competitive advantage are important strategies in driving bank efficiency and profitability, especially in Indonesia and Malaysia, to improve global competitiveness position in a sustainable manner. Several research have explored the elements affecting the financial performance of enterprises on IC (Asare et al., 2020; Cenciarelli et al., 2018; García Castro et al., 2021; Habibah & Riharjo, 2016; Majumder et al., 2023; Nadeem et al., 2017; Ul Rehman et al., 2023; Xu & Liu, 2021) and CA (Kamukama et al., 2017) and (Pratama et al., 2024).

Intellectual capital is the first factor that means intangible asset utilized to produce value, develop high performance, and realize the company's goals (AlQershi et al., 2023). Ul Rehman et al. (2023), stated that banks operate under rapidly changing economic and technological conditions by strategically using intellectual capital, which includes human capital, structural capital, and physical capital, to overcome institutional gaps in the face of external competitive pressures, improve financial performance, and gain a competitive advantage. Banks that manage intellectual capital effectively tend to have better financial stability and adaptability to market changes (Rochmadhona et al., 2018). Research conduct by Nadeem et al. (2017); Ur Rehman et al. (2022); and Xu & Liu (2021) intellectual capital is a strong strategic asset that influences financial performance and long-term competitive advantage development. As opposed to, Dalwai et al. (2022) and Weqar et al. (2021) suggest that intellectual capital is not a significant driving variable for financial performance. With this research gap, this research still needs to be re-examined.

The second factor is competitive advantage. As a moderating variable, competitive advantage is crucial in assessing a nation's competitiveness. Research by Pratama et al. (2024) states that the competitive advantage owned by the company is a strategy that can be done to make a company superior. Malaysia tends to have a competitive advantage in banking product diversification and more stable financial policies than Indonesia (IMF, 2024). Meanwhile, Indonesia, as a larger market, has a high growth potential but faces challenges in terms of efficiency and faster adoption of financial technology (OJK, 2024). Hapsari (2018), states that competitive advantage is very important to differentiate the position between one bank and another. Compared to other countries in the chart, the competitive advantage of Indonesia and Malaysia is still in the developing stage compared to more advanced countries in finance such as Singapore and Hong Kong. Porter (1985) revealed that competitive advantage is the essence of a company's performance in a competitive market environment in implementing the right strategy to obtain economic benefits that exceed competitors in the same industry. Competitive advantage is a key mediator in the relationship between intellectual capital and financial performance, increasing it by 22.4% in financial institutions, according to earlier research by (Kamukama et al., 2011).

Previous study by Ul Rehman et al. (2023) examined the relationship between financial performance and intellectual capital in the banking industry listed on the exchanges of the eight largest ASEAN economies between 2017 and 2021. This study expanded on that work. The focus of this study was banking firms that were listed between 2020 and 2023 on the Indonesian stock exchanges and Commercial Bank of Malaysia. The financial industry was chosen because it is a major component in supporting competition to improve a country's economy. Based on data from the Asia's Competitiveness Ranking 2024 phenomenon, this study has been updated to describe a more comprehensive relationship between intellectual capital and financial performance by adding competitive advantage as a moderating variable. This will provide businesses with a comprehensive understanding of how competitive advantage increases the interaction between intellectual capital and financial performance and supports the creation of a higher competitive ranking in an era of fast globalization.

The RBV theory developed by Barney (1991) and Wernerfelt (1984) asserts that financial performance can be achieved by managing internal resources that are valuable, rare, not easily imitated, and irreplaceable. Intellectual capital particularly human capital is recognized as a strategic resource under this framework due to its critical role in enhancing organizational capabilities, driving operational efficiency, and improving financial performance over time (Hafidhah et al., 2022; Panno, 2020). Human capital as the main component of intellectual capital reflects the quality of human resources in the organization, including knowledge, skills, experience, and competencies possessed by employees play an important role in increasing productivity, operational efficiency, and achieving financial performance, especially in the banking sector (Nadeem et al., 2017). A well-executed resource based strategy that leverages human capital is difficult for competitors to replicate, thereby amplifying the effect of human capital on financial performance (Makadok, 2001). The high quality of human resources in the banking industry is able to encourage innovation and increase efficiency in strategic decision making and contribute significantly to improving financial performance (Majumder et al., 2023). The banking industry, particularly in Indonesia and Malaysia, depends on the competence and capability of human resources to handle competitive dynamics and market changes. According to research by Hafidhah et al. (2022), investing in human capital is essential to achieving sustainable financial performance improvement in these countries. Thus, it is hypothesized that human capital significantly improves banking financial performance in Malaysia and Indonesia, particularly as measured by Return on Assets (ROA).

