

The Effect of Intellectual Capital on Banking Stability in Countries ASEAN-5

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ABSTRACT: *Banking stability remains a critical concern in ASEAN countries amid increasing global economic uncertainty and financial sector competition. This study investigates the impact of intellectual capital on banking stability in ASEAN-5 countries (Indonesia, Malaysia, Singapore, Thailand, and the Philippines). Intellectual capital is measured using the Value Added Intellectual Coefficient (VAIC), comprising Value Added Capital Employed (VACA), Value Added Human Capital (VAHU), and Structural Capital Value Added (STVA). Banking stability is proxied by the Z-score. Using panel data from commercial banks over the period 2019–2024 and applying a Fixed Effect Model (FEM), the results show that intellectual capital significantly affects banking stability. Empirically, VACA and STVA exhibit a negative effect on bank stability, while VAHU has a positive and significant effect. These findings support Resource-Based Theory, emphasizing the strategic role of human capital in enhancing banking resilience and financial stability in ASEAN economies.*

KEYWORDS – *Intellectual Capital, VAIC, Banking Stability, Z-score, ASEAN-5*

I. INTRODUCTION

Financial problems are a common phenomenon that frequently occurs in various companies and sectors, including the banking industry. Concerns about the resilience of the financial sector are also felt by major banks in ASEAN countries. The banking sector plays a crucial role as financial infrastructure that drives economic growth and national and international stability. Therefore, banking resilience and performance are vital aspects for the private sector and nationally, and even globally, especially in ASEAN countries (Onumah, 2019).

Bank growth, reflected in asset and operational expansion, contributes to financial stability by attracting customers, increasing credit, and expanding services, which foster public trust. The rapid development of ASEAN banking is driven by two factors: first, intense competition stemming from ASEAN's position as the world's fourth-largest trading region. Second, integration through the ASEAN Economic Community (AEC) and the ASEAN Banking Integration Framework (ABIF), which promotes efficiency and competitiveness in the regional banking sector (Phan et al., 2019).

The global economic crisis underscored the urgency of banking stability. Instability in this sector can trigger broad systemic impacts. According to the World Bank, crises are often triggered by a combination of high private debt, banking system failures, governance issues, and political intervention that undermines public confidence (Fauziah et al., 2020). Lessons from these crises demonstrate that bank stability depends not only on strong financial capital but also on adaptive and innovative internal capacity. In this context, the management of intangible assets, particularly intellectual capital, is crucial for building resilience to external shocks and managing increasingly complex risks (Boulanouar et al., 2021).

The ASEAN-5 region, comprising Indonesia, Malaysia, Singapore, Thailand, and the Philippines, also felt the domino effect of the global crisis. However, they also have highly diverse economic characteristics and banking structures. This diversity, from levels of economic development to regulatory frameworks, creates unique challenges and opportunities in maintaining banking stability, making studies in this region highly relevant and insightful (Fatoni, 2019).

According to data from the Indonesian Chamber of Commerce and Industry, the average interest rate on bank loans in Indonesia reached 10.4% at the end of 2021, significantly higher than other ASEAN countries, such as Malaysia (4.9%), the Philippines (7.1%), Vietnam (7.7%), and Thailand (4.1%).

The average Non-Performing Loan (NPL) ratio across all ASEAN-5 countries is high, with Indonesia having the highest ratio compared to other countries. In 2022, the NPL ratio increased compared to the previous year, followed by Malaysia, which recorded a 1.4% decrease compared to the previous year, reaching 1.66%, comparable to banks in the Philippines and Thailand. Singapore, on the other hand, had the lowest NPL ratio among the ASEAN-5 countries at 1.26%.

Furthermore, banks provide financial infrastructure that enables intermediation, risk management, and efficient distribution of economic resources. However, the ASEAN Economic Community (AEC), which

promotes regional economic integration, also creates challenges for banking stability. These include increased competition, market volatility, and external shocks such as the global crisis (Rachman et al., 2022).

A comparison of the BOPO ratio percentages in 2021 and 2022 shows that each country experienced a decline, particularly the Philippines, which saw a significant decline compared to other countries, falling to 5.86% in the previous year. Indonesia followed with a 4.82% decline in 2021, and Malaysia's decline to 4.49% in 2022. However, Thailand and Singapore's BOPO ratios were the lowest, at only 4.15% and 0.57%, respectively.

