Intellectual Capital's Role in Enhancing Profitability During the Pandemic: A Comparative Study of Indonesia and Thailand

Laurentia Yuke Elsinta[1], Maria Asumpta Evi Marlina[2]*, Cliff Kohardinata[3]

AFFILIATION:
[1,2,3]Faculty of Management & Business, Universitas Ciputra Surabaya, Indonesia

***CORRESPONDENCE:**
emarlina@ciputa.ac.id

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Abstract

COVID-19 had a dual effect on Indonesian and Thai company sub-sectors, dampening profitability while accelerating digital transformation bolstered by intellectual capital (IC) metrics such as VACA, VAHU, STVA, and VAIC. This quantitative study employed purposive sampling across food and beverage, agriculture, electronics, chemical, and automotive sub-sectors, encompassing 55 IDX-listed and 63 SET-listed companies from 2020 to 2022, yielding 354 observations. Data underwent descriptive statistics, classical assumption tests, and multiple linear regression analysis. Results showed significant positive impacts of VACA, VAHU, STVA, and VAIC on profitability in both countries. However, Thailand's firms prioritized structural capital, contrasting with Indonesian firms emphasizing human and intellectual capital. Future research could extend to other developed Asian nations, diverse industries, and explore the MVAIC model to uncover IC's broader profitability impacts.

Keywords: human capital, structural capital, earning before interest and tax, global crisis

Introduction

The global economy has been significantly impacted by the COVID-19 pandemic. As noted by the International Monetary Fund (IMF, 2024), Southeast Asian countries, including Indonesia and Thailand, saw a decline in Gross Domestic Product (GDP) growth. This downturn was particularly pronounced in 2020, the year officially marked by the World Health Organization (WHO) as the onset of the global pandemic. In Southeast Asia, GDP growth plummeted to -3.1%, marking the region's lowest since the Asian financial crisis of 1997-1998 (Oikawa, Todo, Ambashi, Kimura, & Urata, 2021).

Figure 1 illustrates the economic trajectory of Southeast Asia, Indonesia, and Thailand from 2019 to 2023, highlighting the impact of COVID-19 on their GDP growth. Before the pandemic in 2019, these regions showed stable economic growth. However, with the onset of COVID-19 in 2020, economic expansion slowed significantly. By 2021, GDP growth began to recover but did not reach the pre-pandemic levels observed in 2019. In 2022, GDP growth fully rebounded and even surpassed the 2019 levels, despite COVID-19 not yet transitioning fully into an endemic phase. This recovery

signaled an improving economic outlook for Southeast Asia in 2022, coinciding with the burgeoning digital economy estimated to reach $200 billion (SEADS, 2023). bsequently, after the World Health Organization WHO (2023) declared COVID-19 no longer a pandemic in 2023, GDP growth in all three regions experienced a decline. Thus, outheast Asia, Indonesia, and Thailand exhibited stable GDP performance before the COVID-19 pandemic, followed by a downturn during the pandemic, a partial recovery, and a subsequent decline post-pandemic.

While Figure 1 indicates a positive economic trend in Southeast Asia by 2022, global and regional stakeholders must remain vigilant against potential crises. These include geopolitical tensions affecting trade routes in Eastern Europe and the Middle East, China's slowing economic growth in 2024, rising global interest rates that strain debt repayment for developing countries, and escalating climate change impacting natural disaster risks (Cooban, 2024; Gill & Kose, 2024; Gourinchas, 2024; World Bank, 2024). These factors underscore the ongoing challenges and uncertainties that could influence economic stability and growth in Southeast Asia and beyond.

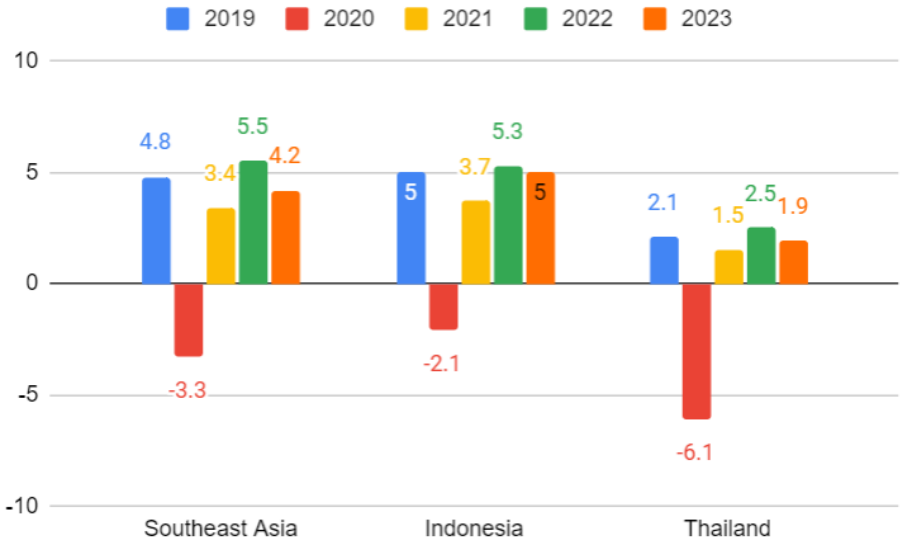

Figure 1. PDB Growth in Southeast Asia, Indonesia, and Thailand
Notes: x-axis is the regions and y-axis is the percentage of GDP growth
Source: (IMF, 2024)

The COVID-19 pandemic profoundly impacted both the economic landscape and the profitability of various industries and sub-sectors. Research has consistently shown adverse effects on sectors such as hospitality, restaurants, and tourism (Rahmadani, 2022), chemicals (Kelen, Liau, & Ole, 2022), and food and beverages (Ilyas & Hertati, 2022). Conversely, studies indicate that the pandemic had minimal impact on sectors like electronics and automotive (Agustina, 2022; Kumajas, Wuryaningrat, & Lembong, 2021), as well as certain segments of the chemicals industry (Prasetyo & Hardiyanti, 2023). In Thailand, COVID-19 negatively affected profitability in sectors such as food and beverages (Manghawa & Siriwong, 2023), agriculture (Thammachote & Trochim, 2021), and oil and gas (Muhlisin & Daryanto, 2021).