Research by Le et al. (2022) concluded that human capital has a positive influence on financial performance, the same results were found by A & V (2020) and Xu & Liu (2021), which explained that the utilization of intangible resources, especially human capital, can significantly affect financial performance in banking sector companies. So that the first hypothesis states that:

H_1: Human capital has a significant positive effect on Financial Performance.

Efficient management and utilization of intangible assets such as structural capital described in RBV theory is essential to improve financial performance in the banking sector (Barney, 1991). Structural capital, which includes systems,

programs, and research and development, plays a key role in optimizing company processes and eventually influences financial performance (Soetanto & Liem, 2019). Banks in ASEAN countries recognize the role that structural capital efficiency plays in creating value, which is closely related to financial performance indicators (Ul Rehman et al., 2023). Given the important role of structural capital in improving financial performance, particularly ROA, this study proposes that higher structural capital results in better financial outcomes for banks in Indonesia and Malaysia.

Research by Ali et al. (2021) concluded that structural capital has a positive influence on financial performance. Acuña-Opazo & González (2021) and Ur Rehman et al. (2022) conclude that investing in structural capital to asses internal processes and value creation can significantly improve financial performance. So the second hypothesis states that:

H_2: Structural capital has a significant positive effect on Financial Performance.

Physical capital refers to the efficiency with which physical and financial capital are used to create added value for a company, particularly in the banking sector, where tangible assets such as branches, equipment, and technological infrastructure are critical to a bank's ability to deliver services and generate revenue (Ul Rehman et al., 2023). RBV theory supports the view that firms must effectively use their internal resources, including physical capital, in order to achieve long-term financial success (Barney, 1991). Efficient management and utilization of physical capital contribute to capital efficiency, an important component of the VAIC model (Pulic, 2004). Sharabati et al. (2010) explain that banks with efficient physical capital including modern infrastructure and strategically located branches can serve customers and process transactions effectively and lead to high revenue generation compared to capital employed, this will increase capital employed. Therefore, investment in physical capital can increase the effectiveness of physical capital initiatives and, consequently, improve financial results.

Research by Asutay & Ubaidillah (2024) concluded that physical capital has a positive influence on financial performance. Similar findings were discovered by Dalwai et al. (2022) and Xu et al. (2023) which show that the banking industry that invests and manages physical capital strategically tends to achieve better financial performance. So the third hypothesis states that:

H_3: Physical capital has a significant positive effect on Financial Performance.

In regard to the RBV theory, a company's capacity to attain exceptional financial performance is contingent upon the strategic use of rare, valuable, unique, and irreplaceable resources (Barney, 1991). In the context of banking, competitive advantage comes from the effective utilization of intangible assets such as intellectual capital, which includes human capital, structural capital, and physical capital (Ul Rehman et al., 2023). Efficient intellectual capital management enables banks to develop innovative financial products, foster strong customer relationships, and adapt to dynamic market conditions (Asutay & Ubaidillah, 2024; Le et al., 2022; Xu & Liu, 2021). The ability to transform knowledge and capabilities into superior value for customers ultimately results in improved financial performance, such as increased profitability, improved ROA and equity, and greater market share (Ul Rehman et al., 2023).

Research by Ahamad et al. (2023) concluded that competitive advantage has a significant positive effect on financial performance where banks that invest strategically and manage their intellectual capital resources tend to outperform other banks. The same results were found by Dalwai et al., (2022) and Xu et al. (2023) which show that banks with strong competitive advantages are in a better position to attract and retain customers, manage risk, and innovate in response to changes in market demand. So the fourth hypothesis states that:

H_4: Competitive advantage has a significant positive effect on Financial Performance.