These data indicate significant vulnerabilities and pressures on banking stability in the ASEAN-5 region, requiring a more comprehensive approach to maintaining the resilience of this sector. For example, there has been an increase in the NPL and BOPO ratios in several countries, indicating risks to banking efficiency and asset quality. Indonesia's NPL ratio and average lending rate are higher than those of other ASEAN countries (Ekananda, 2023).

To maintain stability, banks require not only financial capital but also internal capacity strengthening. This strengthening includes innovation, reliable information systems, efficient work processes, and adaptive human resources. All of this can be achieved through effective intellectual capital management. In the ASEAN-5 context, market integration, increased competition, and technological disruption make strengthening intellectual capital increasingly important and relevant (Hang & Trang, 2023).

According to the latest Global Economic Prospects report released by the World Bank, the global economy is projected to slow to 2.9% in 2022, lower than the January projection of 4.1%. This is a significant difference from last year's 5.7% global economic growth (Bachtiar, 2023).

In facing these challenges, intellectual capital is a strategic factor supporting banking competitiveness and stability. Intellectual capital consists of three main components: human capital, structural capital, and customer capital. Intellectual capital plays a crucial role in managing intangible resources, such as human resource expertise, internal systems, and external relationships. In the context of risk management, intellectual capital enhances a bank's ability to detect, assess, and respond to credit, liquidity, and operational risks (Mohapatra et al., 2019).

Research conducted by Onumah and Duho (2019) shows that high levels of intellectual capital, particularly human and structural capital, significantly contribute to increased efficiency and strengthened bank financial resilience. Using the Value Added Intellectual Coefficient (VAIC) approach, efficient use of intellectual capital has been shown to increase added value, strengthening a bank's financial position, thereby reducing the probability of failure or systemic vulnerability. Furthermore, banking stability can be measured using the Z-score, which reflects the level of bankruptcy risk based on profitability ratios, leverage, and asset return volatility.

A bank's ability to maintain its financial position in the face of risk depends heavily on the quality of its intellectual resource management. Value Added Human Capital (VAHU), for example, reflects the extent to which workforce competency can generate added value for the organization. Competent employees directly support strategic decision-making, risk management, and operational efficiency (Elmahgop, 2024).

Intellectual capital is essential because the banking sector is a knowledge-intensive industry. In today's digital era and global competition, banks' competitive advantage is no longer solely determined by physical assets or financial capital, but increasingly relies on their ability to leverage information, relationships, and expertise to create value, innovate, and manage risk effectively (Le & Nguyen, 2020). Therefore, intellectual capital not only impacts efficiency but also forms the foundation for long-term institutional resilience.

The influence of intellectual capital on banking stability lies in its ability to create a system resilient to external shocks. Banks that optimally manage and develop intellectual capital will have an advantage in identifying risks early, creating service innovations, and maintaining customer loyalty. As stated by Asare et al. (2022), banks with high VAIC scores demonstrate more stable financial performance due to their ability to strategically utilize their intellectual capital.

Research on intellectual capital in the banking sector over the past five years has generally focused on financial performance such as ROA and ROE, rather than long-term stability. Studies by Tran and Vo (2022) and Rochmadhona et al. (2025) highlight profitability, while systemic risk, as measured by the Z-score, has not been widely explored. Research results are also inconsistent; Dalwai et al. (2022) and Zheng et al. (2022) state that intellectual capital efficiency, particularly human capital efficiency (HCE), is not always positively related to bank stability or risk-taking in Asia.

Specific research examining the influence of intellectual capital on banking stability in the ASEAN-5 is still limited, despite the region's diverse economic characteristics and banking structures. A combined approach of VAIC and Z-scores is also rarely used. Meanwhile, recent studies such as Hang and Trang (2023) have begun using Z-scores to assess varying levels of systemic risk related to intellectual capital, and Ekananda (2023) suggests that stability through Z-scores better reflects loan market competition than profitability. Fang et al.

(2019) even emphasize that conventional risk approaches can overlook the potential for broader institutional stability.