Despite its detrimental effects, COVID-19 also catalyzed a positive impact by accelerating digital transformation through technological advancements. This

acceleration was pivotal in facilitating recovery efforts and enhancing long-term competitiveness within global economies (LaBerge, O'Toole, Schneider, & Smaje, 2020; Rizkinaswara, 2021; TBI, 2024; World Bank, 2021). The pursuit of enhanced competitiveness necessitates leveraging intellectual capital (IC), encompassing critical components such as information, knowledge, human capital, and innovation (Gupta, Goel, & Bhatia, 2020). Initiatives like Making Indonesia 4.0 and Thailand 4.0 aim to position these nations among the top ten global economies by 2030 (BOI, 2023; KKBP, 2021), underscoring the indispensable role of IC in expediting the attainment of these ambitious economic goals.

Indonesia and Thailand are actively pursuing Industry 4.0 through the development of intellectual capital (IC). As developing nations with bilateral relations and membership in the ASEAN Economic Community (AEC), both countries share economic and cultural ties that reflect Southeast Asia's diversity. Previous research by Hatane & Kurniawan (2022) indicates that while IC is implicitly regulated through PSAK No. 19 in Indonesia and TAS No. 38 in Thailand concerning intangible assets (Puspita & Wahyudi, 2021; TFAC, 2017), explicit regulation of IC is lacking.

IC constitutes intangible assets that encompass information and knowledge essential for enhancing competitiveness and performance (Salsabila & Rejeki, 2021). Pulic (2000) developed the Value Added Intellectual Capital (VAIC) method, comprising three components: Value Added Capital Employed (VACA), Value Added Human Capital (VAHU), and Structural Capital Value Added (STVA) (Skhvediani, Koklina, Kudryavtseva, & Maksimenko, 2023). Human Capital encompasses skills, knowledge, and competence, evident through salaries, wages, and benefits, crucial as the labor market demands increasingly skilled professionals (Marlina & Basuki, 2023). Structural Capital reflects the company's capacity to support optimal employee performance, while Capital Employed represents the company's financial capital (Sietas, Widianingsih, & Ismawati, 2022). Previous studies consistently demonstrate IC's significant impact on profitability (Andika & Astini, 2022; Harahap & Nurjannah, 2020; Le & Nguyen, 2020; Salsabila & Rejeki, 2021; Tiwari, 2021).

Profitability denotes a company's capacity to generate earnings (Lubis & Dewi, 2020), commonly assessed through metrics such as Return on Assets (ROA), Return on Equity (ROE), and Earnings Before Interest and Taxes (EBIT) Margin. ROA measures profitability relative to assets, including intellectual capital (IC); ROE gauges profitability against equity, a crucial component of IC; and EBIT Margin evaluates profitability excluding interest and tax expenses, thereby offering insights unaffected by fluctuating government policies during the COVID-19 pandemic, such as tax and interest rate changes.

Previous studies have explored the impact of intellectual capital on ROA, revealing varied findings. Some research indicates a positive relationship between IC and ROA (Indriyani & Mudjijah, 2022; Wardani, Widarno, & Kristianto, 2019), while others suggest no significant impact (Putri & Gunawan, 2019; D. Y. Rahayu, Kurniati, & Wahyuni, 2020), or even a negative effect (Farihah & Setiawan, 2020). Similarly, investigations into IC's effect on ROE have produced mixed results, with some studies finding a positive correlation with profitability (Gani, Machmud, & Selvi, 2020; Papíková & Papik, 2022), while others report a negative relationship Farihah & Setiawan (2020). Notably, research by Skhvediani et al. (2023) highlights a significant positive association between intellectual

capital and EBIT, contrasting with findings from Serpeninova, Lehenchuk, Mateášová, Ostapchuk, & Polischuk (2022), who explored the impact of organizational, human, and customer capital on EBITDA and found differing outcomes. These inconsistencies underscore a research gap prompting further exploration.

To address this gap, researchers are increasingly focusing on studying IC as an independent variable and its impact on profitability in Indonesia and Thailand during the COVID-19 pandemic. This study uniquely focuses on sub-sectors aligned with the Making Indonesia 4.0 and Thailand 4.0 initiatives, specifically food and beverages, agriculture, electronics, chemicals, and automotive industries. By comparing data between Indonesia and Thailand, particularly amidst the pandemic, this research aims to provide deeper insights into the relationship between intellectual capital and profitability across different economic contexts.

The COVID-19 pandemic may no longer be classified as a pandemic, but recent developments in 2024 highlight the ongoing need for preparedness, particularly in developing countries. Therefore, this research contributes valuable insights applicable to similar contexts. By examining how global crises impact countries with similar characteristics, this study offers actionable insights for companies and governments to preempt and mitigate future global crises, leveraging intellectual capital (IC) effectively.