A company's competitive edge, according to the RBV theory, rests on its capacity to manage and make use of internal resources that are rare, valuable, unique, and irreplaceable in order to attain superior financial performance (Barney, 1991). Human Capital Efficiency as the main component of intellectual capital reflects the ability of employees to generate value through their skills, knowledge, and competence (Ul Rehman et al., 2023). Research by Ahamad et al. (2023) and Dalwai et al. (2022) show that the direct effect of human capital on financial performance is often influenced by external factors such as competitive advantage. By offering a strategic framework for maximizing the use of human resources, competitive advantage serves as a moderating element that enhances the correlation between financial success and human capital (Le et al., 2022). The same results were found by Asutay & Ubaidillah (2024) and Xu et al. (2023) which showed that banks with strong competitive advantage are able to utilize their human capital with the demands of the market and industry dynamics thus increasing operational efficiency, product innovation, and profitability. Competitive advantage acts as a catalyst that allows human capital to function optimally in driving the achievement of sustainable financial performance, especially in the Indonesian and Malaysian banking sectors (Nadeem et al., 2017). This shows that competitive advantage strengthens the positive impact of human capital on financial performance by facilitating resource alignment and innovation (Xu & Liu, 2021). So the fifth hypothesis states that:

H_5: Competitive advantage moderates the positive relationship of Human capital on Financial Performance.

Structural capital as part of intellectual capital reflects systems, processes, and organizational structures that support value creation and operational efficiency of the company (Ul Rehman et al., 2023). Research by Asutay & Ubaidillah (2024) and Xu et al. (2023) state that competitive advantage strengthens the relationship between structural capital and financial performance when companies utilize their infrastructure optimally, encourage innovation, efficiency, and adaptation to market changes. In the dynamic capability perspective by Teece et al. (1999), competitive advantage acts as an adaptive mechanism that allows companies to align and develop competitive advantage in the face of environmental dynamics to encourage the achievement of sustainable financial performance. This is consistent with Ousama et al. (2020), who demonstrate that structural capital represents the organization's ability to leverage databases and infrastructure to promote productivity, creativity, and diverse knowledge in the context of competitive advantage and financial longevity. In this context, competitive advantage acts as a dynamic capability that allows companies to continuously

improve structural capital and align it with market opportunities, thus strengthening its relationship with financial performance. So the sixth hypothesis states that:

H_6: Competitive advantage moderates the positive relationship between Structural capital on Financial Performance.

Physical capital in the banking industry, such as branch networks and technology infrastructure, is clearly a valuable asset for banks, however, how much of an impact it has on financial performance depends on how well the competitive advantage is owned and used (Ul Rehman et al., 2023). Banks with strong competitive advantage built on intellectual capital with physical capital as one of its components and efficient operations can utilize their physical capital investment more effectively than competitors (Asutay & Ubaidillah, 2024). In other words, competitive advantage can act as a catalyst, which strengthens the positive relationship between physical capital and financial performance. In a changing environment, a bank's capacity to adjust, reorganize, and integrate its resources is essential to maintaining a competitive edge. (Teece et al., 1999).

According to research by Le et al. (2022) and Sirmon et al. (2011) competitive advantage acts as a catalyst, strengthening the effect of physical capital on financial performance, and banks with a strong competitive advantage can effectively use physical capital investment to improve financial performance. So the seventh hypothesis states that:

H_7: Competitive advantage moderates the positive relationship between Physical capital on Financial Performance.