This study examines the influence of intellectual capital, through the VAIC approach, on banking stability, as measured by the Z-score. This study is important because it fills a gap in the literature and addresses inconsistent results from previous research, particularly in the ASEAN-5 (Al-Shammari, 2022). Amid global pressures and regional competition, intellectual capital is viewed as an intangible asset that supports bank efficiency, risk management, and resilience. Bank stability depends on the complex interaction between human, structural, and employed capital. Therefore, this study aims to analyze in more depth the relationship between intellectual capital and banking stability in ASEAN-5.

Based on the background description above, previous research has yielded different results, providing scope for further research on the influence of intellectual capital on banking stability in ASEAN-5 countries.

II. LITERATURE REVIEW

2.1. Resource Based Theory

Resource Based Theory (RBT) is a model used to highlight new strategic options that emerge naturally from a resource perspective (Wernerfelt, 1984). According to Aguzman (2021), Resource-Based Theory can be used to identify a company's resources and capabilities as sources of sustainable competitive advantage. Resource-Based Theory asserts that ownership and control of strategic assets determine a company's profitability and position it for competitive advantage over its peers.

2.2. Stakeholder theory

The concept of stakeholder theory strengthens the relationship between intellectual capital and banking stability by emphasizing that banks operate not only for internal interests but also must provide value and benefits to various stakeholders: shareholders, employees, suppliers, customers, government, and the community, all of whom, directly or indirectly, contribute to the company's influence. In this context, stakeholders are not only those affected by bank operations but also active partners in value creation. For example, loyal customers (customer capital) and dedicated employees (human capital) directly contribute to a bank's value and stability (Moh et al. 2020).

2.3. Banking Stability

Banking stability refers to the condition in which a country's banking system functions safely, efficiently, and can withstand economic shocks or financial crises. This stability is crucial for ensuring public confidence in the financial system, supporting sustainable economic growth, and resilience to various potential risks (Ozili & Iorember, 2024).

Determining whether a bank is stable requires measurement. Altman (1968) created this analysis to determine whether a company is at risk of bankruptcy, financial distress, or financial health issues. The Z-score indicates the likelihood of bankruptcy or insolvency. The purpose of using the Z-score is to evaluate overall banking stability. Profitability, leverage, and return volatility are incorporated into this approach (Frido Evindey Manihuruk et al., 2024).

The -Score is used as a measure of overall bank risk because it combines profitability (ROA), bank risk as represented by the standard deviation of ROA, and bank safety and soundness indicators as measured by the equity-to-assets ratio (Nyangu et al. 2022). It is calculated by summing the average return on assets and equity to total assets divided by the standard deviation of the return on assets.

2.4 Intellectual Capital

Intellectual capital (IC) is an intangible asset and part of hidden value, specifically intellectual assets that are not visible like traditional assets in real terms or on financial statements. Intellectual capital is a resource of knowledge that is difficult to imitate and can be used to create competitive advantage. The knowledge possessed by each member of an organization can add value to the company (Gama et al., 2020).

2.4.1 Costumer Capital

Customer capital is the harmonious relationship/association network a company has with its partners, whether from reliable and qualified suppliers, loyal customers who are satisfied with the company's services, or relationships with the government and the surrounding community. Customer capital can arise from various sources outside the company's environment and can add value to the company. Customer capital encompasses relationships with customers, business partners, and other stakeholders. This recognizes the value derived from these relationships and the importance of customer loyalty and satisfaction. (Simalango, 2023). In this case, KACA is used, which is calculated by dividing the value added (VA) by the capital employed. The capital employed value is obtained by calculating the book value of the equity held by the bank.

2.4.2 Human Capital

Human capital reflects a company's collective ability to generate the best solutions based on the knowledge possessed by its employees. Human capital will increase if the company is able to utilize the knowledge possessed by its employees. Human capital refers to the skills, knowledge, and experience of an

organization's employees and other stakeholders. It encompasses elements such as education, training, expertise, creativity, and problem-solving abilities (Simalango, 2023). In this case, the materials used are calculated from the value added divided by human capital, the value of which is obtained from employee salary and benefit costs.

2.4.3 Structural Capital

Structural capital is the ability of an organization or company to fulfill the company's routine processes and its structure that supports employee efforts to produce optimal intellectual performance and overall business performance, for example: the company's operational system, manufacturing processes, organizational culture, management philosophy and all forms of intellectual property owned by the company. STVA is calculated by dividing structural capital by value added. The structural capital value is obtained from the difference between value added and human capital..