From a corporate standpoint, the significance of IC can be understood through the lens of Resource Based Theory (RBT). RBT emphasizes that a company's resources, including intellectual capital, are unique and provide a competitive edge in the market (Farihah & Setiawan, 2020; Putri & Gunawan, 2019). Profitability, according to RBT, results from efficient utilization of these resources, with intellectual capital playing a pivotal role (Harahap & Nurjannah, 2020; Tangngisalu, 2022). Effective management of IC components enhances a company's ability to deploy assets, meet consumer demands, and foster robust customer relationships (Wardani et al., 2019). This theory underscores the positive contribution of intellectual capital to profitability, particularly underscored during the COVID-19 pandemic, corroborated by previous research Salsabila & Rejeki (2021) and Andika & Astini (2022). Based on these foundations, the study hypothesizes the following.

H_1: VACA in Indonesia significantly impacts profitability positively.
H_2: VAHU in Indonesia significantly impacts profitability positively.
H_3: STVA in Indonesia significantly impacts profitability positively.
H_4: VAIC in Indonesia significantly impacts profitability positively.
H_5: VACA in Thailand significantly impacts profitability positively.
H_6: VAHU in Thailand significantly impacts profitability positively.
H_7: STVA in Thailand significantly impacts profitability positively.
H_8: VAIC in Thailand significantly impacts profitability positively.

Research Method

This study employed a quantitative research method focusing on companies within the food and beverage, agriculture, electronics, chemical, and automotive sub-sectors listed on the Indonesia Stock Exchange (IDX) and Security Exchange Thailand (SET) from 2020 to 2022. Quantitative methods utilize numerical data and statistical techniques to explore causality or cause-and-effect relationships (Farihah & Setiawan, 2020). Purposive sampling was chosen to select samples based on predefined criteria, ensuring companies

were consistently listed on the IDX and SET throughout the study period. Additionally, selected companies were required not to have incurred losses during the observation period to mitigate bias and accurately assess the impact of intellectual capital on profitability (Septiani, Holiawati, & Ruhiyat, 2019).

The sample criteria were meticulously designed to narrow down the selection to 354 observations from 118 companies, comprising 55 Indonesian firms and 63 Thai firms. These criteria included the availability of financial statements and annual reports, essential for the study's data requirements (Aini & Kristianti, 2020; Andika & Astini, 2022; Indriyani & Mudjijah, 2022; Nabila, 2023; Qurrotulaini & Anwar, 2021). Data collection relied on documentary secondary sources, primarily financial reports and annual disclosures from the IDX, SET, and each company's official website. This methodological approach ensured robust data quality and reliability in examining the relationship between intellectual capital and corporate profitability across the selected sectors and regions.

Table 1. Sample Selection Criteria

No.	Criteria	Indonesia	Thailand	Total
1.	Food and beverage, agriculture, electronics, chemical, and automotive sector companies registered on the Indonesia Stock Exchange (IDX) and Security Exchange Thailand (SET) consecutively for the period 2020-2022.	95	96	191
2.	Companies that did not record a loss during the observation period.	(38)	(33)	(71)
3.	The company has the required data in line with the research variables.	(2)	0	(2)
Number of companies that fulfill all the criteria		55	63	118
Number of observation data (118 x 3 years)				354

Source: Processed Data, 2024

This study focuses on intellectual capital (IC) as an independent variable, a critical component of intangible assets that play a pivotal role within companies but are challenging to measure directly (Harahap & Nurjannah, 2020). IC encompasses knowledge and information that enhance a company's competitive capability, positioning it alongside physical and financial assets as core assets (Salsabila & Rejeki, 2021). Pulic (2000) developed a method to quantify this value through what he termed the Value Added Intellectual Coefficient (VAICTM), emphasizing three main components: Value Added Human Capital (VAHU), Value Added Capital Employed (VACA), and Structural Capital Value Added (STVA) (Harahap & Nurjannah, 2020; Putri & Gunawan, 2019). VAIC is measured by calculating the company's Value Added.

VA = OUT – IN.....(1)

Where,

VA : Value Added

OUT : Outputs are sales of products and services and other revenues of the company

IN : Inputs which are operating expenses other than employee expenses

Employee expenses are excluded fromPulic (2000) consideration of value-added because he asserts that expenditures on employees significantly contribute to value creation and should be viewed as investments (Astari & Darsono, 2020).

Value Added Human Capital (VAHU) encompasses the expertise, productivity, and knowledge of employees within their respective companies. VAIC characterizes human capital through salaries and wages, encompassing commissioners, directors, and laborers alike, during specific periods. VAHU quantifies the value of value added (VA) generated by a company's expenditures on its workforce, highlighting its capacity to derive enhanced value from employee knowledge (Salsabila & Rejeki, 2021).

VAHU = VA/HC.....(2)

Where,

VAHU : Value Added Human Capital
VA : Value Added
HC : Human Capital which consists of salaries, wages, employee benefits, and retirement expenses (Aplasi, Prihatni, & Nasution, 2023; Sunto & Petronila, 2022).

Value Added Capital Employed (VACA) illustrates the company's proficiency in leveraging its resources, including capital assets, to enhance its financial performance (Pulic, 2000; Salsabila & Rejeki, 2021). Capital employed holds significant importance because it constitutes an element that cannot be quantified solely through human or structural capital. In essence, without capital employed, the formation of Intellectual Capital (IC) would not be feasible (Astari & Darsono, 2020).