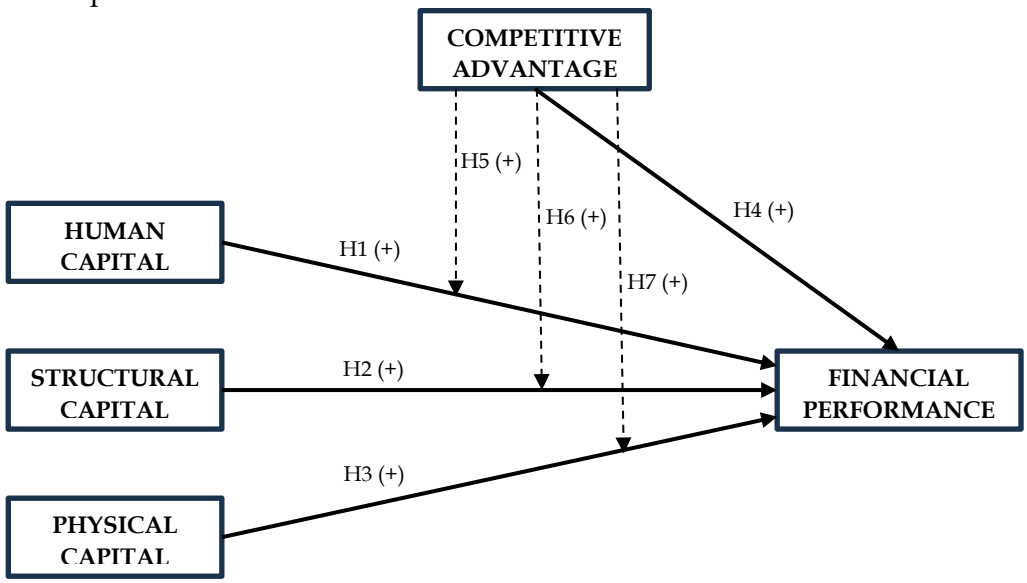

Figure 2. Research Model

Source: Research Data, 2025

RESEARCH METHODS

Table 1. Research Criteria

Research Criteria
• Indonesian banking sector companies listed on the IDX and Malaysian banking sector companies listed on the Commercial Bank of Bank Negara Malaysia (BNM) during the period 2020–2023.
• Reporting financial statements or annual reports for the period 2020–2023.

Source: Research Data, 2025

The study's secondary data were obtained from financial statements and annual reports of companies that were fully published on the Indonesia Stock Exchange, the Commercial Bank of Malaysia, and the official websites of related companies between 2020 and 2023. Sample selection using purposive sampling method, according to Nyimbili & Nyimbili (2024), The majority of research publications use purposive sampling, a deliberate sampling technique that can be applied to any study paradigm and helps guarantee the discovery of high-quality samples free from bias, increasing the findings' dependability and confidence. According to the criteria outlined in Table 1, researchers examined 66 companies with 264 samples, including banking sector companies listed on the Indonesia Stock Exchange, Malaysian Commercial Banks, and the official websites of related companies for the 2020–2023 period that have released and have annual or financial reports.

A panel data regression model is utilized in this study to investigate the effect of independent and moderating variables on dependent variables. Furthermore, the Hausman Test is used to select the optimal model between Random Effect (RE) and Fixed Effect (FE) (Gujarati & Porter (2009).

This study uses Model (1) to test the effect of HCE, SCE, and CEE on ROA. While Model (2) is used to test the moderating effect of AUC on the relationship between HCE, SCE, CEE on ROA. The following is the regression equation model used in this study:

(1) $ROA = a + \beta1HCE + \beta2SCE + \beta3CEE + \beta4AUC + \beta5SIZE + \beta6Lev + e$ .....(1)

(2) $ROA = a + \beta1HCE + \beta2SCE + \beta3CEE + \beta4AUC + \beta5HCE*AUC + \beta6SCE*AUC + \beta7CEE*AUC + \beta8Lev + \beta9SIZE + e$ .....(2)

Description:

ROA	= Return on Asset
a	= Constant
β1 – β9	= Regression coefficient in each variable
HCE	= Human Capital Efficiency
SCE	= Structural Capital Efficiency
CEE	= Capital Employed Efficiency
Lev	= Leverage
SIZE	= Company Size
AUC	= Asset Utilization Capability
e	= Error term