Based on existing theory and supported by previous research, the hypotheses in this study are:

H1 : VACA has a significant impact on banking stability

H2 : VAHU has a significant impact on banking stability

H3 : STVA has a significant impact on banking stability

III. METHOD

The population for this study is all banks in ASEAN-5 collected during the period 2019 - 2023. The sampling in this study consists of 5 countries in ASEAN, namely Indonesia, Malaysia, Singapore, Thailand and the Philippines. This sample was selected based on banks operating in ASEAN-5 countries with data sourced from Bank Focus & World Bank. This study uses a panel data regression test, which is a combination of cross-sectional and time series data. Panel data regression is a type of regression analysis that uses data from several people observed over a certain period of time (Wijayanti et al. 2023). The data analysis technique used to answer the problem formulation uses multiple regression analysis techniques with hypothesis testing using the t test, F test, and coefficient of determination (R^2).

IV. FIGURES AND TABLES

4.1. Descriptive Statistics

Table 1. Descriptive Statistics of Research Variables

	ZSCORE	VACA	VAHU	STVA
Mean	116.4423	6.702463	8.401723	0.877244
Maximum	200.0404	10.85145	13.81226	0.927601
Minimum	44.57101	4.746133	5.534805	0.819325
Std. Dev	28.78155	0.940758	1.484350	0.021734

Based on Table 1, the banking stability variable, which combines the ratio of bank equity capital to total assets, can be used to calculate the Z-score. The average value of the Value Added Capital Employed (VACA) variable is 116.4423, with the highest value for banking stability being 200.0404 and the lowest value for banking stability being 44.57101, with a standard deviation of 28.78155.

The average value of the Value Added Human Capital (VAHU) variable is 6.702463, with a maximum value of 10.85145, and a lowest value of 4.746133, with a standard deviation of 0.940758.

The average value of the Structural Capital Value Added (STVA) variable is 8.401723, with a maximum value of 13.81226, and a minimum value of 5.534805, with a standard deviation of 1.484350.

the average value is 0.877244, the maximum value is 0.927601, the minimum value is 0.819325 with a standard deviation value of 0.021734.

4.2. Test

Table 2. t-Test Results

Variabel	t statistic	Prob
C	9.863523	0.0000
VACA	-38.25966	0.0000
VAHU	5.951840	0.0000
STVA	-6.618665	0.0000

Based on table 2, The probability value of VACA (X1) of 0.000 is lower than α 0.05 with a t-statistic value of -38.25966. This means that VACA (X1) has a significant effect on Z_SCORE (Y), so it can be concluded that the results of the first hypothesis (H1) which states that VACA has a significant effect on Z_SCORE are accepted.

The probability value of VAHU (X2) of 0.000 is lower than α 0.05 with a t-statistic value of 5.951840. This means that VAHU (X2) has a significant effect on Z_SCORE (Y), so it can be concluded that the results of the second hypothesis (H2) which states that VAHU has a significant effect on Z_SCORE are accepted.

The probability value of STAVA (X1) of 0.000 is lower than α 0.05 with a t-Statistic value of -6.618665. This means that STAVA (X1) has a significant effect on Z_SCORE (Y), so it can be concluded that the results of the third hypothesis (H3) which states that STAVA has a significant effect on Z_SCORE are accepted.

4.3. F Test

Table 3. F Test Results

	Hasil Uji
F statistic	1370.770
Prob	0.000000

Based on the results of the F statistical test presented in table 3, above shows that the probability value of the F statistic is at $0.00000 < 0.05$, which means that simultaneously the VACA, VAHU and STAVA variables have a significant influence on the Z_Score variable.

V. CONCLUSION

Based on the results of the data analysis that has been done, the conclusion in this study is that partially Value Added Capital Employed, Value Added Human Capital and Structural Capital Value Added have a significant effect on Banking Stability in ASEAN 5 Countries. Simultaneously, intellectual capital has a significant effect on banking stability, with a coefficient of determination of 99.57%, which indicates that the independent variables are able to explain variations in banking stability strongly. This study only uses independent variables such as intellectual capital, further research needs to pay attention to other variables that are not studied.

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