VACA = VA/CE.....(3)

Where,

VACA : Value Added Capital Employed
VA : Value Added
CE : Capital Employed which represents the company's total equity

Structural Capital Value Added is the value of structural capital required by the company to produce value added. This value is greatly influenced by human capital. Large human capital will minimize structural capital and vice versa (Salsabila & Rejeki, 2021).

STVA = SC/VA.....(4)

Where,

STVA : Structural Capital Value Added
SC : Structural Capital calculated from VA-HC
VA : Value Added

VAIC is further calculated by combining the three components through the following formula:

VAIC = VAHU + VACA + STVA.....(5)

Where,

VAIC : Value Added Intellectual Capital
VAHU : Value Added Human Capital
VACA : Value Added Capital Employed
STVA : Structural Capital Value Added

The dependent variable analyzed in this study is profitability, a crucial metric that assesses a company's capacity to generate earnings (Indriyani & Mudjijah, 2022; Lubis & Dewi, 2020). The significance of profitability extends beyond management, encompassing

its importance for investors and company owners alike (Salsabila & Rejeki, 2021). In this research, profitability is measured using three key ratios: Return on Assets (ROA), Return on Equity (ROE), and Earnings Before Interest and Tax Margin (EBITM).

Return on Assets (ROA) signifies the profitability metric that gauges the efficiency with which a company utilizes its assets to generate earnings. This metric reflects the company's capability to generate profits relative to its asset base (Astari & Darsono, 2020).

ROA = Net income / Total assets.....(6)

Return on Equity (ROE) measures the net profit generated relative to the company's equity or capital base, indicating its efficiency in utilizing shareholder funds (Gani et al., 2020). This ratio provides insight into how effectively the company manages the capital contributed by shareholders to support its operations and growth (Gupta et al., 2020).

ROE = Net income / Total equity.....(7)

Operating Margin or EBIT Margin represents a company's management effectiveness in overseeing operations prior to interest and tax expenses (Ahmad, 2024; Serpeninova et al., 2022). It serves as a metric to assess the efficiency of controlling operational costs while striving to generate revenue or sales (Jayasena & Karunarathne, 2023).

EBIT Margin = EBIT / Revenue.....(8)

The calculated metrics of Return on Assets (ROA), Return on Equity (ROE), and Earnings Before Interest and Tax Margin (EBITM) will undergo Principal Component Analysis (PCA) to derive a composite index representing profitability. PCA serves to streamline the number of dependent variables in research, simplifying their structure and dimensions. This method effectively reduces multiple variables into a cohesive framework for analysis and interpretation, maintaining analytical objectivity (Apollo, 2022; Ferdiana & Sugiyarto, 2022; Jolliffe, 2002)

To mitigate the influence of independent variables on the dependent variable, this study incorporates a control variable: company size. Company size is quantified using the natural logarithm of total assets, a measure designed to normalize for economies of scale (Serpeninova et al., 2022).

Ln_size = Ln(Total aset).....(9)

The observational data aligned with the study's variables were gathered and analyzed using Stata software. Prior to conducting the analysis, a series of data quality assessments were performed. These included descriptive statistical tests to elucidate and summarize the acquired information, as well as classical assumption tests. These tests encompassed a normality test to ascertain the distribution of residuals, a multicollinearity test to evaluate relationships between independent variables via tolerance values and Variance Inflation Factors (VIF), and a heteroscedasticity test to gauge variance inequality.

Subsequently, multiple linear regression analysis was undertaken to explore the impact of independent variables on the dependent variable as defined by the regression model equation. The outcomes of this analysis were subjected to several statistical tests. These encompassed the coefficient of determination (R-squared) to gauge the explanatory power of the independent variables, the F-value test to assess the significance of relationships between independent and dependent variables, and the t-value test to discern specific variable effects (Putri & Gunawan, 2019). Notably, given the

nature of pooled data in this study, an autocorrelation test was deemed unnecessary (Kurniawan, 2019; Prabowo, 2023).

Table 2. Regression Models

Model	Equation
1.	$P_{it} = \alpha + \beta_1 VACA_{it} + \beta_2 ln\_CS_{it} + \varepsilon_{it}$
2.	$P_{it} = \alpha + \beta_1 VAHU_{it} + \beta_2 ln\_CS_{it} + \varepsilon_{it}$
3.	$P_{it} = \alpha + \beta_1 STVA_{it} + \beta_2 ln\_CS_{it} + \varepsilon_{it}$
4.	$P_{it} = \alpha + \beta_1 VAIC_{it} + \beta_2 ln\_CS_{it} + \varepsilon_{it}$

Notes: P is the profitability; α is the constant; β is the slop of independent and control variables; ε is the error term; *i* is the firm/company, and *t* is the year the firm/company's data is used.
Source: Processed Data, 2024