Tabel 2. Operational Definition

Variables	Operational Definition of Variables	Variable Measurement
Financial Performance (Y)	Financial Performance describes the state of the firm's finances over a specific time period and the outcome of management's use of corporate resources, profitability and efficiency indicators are frequently used to evaluate Financial Performance. (Rusmawan et al., 2023)	$\text{ROA} = \frac{\text{Net Income}}{\text{Total Assets}}$ X 100% (Xu et al., 2023)
Intellectual Capital (X)	Intellectual Capital is an intangible asset that is used to create value, achieve high performance, and realize the goals of the company. (AlQershi et al., 2023)	VAIC = HCE + SCE + CEE (Pulic, 2004)
Human Capital (X1)	Human Capital is measured using Human Capital Efficiency (HCE) which means the ratio between the company's Value Added (VA) to the cost of human capital, such as salaries, training, and benefits (Ousama et al., 2020)	$\text{HCE} = \frac{\text{VA}}{\text{HC}}$ (Pulic, 2004)
Structural Capital (X2)	Structural Capital is measured using the Structural Capital Efficiency (SCE) proxy which is used to measure how effective a company, especially bank, leveraging organizational systems, information technology, and internal processes to support value creation. (Ur Rehman et al., 2022)	$\text{SCE} = \frac{\text{SC}}{\text{VA}}$ (Pulic, 2004)
Physical Capital (X3)	Physical Capital proxied by Capital Employed Efficiency (CEE) measures the efficiency of physical and financial capital utilization in creating added value. (Ul Rehman et al., 2023)	$\text{CEE} = \frac{\text{VA}}{\text{CE}}$ (Pulic, 2004)
Competitive Advantage (Z)	Competitive Advantage measured using Asset Utilization Capability (AUC), which is the company's effectiveness in utilizing assets to compete and generate profits. (Hapsari, 2018)	$\text{AUC} = \frac{\text{Total Revenue}}{\text{Total Assets}}$ X 100% (Hapsari, 2018) dan (Smith & Meso, 2000)

Source: Research Data, 2025

RESULT AND DISCUSSION

This analysis is used to describe the data collected with the aim of providing an overview of the main value distribution and potential heterogeneity between companies in the research sample.

Table 3. Descriptive Stastistical Analysis Test Result

Variable	Mean	Std. Deviation	Minimum	Maximum
ROA	0.007	0.022	-0.180	0.840
HCE	2.512	2.674	-10.606	19.099
SCE	0.534	1.608	-17.214	16.040
CEE	0.194	0.188	-1.087	1.197
AUC	0.065	0.057	0.000	60.554
SIZE	29.562	3.223	23.021	35.315
Lev	5.827	3.741	-1.000	20.092
Observation	264			

Source: Research Data, 2025

The descriptive statistical results of the panel data of 264 sample companies for the period 2020 - 2023 show an average profitability of 0.007 or 0.70%, which means that the financial performance of the sample companies is relatively low. This value is below the standard of good banking (> 1.5%) according to Bank Indonesia Regulation No.13/1/PBI/2011, so this can indicate that the health condition of a bank is not good. Kamath (2007) conducted a general study by classifying VAIC scores based on four performance categories, namely top performer (>5), good performer (4 - 5), common performer (2.5 - 4), and bad performer (<2.5). Overall, the average VAIC for the sample data studied has a value of 3.241. This indicates that VAIC in Indonesian and Malaysian banking sector companies is included in the category of good performers or common performers. Therefore, in general, Indonesian and Malaysian banks are quite effective in utilizing the resources of intellectual capital.

After descriptive analysis, the Hausman Test is used to determine which of the Fixed Effect Model or the Random Effect Model is more appropriate.

Table 4. Hausman Test

Hausman Test	Chi2	Prob > Chi2	Result
Model 1	73.90	0.000	FE
Model 2	89.55	0.000	FE

Source: Research Data, 2025

Wooldridge (2002), explains that the Hausman test is used to compare FE and RE estimators in panel data regression models. Table 4 shows the Hausman test results for Models 1 and 2. The fixed-effects model (FEM) provides the best fit for this study, with a chi-squared probability value (Prob > Chi2) of 0.000 < 0.05.

Furthermore, the classical assumption test is conducted to ensure that the data is normally distributed, especially the assumptions about the absence of variance equality (homoscedasticity) and autocorrelation in errors (Gujarati & Porter, 2009; King et al., 2017).

Table 5, shows the presence of Heteroscedasticity because the P-value (Prop> Chi2) is below the sign level (0.05) in model 1 and model 2 which is indicated by a P-value of 0.000 < 0.05. Furthermore, if the P value (Prob > F) is below the sign level (0.05), then this indicates the presence of Serial Correlation. Table 5, shows that there is significant Serial Correlation with a P-value (Prob> F) in model 1 and model 2 that is 0.000 < 0.05.