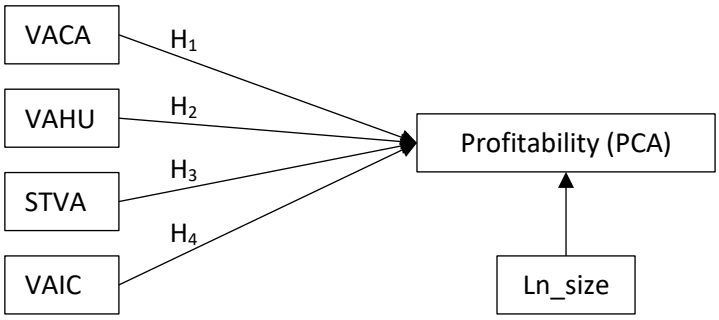

Figure 2. Research Conceptual Framework
Source: Processed Data, 2024

Result and Discussion

The secondary data sourced from IDX, SET, and respective company websites underwent processing to extract relevant variables. Initially, there were 354 observations encompassing 55 Indonesian and 63 Thai companies spanning from 2020 to 2022. During the analysis phase, 74 observations from Indonesian companies and 1 observation from Thai companies were identified as outliers and subsequently removed, resulting in a total of 279 valid observations. To provide a comprehensive understanding of the study's subjects across specified groups, descriptive statistical tests were conducted (Tangngisalu, 2022).

The descriptive statistical tests revealed that among Indonesian and Thai companies, VAHU emerged as the most prioritized Intellectual Capital (IC) component, with mean values of 1.9922 and 1.9409, respectively. Following VAHU, VACA exhibited mean values of 0.2126 for Indonesia and 0.3466 for Thailand, while STVA values were 0.4160 and 0.3797, respectively. VAHU also displayed both the highest minimum and maximum values in both countries. Notably, Thailand recorded a notably higher maximum value for VAHU compared to Indonesia, indicating a significant focus by a particular Thai company on this component.

Subsequently, classical assumption tests were conducted to validate the data before proceeding with multiple linear regression analysis. Each independent variable underwent separate testing to mitigate potential multicollinearity issues resulting from

interdependencies. Consequently, four tests were performed within each country: (1) VACA and ln_size's impact on profitability, (2) VAHU and ln_size's impact on profitability, (3) STVA and ln_size's impact on profitability, and (4) VAIC and ln_size's impact on profitability.

Table 3. Descriptive Statistics

Indonesia				
Variables	Mean	Maximum	Minimum	Std. Dev.
VACA	0.2126	0.6026	0.0320	0.1156
VAHU	1.9922	4.4885	1.0150	0.8469
STVA	0.4160	0.7772	0.0148	0.2090
VAIC	2.6208	5.6495	1.0618	1.0509
ln_size	27.8586	33.6552	18.6568	3.5910
Profitability	-0.7699	1.1859	-1.9458	0.6828
Thailand				
Variables	Mean	Maximum	Minimum	Std. Dev.
VACA	0.3466	0.8984	0.0688	0.1696
VAHU	1.9409	10.6588	1.0066	1.2809
STVA	0.3797	0.9062	0.0066	0.2040
VAIC	2.6672	11.7541	1.2196	1.4180
ln_size	23.0119	31.3161	20.1782	20.1782
Profitability	-0.0535	3.5235	-2.1671	3.5235

Source: Processed Data, 2024

Subsequent to the classical assumption tests, a normality test was employed to examine whether the residuals of the variables exhibited a normal distribution (Tangngisalu, 2022). Following this, a multicollinearity test was conducted to assess any relationships among the independent variables within the study (Antari, Laksamana, & Supraptha, 2023). The results indicated no significant multicollinearity concerns. However, a heteroscedasticity test revealed unequal variances or residuals among observations (Hallauw & Widyawati, 2021). Given this finding, robust statistical treatments were applied to ensure the validity of the statistical techniques, despite the violation of normality assumptions (Hair, Babin, Black, & Anderson, 2019).

Following the validation of classical assumptions, the data underwent multiple linear regression analysis to assess the impact of independent variables—specifically VACA, VAHU, STVA, and VAIC—on profitability. An F-test was employed to determine whether these variables collectively influenced the dependent variable. A significance level of $p < 0.05$ indicated rejection of the null hypothesis (H0) in favor of the alternative hypothesis (Ha), confirming significant effects of the independent variables on profitability (Tangngisalu, 2022). Notably, in both Indonesian and Thai companies, all four independent variables exhibited p-values of $0.00 < 0.05$, underscoring their significant impact on profitability.

The results of the multiple linear regression analysis revealed that in Indonesia, variations in profitability were explained by R-squared values of 12.48% for VACA, 79.68% for VAHU, 76.28% for STVA, and 84.98% for VAIC. The remaining variability, 87.52% for VACA, 20.32% for VAHU, 23.72% for STVA, and 15.02% for VAIC, was attributed to factors outside the scope of this study (Andika & Astini, 2022). Conversely, in Thai companies, R-squared values indicated explanations of profitability by 5.32% for VACA, 32.21% for

VAHU, 62.24% for STVA, and 42.08% for VAIC. The remaining variance, 94.68% for VACA, 67.79% for VAHU, 37.76% for STVA, and 57.92% for VAIC, was attributed to external variables. This comparison suggested that Thailand exhibited lower R-squared values compared to Indonesia, indicating a higher presence of external variables influencing profitability. Additionally, the analysis highlighted that across both countries, R-squared values for VACA tended to be lower compared to other independent variables, suggesting a comparatively weaker ability of the VACA variable to explain profitability.