Table 5. Heteroscedasticity Test and Serial Correlation Test

Model 1		Model 2	
Full Sample	264	Full Sample	264
Heteroscedasticity		Heteroscedasticity	
Chi2	36507.87	Chi2	16427.72
Prob > Chi2	0.000	Prob > Chi2	0.000
Serial Correlation		Serial Correlation	
F	13.096	F	19.218
Prob > F	0.000	Prob > F	0.000

Source: Research Data, 2025

The results of the hypothesis tests of Model 1 are shown in Table 6 and the regression model equation obtained in this study is shown below:

Table 6. Hypothesis Test Model 1

Hypothesis	Path	Coefficient	T value	P>|t|	Result
H1	HC ⇒ FP	0.004	2.25	0.028**	Accepted
H2	SC ⇒ FP	-0.000	-0.21	0.831	Rejected
H3	PC ⇒ FP	0.080	3.75	0.000***	Accepted
H4	CA ⇒ FP	0.061	1.10	0.274	Rejected
R-Squared		0.689			
F		18.26			
Prob>F		0.000			
*10% Sign					
**5% Sign					
***1% Sign					

Source: Research Data, 2025

The results of the hypothesis tests of Model 2 are shown in Table 7 and the regression model equation obtained in this study is shown below:

Table 7. Hypothesis Test Model 2

Hypothesis	Path	Coefficient	T value	P>|t|	Result
H5	HC*CA⇒ FP	-0.011	-2.02	0.047**	Rejected
H6	SC*CA⇒ FP	0.022	0.71	0.481	Rejected
H7	PC*CA⇒ FP	1.288	3.01	0.004***	Accepted
R-Squared		0.739			
F		96.27			
Prob>F		0.000			
*10% Sign					
**5% Sign					
***1% Sign					

Source: Research Data, 2025

The coefficient of determination (R^2) in Model 1 was 0.689, suggesting that 68.9% of financial performance was controlled by human capital, structural capital, physical capital, and competitive advantage, while the rest was affected by variables outside the model. The F-statistic value of 18.26 with Prob > F = 0.000 < 0.01 indicates that the overall model is statistically significant at the 1% level. Therefore, H0 is rejected and it can be concluded that the independent variables jointly have a significant effect on financial performance.

The results of the hypothesis test adjust for the effects of autocorrelation and heteroscedasticity using fixed effects regression with cluster-robust standard

errors. In order to verify the consistency of these findings, a robustness test was performed using the Driscoll-Kraay standard errors method. The results showed that the hypothesis test results were legitimate because they were consistent with the original findings.

The findings of the Hypothesis 1 (H_1) test demonstrated a strong positive correlation between financial performance, as measured by ROA, and human capital, a proxy for intellectual capital efficiency. These results prove that Indonesian and Malaysian banking sector companies use intellectual capital, especially the human capital component efficiently and effectively, which will make the company achieve higher financial performance. Table 3 shows that the average value of 3.241 implies the performance of intellectual capital by Kamath (2007) into the category of common performers who almost achieve good performers in terms of efficiency. These factors support the hypothesis that human capital, as one component of intellectual capital, can help improve the company's financial performance.

The RBV theory, which holds that effective use of intellectual capital, especially in the human capital component, will positively affect financial performance, is supported by the test's results. Study by Le et al. (2022) found that intellectual capital, including the human capital component has a positive influence on the financial performance of banks in Southeast Asia, and Xu et al. (2023) confirmed the positive impact of human capital on the profitability of financial institutions. Ur Rehman et al. (2022) also detailed through their research the importance of investing in human capital elements to improve financial performance. Therefore, the study's first hypothesis is accepted.

The results of Hypothesis 2 (H_2) testing, do not show a relationship between structural capital variables and financial performance. Table 2 shows that the average value of 3.241 implies the performance of intellectual capital by Kamath (2007) into the category of common performer which almost reaches good performer in terms of efficiency. This condition supports that structural capital as one of the components in intellectual capital is able to support the improvement of the company's financial performance. The study's findings reject the second hypothesis. The value of P, which is not significant at the 5% level of significance, shows that there is not enough data to back up the idea that improving structural capital one of the elements of intellectual capital will improve the financial performance in Malaysia and Indonesia banking companies. In the context of this study, the negative t value (-0.21) further suggests that the impact of structural capital on financial performance is typically negligible or nonexistent.