Table 4. Classical Assumption Test Result

Classical Assumption Test	Result		Summary
	Indonesia	Thailand	
Normality Test	(1) P-value = 0.1499 > 0,05 (2) P-value = 0.0717 > 0,05 (3) P-value = 0.1437 > 0,05 (4) P-value = 0.2107 > 0,05	(1) P-value = 0.1102 > 0,05 (2) P-value = 0.1742 > 0,05 (3) P-value = 0.1847 > 0,05 (4) P-value = 0.6119 > 0,05	Residuals were normal
Multicollinearity Test	(1) 1/VIF = 0.9843 > 0.10, VIF = 1.02 < 10 (2) 1/VIF = 0.9697 > 0.10, VIF = 1.03 < 10 (3) 1/VIF = 0.9487 > 0.10, VIF = 1.05 < 10 (4) 1/VIF = 0.9706 > 0.10, VIF = 1.03 < 10	(1) 1/VIF = 0.9997 > 0.10, VIF = 1.00 < 10 (2) 1/VIF = 0.9986 > 0.10, VIF = 1.00 < 10 (3) 1/VIF = 0.9999 > 0.10, VIF = 1.00 < 10 (4) 1/VIF = 0.9990 > 0.10, VIF = 1.00 < 10	There were no multicollinearity
Heterosceda sticity Test	(1) P-value = 0.0523 > 0.05 (2) P-value = 0.6846 > 0.05 (3) P-value = 0.0048 < 0.05 (4) P-value = 0.0818 > 0.05	(1) P-value = 0.4301 > 0.05 (2) P-value = 0.0002 < 0.05 (3) P-value = 0.0000 < 0.05 (4) P-value = 0.0000 < 0.05	Heterosced asticity occurred, which was treated with the robust method.

Source: Processed Data, 2024

The t-test was employed to assess the individual influence of each independent variable on the dependent variable, assuming all other independent variables remained constant (Tangngisalu, 2022). Results from the regression analysis confirmed that in both Indonesia and Thailand, all independent variables (VACA, VAHU, STVA, VAIC) exhibited p-values of 0.00 < 0.05, indicating significant effects (Aini & Kristianti, 2020). Furthermore, the coefficients associated with VACA, VAHU, STVA, and VAIC were consistently positive across both countries. Thus, it can be concluded that all hypotheses posited in this study were supported, suggesting that each independent variable positively and significantly impacts profitability.

In Indonesia, 74 observations were identified and removed as outliers. The dataset predominantly comprised observations from the food and beverage sector (47%), followed by agriculture (32%), with the remaining 21% distributed among chemicals, automotive, and electronics (Sakdiah & Handayani, 2022). Notably, the food and beverage sector demonstrated resilience during the COVID-19 pandemic due to sustained consumer demand for essential goods, buoyed by government policies supporting

investment in waste management, water conservation, and sustainable practices (KKBP, 2022b; KKBP, 2022a). Additionally, Indonesia's leading role in palm oil and vegetable oil production was bolstered by governmental initiatives aimed at enhancing agricultural technology and facilitating exports (KKBP, 2021a) (Rizky, 2023).

Table 5. Multiple Linear Regression

		Indonesia		Thailand	
	Variable	Coef.	P>|t|	Coef.	P>|t|
(1)	VACA	1.7192	0.0050	1.4333	0.0050
	Ln_size	0.0456	0.0019	-0.0765	0.1270
	_cons	-2.4068	0.0000	1.2111	0.3020
	Model	P = -2.4068 + 1.7192 VACA + 0.0456 ln_CS + ε		P = 1.2111 + 1.4333 VACA - 0.0765 ln_CS + ε	
	R-Squared	0.1248		0.0532	
	P-value of F-statistic	0.0028		0.0064	
(2)	VAHU	0.7115	0.0000	0.5253	0.0000
	Ln_size	0.0095	0.3090	-0.0934	0.0040
	_cons	-2.4520	0.0000	1.0773	0.1630
	Model	P = -2.4520 + 0.7115 VAHU + 0.0095 ln_CS + ε		P = 1.0773 + 0.5253 VAHU - 0.0934 ln_CS + ε	
	R-Squared	0.7968		0.3221	
	P-value of F-statistic	0.0000		0.0000	
(3)	STVA	2.8485	0.0000	4.6266	0.0000
	Ln_size	0.0012	0.9040	-0.0805	0.0000
	_cons	-1.9877	0.0000	0.0427	0.9330
	Model	P = -1.9877 + 2.8485 STVA + 0.0011 ln_CS + ε		P = 0.0427 + 4.6266 STVA - 0.0805 ln_CS + ε	
	R-Squared	0.7628		0.6224	
	P-value of F-statistic	0.0000		0.0000	
(4)	VAIC	0.5929	0.0000	0.5449	0.0000
	Ln_size	0.0089	0.2650	-0.0932	0.0010
	_cons	-2.5730	0.0000	0.6383	0.3750
	Model	P = -2.5730 + 0.5929 VAIC + 0.0089 ln_CS + ε		Y = 0.6383 + 0.5449 VAIC - 0.0932 ln_CS + ε	
	R-Squared	0.8498		0.4208	
	P-value of F-statistic	0.0000		0.0000	

Notes: (1): VACA and ln_size on profitability, (2): VAHU and ln_size on profitability, (3): STVA and ln_size on profitability, (4): VAIC and ln_size on profitability, P is the profitability
Source: Processed Data, 2024

Conversely, only one observation from a Thai chemical company was excluded as an outlier. The chemical sector in Thailand benefited from regional collaborations under the Asia Pacific Economic Cooperation (APEC), which facilitated regulatory harmonization, investment in innovation, and robust waste management strategies during the pandemic (APEC, 2020). Domestic demand for petrochemicals surged in Thailand, supported by increased investments and technological advancements, thereby bolstering the chemical sector's growth and positioning it as an outlier in the Thai data (Global Monitor, 2023).