Study of Ahamad et al, (2022) and Dalwai et al, (2022) consistently for this findings, which suggest that structural capital is not a major element in enhancing financial performance in the banking sector, especially in the ASEAN region. The company's shortcomings in strategically managing systems, processes, and organizational structures are demonstrated by the structural the capital's inability to significantly impact financial performance. According to Ur Rehman et al. (2022), ineffective management of internal processes, especially in terms of information processing and decisions based on data, might reduce the effectiveness of structural capital in supporting financial performance in the banking industry. This is reinforced by Cheng et al, (2022) and Mohammad et al,

(2019) who emphasize that the effectiveness of structural capital depends on the company's objectives as well as the technological and innovation context of each country. As therefore, the second hypothesis was rejected in this research.

The results of the third hypothesis (H_3) test indicate that the financial performance of banks in Malaysia and Indonesia is positively and significantly impacted by physical capital, which is represented by CEE. These findings demonstrate how intellectual capital is used more effectively and efficiently by banking sector organizations in Malaysia and Indonesia, particularly in the physical capital component, which can enhance the financial performance of the organization. The characteristics of intellectual capital data shown by descriptive statistics in Table 3 show that the average value of 3.241 implies the performance of intellectual capital by Kamath (2007) into the category of common performer which almost reaches good performer in terms of efficiency. This condition supports that physical capital as one of the components of IC is able to support the improvement of the company's financial performance.

Ur Rehman et al. (2022), stated that although although physical assets make a contribution, efficiency in their utilization can still improve operational efficiency and profitability, particularly in the financial services industry, which relies on technological support and stable systems. The RBV hypothesis, which maintains that efficient management of invested capital strengthens the business's competitive advantage through physical capital as a strategic asset, is supported by this finding (Asutay & Ubaidillah, 2024). This is congruent with the findings of Le et al. (2022) which indicated that the efficient utilization of physical capital plays a vital role in improving financial performance bank performance in developing countries. Harto et al. (2020) aims that intellectual capital and financial performance of banks in Indonesia found that CEE has a positive relationship with ROA, indicating that the efficiency of capital employed contributes to bank profitability. Xu et al. (2023) also highlighted that the effect of physical capital in creating financial performance might vary based on the economic context and the size of the bank, tending to gain more from investments in physical capital. Therefore, the third hypothesis is accepted in this research.

Hypothesis 4 (H_4) testing results showed the financial performance of Indonesian and Malaysian banks was not impacted by competitive advantage, as measured by AUC. The statistical results do not show evidence that an increase in competitive advantage will be aligned with an increase in the financial performance of Indonesian and Malaysian banking sector companies. According to this research, competitive advantage has a more complicated impact on financial performance even though it is frequently seen as a key component in enhancing business success.

The study by Kaur & Kumar (2024) shows that the application of RBV in the financial industry has more effect on innovation and competitiveness than direct financial performance improvement. Similarly, research by Saroso & Ridwan (2020) found that internal banking resources do not always result in increased profitability due to strict regulations and intense competition. Furthermore Nikmah et al. (2021) found that competitive advantage is more effective in driving long-term growth than direct financial performance improvement. Previous research by Ul Rehman et al. (2023) also found mixed

results regarding the effect of intangible resources on financial performance. This finding indicates that although competitive advantage is important, other factors such as operational efficiency, macroeconomic conditions, or firm-specific characteristics may be more dominant in influencing FP of banks in Indonesia and Malaysia (Xu et al., 2023). As therefore, the fourth hypothesis was rejected in this research.

The findings of testing hypothesis 5 (H_5) revealed a substantial interaction between HCE and the AUC variable, which is considered to indicate competitive advantage on financial performance. These findings demonstrate how intellectual capital is used more effectively and efficiently by banking sector organizations in Malaysia and Indonesia, particularly in the physical capital component, which can enhance financial performance of the organization. This suggests that there is a positive correlation between human capital and financial performance of banks in Malaysia and Indonesia, and that the relationship is not moderated by competitive advantage.

Rochmadhona et al. (2018) stated that the role of competitive advantage as a mediator is not always strong in the ASEAN banking sector, including Indonesia and Malaysia. This study's findings show that when competitive advantage is high, the positive impact of the relationship between human capital and financial performance is diminished. This can occur because intense competition in the banking industry requires companies to continuously adapt to market and regulatory changes, in other words, although human capital contributes to financial performance, high competitive advantage can create additional pressures that reduce the effectiveness of the relationship (Bawono et al., 2023). As therefore, the fifth hypothesis was rejected in this research.