In summary, the proactive policies implemented by the Indonesian government across various sub-sectors during the COVID-19 pandemic contributed to enhanced Intellectual Capital (IC) and profitability, resulting in the identification of numerous outliers in the Indonesian dataset. Meanwhile, strategic regional initiatives and domestic market dynamics similarly drove growth in Thailand's chemical sector, underscoring its outlier status in the Thai dataset.

Based on the regression analysis conducted, all hypotheses posited in this study were affirmed, indicating that VACA, VAHU, STVA, and VAIC in Indonesian and Thai companies exerted a significant positive influence on profitability, as measured by ROA, ROE, and EBIT Margin. These findings underscored a trend during the pandemic (2020-2022) where companies leaned more towards leveraging intangible assets over tangible assets to bolster profitability. Resource-Based Theory (RBT) lent theoretical support to these findings, asserting that competitive advantage stems from optimal utilization of capital resources, a premise evidenced during the pandemic-driven digital transformation acceleration (LaBerge et al., 2020; Rizkinaswara, 2021; TBI, 2024; World Bank, 2021). Both Indonesia's Making Indonesia 4.0 and Thailand's Thailand 4.0 initiatives, aimed at advancing industrial transformation, aligned with this strategy to enhance intangible asset management (BOI, 2023; KKBP, 2021).

In Indonesian and Thai companies alike, VACA demonstrated a significant and positive impact on profitability, indicating that higher levels of VACA correlated with increased profitability. This finding resonated with previous research by Gani et al. (2020) and Harahap & Nurjannah (2020), highlighting the role of effective capital asset management in enhancing profitability. However, compared to other variables, VACA's influence on profitability was relatively modest, reflected in its lower mean values in both countries. This suggests that companies in Indonesia and Thailand may prioritize human capital and structural capital over capital employed, viewing employee skills, knowledge, routines, systems, and customer databases as pivotal competitive assets (Hatane & Kurniawan, 2022).

VAHU exhibited a notably positive effect on profitability, indicating that higher VAHU levels corresponded to higher profitability. Descriptive statistics revealed that VAHU garnered the highest mean values among the variables, particularly prominent in Indonesia where it achieved an R-squared value of 82.01%. This underscored VAHU's role as the most influential IC component driving profitability in Indonesia, corroborated by findings from Harahap & Nurjannah (2020), Andika & Astini (2022), and Xu, Haris, & Irfan (2022). The rising demand for digital labor in Indonesia further supported these findings (Napitupulu, 2022; PWC, 2023; R. Rahayu & Sedayu, 2023), highlighting that employee skills and experience are pivotal in enhancing resource management and company profitability, particularly in manufacturing Harahap & Nurjannah (2020) and Skhvediani et al. (2023). During economic downturns, companies often prioritize IC, especially human capital, as a means to bolster profitability through innovation in marketing and product development (Xu et al., 2022) (Efrata, Radianto, & Marlina, 2019; Hatane & Kurniawan, 2022).

STVA demonstrated a significant positive impact on profitability, indicating that higher levels of STVA within a company corresponded to higher profitability. This finding underscored the efficient utilization of structural capital in enhancing operational performance (Harahap & Nurjannah, 2020), consistent with prior research by Gani et al.

(2020) and Andika & Astini (2022) Notably, STVA exhibited the highest R-squared value in Thailand, suggesting a stronger influence on profitability in Thailand compared to Indonesia.

Similarly, VAIC was found to have a significant positive effect on profitability, indicating that higher VAIC levels were associated with higher profitability. This finding aligned with research conducted by Indriyani & Mudjijah (2022) and Andika & Astini (2022), highlighting that effective management of Intellectual Capital (IC) enhances a company's competitive advantage and supports increased profitability (Tangngisalu, 2022). Both Indonesia and Thailand managed to mitigate the impacts of the COVID-19 pandemic, allowing IC to maintain a positive influence on profitability, consistent with findings from Xu et al. (2022). Despite VAHU exhibiting the largest R-squared value among IC components in Indonesia, VAIC surpassed it, suggesting that while VAHU contributed significantly to profitability, the combined effect of all IC components through VAIC was even more pronounced.

Furthermore, the study revealed that Thailand's overall R-squared value, which tended to be lower than Indonesia's, indicated that IC and its components—VAIC, VACA, VAHU, and STVA—had a greater influence on profitability in Indonesian companies compared to Thai companies. Profitability in Thailand appeared more influenced by external variables not covered in the study. Challenges in sectors such as agritech, characterized by complex product development and slow market penetration, contributed to lower investor interest. Government policies like a 5-year income tax exemption aimed at startups proved ineffective due to delayed profitability, compounded by a lack of expertise in engineering, design, and limited adoption of agricultural technologies among farmers (Juasrikul & Vadenberg, 2022). In contrast, Indonesian CEOs prioritized long-term investments in digital transformation and emphasized building a skilled, adaptable workforce to successfully implement technological advancements (PWC, 2023). Therefore, Thailand's lower reliance on intangible assets compared to Indonesia explained the relatively lower influence of IC on profitability in Thai companies.