The results of hypothesis 6 (H_6) show that there is no significant evidence that competitive advantage moderates the effect of structural capital on financial performance of banks in Indonesia and Malaysia. The sixth hypothesis is not statistically supported by the study's results, a P value of more than 0.05 at the 5% significance level suggests that there is no positive correlation to support the idea that using competitive advantage as a moderating variable will strengthen the relationship between structural capital and the financial performance of Islamic and Malaysian banking companies.

The findings of Nurseha et al. (2024) indicate that although structural capital and competitive advantage are important elements of corporate strategy, their interaction is not significant enough to show a direct influence on improving financial performance. The existence of competitive advantage is not always able strengthen or bridge the positive relationship between SCE and banking financial performance, according to research by Rochmadhona et al. (2018), which claims that the role of competitive advantage as a mediator does not always show a strong influence. Annisa & Slamet, (2023) also proposed that the relationship between intellectual capital components, such as structural capital, and financial performance is not significantly moderated by competitive advantage. Furthermore, Muchlis (2023) highlighted that the effective utilization of internal resources is crucial to the effectiveness of structural capital in enhancing financial performance, therefore, the impact of structural capital on financial performance

is typically minimal or nonexistent in the absence of an aligned strategy. As therefore, the sixth hypothesis was rejected in this research.

According to the test results of hypothesis 7 (H_7), financial performance in Indonesian and Malaysian banks is positively and significantly influenced by competitive advantage, which modifies physical capital as measured by CEE. This indicates that the higher the competitive advantage owned by the bank, the greater the bank's ability to maximize the efficiency of using physical capital to produce more optimal financial performance.

In the RBV framework, efficient physical capital usage has a greater impact on financial performance if the competitive advantage can be effectively internalized through a robust and directed internal control system (Rabiu et al., 2025). Research by Nguyen et al. (2023), effective corporate governance can increase the favorable impact of operational efficiency on a company's financial performance.. Furthermore, Le & Nguyen (2020) study demonstrated that banks can become more profitable and competitive if they have well-managed physical capital backed by significant competitive advantages. This study's findings not only confirm the RBV theory, but also provides evidence that physical capital integration and competitive advantage are the primary keys to enhancing banks' financial performance in the information economy era. Therefore, the seventh hypothesis is accepted in this research.

The findings of this study offer significant theoretical and practical implications. It strengthens Barney (1991) the RBV theory by confirming that human and physical capital are critical internal resources driving sustainable financial performance, with competitive advantage enhancing this effect. Practically, it highlights the need for banking institutions, particularly in emerging markets like Indonesia and Malaysia, to invest in human capital development and modernize physical infrastructure to boost efficiency and performance. These findings also support policy formulation by encouraging regulators to promote intellectual capital development through supportive regulations and transparent reporting practices.

CONCLUSION

This study concludes that intellectual capital, particularly the components of human capital and physical capital, has a key role of improving the financial performance of the banking industry. This study is consistent with the RBV theory, claims that a company's internal resources and capabilities including intellectual capital, can contribute to long-term competitive advantage. (Barney, 1991). Productivity and profitability have been shown to rise with human capital, while financial performance improves with effective physical capital management. Competitive advantage also strengthens the relationship between physical capital and financial performance as a crucial factor in optimizing corporate assets. Particularly for the banking industry in Indonesia and Malaysia, these findings offer strategic implications for stakeholders in terms of properly directing investment and intellectual capital management policies to achieve sustainable financial performance.

Despite its contributions, this study has several limitations. First, it only adopts a quantitative approach, which may not fully capture the contextual and

behavioral dimensions of intellectual capital management. Second, the study does not account for the potential influence of external macroeconomic factors, such as regulatory changes or economic shocks, which may affect banking performance. Third, the analysis is limited to banking institutions within a specific regional and temporal scope, which may not reflect broader industrial contexts or evolving economic conditions. Future research is therefore recommended to adopt mixed-method approaches, incorporate a broader range of financial and non-financial indicators, and explore the role of organizational culture and leadership in managing intellectual capital more comprehensively.

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