An intriguing finding from this study was the non-significant effect of company size on profitability in Indonesia, contrasting with Thailand where the relationship (except with VACA) was significantly negative. This outcome aligns with research by Yadav, Pahi, & Gangakhedkar (2022), which found a similar negative correlation between company size and profitability in China, India, Israel, and Thailand. The study suggests that while smaller companies initially experience profitability growth with size, larger companies may encounter decreased efficiency over time, leading to reduced profitability. In Thailand, this trend was exacerbated by economic slowdowns predating the COVID-19 pandemic, attributed to factors such as the China-US trade war and drought affecting the agriculture sector concurrently (SCB, 2020). The global disruption caused by the Ukraine-Russia conflict from 2022 further impacted Thailand's economy, driving up fuel and commodity prices (The Nation, 2022). Moreover, regulatory measures by the Bangkok Metropolitan Administration, such as the closure of businesses like golf courses and shopping malls, added to financial pressures on large corporations, prompting some to adopt remote work options for employees (Asadullah & Bhula-or, 2020; Yuda, 2020).

In conclusion, this study underscores that developing countries in Southeast Asia, particularly Indonesia and Thailand, may strategically optimize human capital to sustain and enhance profitability during global crises. Indonesia's resilience during the pandemic,

attributed to its focus on human and intellectual capital as comprehensive variables, contrasts with Thailand's emphasis on structural capital efficiency. These findings resonate with Resource-Based Theory (RBT), which posits that Intellectual Capital (IC) serves as a competitive advantage, enabling firms to bolster profitability amidst challenging economic conditions like the COVID-19 pandemic.

Conclusion

This study aimed to explore the relationship between various Intellectual Capital (IC) components and profitability among Indonesian and Thai companies across sectors including food and beverage, agriculture, electronics, chemicals, and automotive listed on the IDX and SET during the COVID-19 pandemic from 2020 to 2022. The findings indicated that VAHU, VACA, STVA, and VAIC each exhibited a significant positive impact on profitability. This suggests that better management of capital efficiency, human resources, and structural capital optimization can lead to enhanced company profitability during economic crises in developing countries like Indonesia. Specifically, focusing on intangible assets such as VAHU can provide competitive advantages crucial for sustaining market competitiveness. In Indonesia, optimizing profitability may further benefit from comprehensive management of intellectual capital alongside VAHU. Conversely, Thai companies were advised to prioritize STVA, given its stronger influence on profitability, reflecting a greater reliance on tangible assets compared to Indonesia.

One limitation of this study was the incomplete financial reporting and data availability from some companies, which affected the calculation of variables. Additionally, the absence of explicit regulations supporting IC application in Indonesia and Thailand posed challenges. Future research could expand the scope by including companies from developed Asian economies like Singapore, South Korea, and Japan to enable comparative analysis and enrich the findings. Furthermore, exploring sectors more severely impacted by global crises, such as hospitality, tourism, and mining, would provide deeper insights. Researchers are also encouraged to adopt the Modified VAIC (MVAIC) calculation method in future studies for its efficiency in comparing IC across different companies.

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Appendix

Appendix 1. Comparison of Discussion Between Indonesia & Thailand

	Variable	Indonesia	Thailand
(1)	VACA	Significant Positive (H_1 accepted)	Significant Positive (H_5 accepted)
		• Both were the lowest mean = companies both countries less focus on VACA. • Both were the lowest R-squared = the lowest effect of VACA on profitability among other variables. • Indonesia's R-squared is higher than Thailand's = the ability of Indonesia's VACA to explain profitability is greater than Thailand's.	
	Ln_size	Significant Positive	Not Significant
(2)	VAHU	Significant Positive (H_2 accepted)	Significant Positive (H_6 accepted)
		• Both were the highest mean = companies both countries most focus on VAHU. • The R-squared in Indonesia's VAHU is the largest among other VAIC components = the greatest effect on profitability. • The R-squared on VAHU Thailand is greater than VACA but not greater than STVA = its effect on profitability is moderate. • Indonesia's R-squared is higher than Thailand's = the ability of Indonesia's VAHU to explain profitability is greater than Thailand's.	
	Ln_size	Not Significant	Significant negative
(3)	STVA	Significant Positive (H_3 accepted)	Significant Positive (H_7 accepted)
		• The R-squared in Thailand's STVA is the largest among other variables = the greatest effect on profitability. • Indonesia's STVA R-squared still highest than Thailand's = the ability of Thailand's STVA to explain profitability is greater than Thailand's.	
	Ln_size	Not Significant	Significant negative
(4)	VAIC	Significant Positive (H_4 accepted)	Significant Positive (H_8 accepted)
		• VAIC was the highest R-squared in Indonesia besides VAHU = companies in Indonesia can also focus on IC as a whole. • R-squared VAIC in Thailand was lower than R-squared STVA = Thai companies should focus on STVA rather than overall IC. • R-squared VAIC in Indonesia was higher than Thailand's = the ability of VAIC in Indonesia to influence profitability was greater than Thailand.	
	Ln_size	Not Significant	Significant negative
Another Findings		• All R-squared in Indonesia were greater than Thailand's = Indonesia's profitability was more influenced by IC than	

	Thailand's. • In exception to (1), Ln_size in Indonesia was not significant to profitability. • In exception to (1), Ln_size in Thailand significantly negative impact on profitability.

Notes: (1): VACA and ln_size on profitability, (2): VAHU and ln_size on profitability, (3): STVA and ln_size on profitability, (4): VAIC and ln_size on profitability
Source: Processed Data, 2024