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Assessing the Impact of Intellectual Capitals towards Business and Stock Market Performance for Indonesian Consumer Goods Industries Post AFCTA using VAIC™ Method Ergo Number

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Abstract

This study investigates the influence of Intellectual Capital (IC) on the profitability and market valuation of consumer goods companies listed on the Indonesia Stock Exchange (IDX) during the 2012–2018 period. In the era of globalization and increased competition under free trade agreements like the ACFTA, firms are compelled to innovate and strategically utilize their intangible assets to gain competitive advantage. Using the Value Added Intellectual Coefficient (VAIC™) model developed by Pulic (2000), this research measures IC efficiency through components of human capital, structural capital, and capital employed. Employing panel data regression to analyze firm-level financial data, this study replicates the approach of Sardo et al. (2018), combining time-series and cross-sectional analysis to minimize omitted-variable bias. The results reveal mixed but noteworthy associations between components of IC and firm performance, indicating that effective IC management may enhance profitability and investor confidence. However, the impact varies across components and years, suggesting that the dynamic use of IC remains underutilized in Indonesia's consumer goods sector. This research contributes to the growing discourse on IC by applying the VAIC™ model in a Southeast Asian context and offers strategic insights for firms to optimize intangible resources for long-term value creation. Implications of the findings encourage firms to invest in knowledge-based assets and recommend policymakers to incorporate IC considerations in corporate governance frameworks.

Keywords: Intellectual Capital, VAIC™, Profitability, Market Valuation, Consumer Goods Sector.

INTRODUCTION

Companies recognize Intellectual Capital (IC) as a crucial asset for generating wealth. Nevertheless, its impact on profitability and stock market valuation remains limited and yields inconsistent results (Alsaqqa, 2012; Gill et al., 2011; Mule et al., 2015). In this dissertation, IC examined the influence of publicly listed companies in Indonesia on profitability and market evaluation (Sardo et al., 2018; Sekaran & Bougie, 2013; Soetanto

& Liem, 2019; Ståhle et al., 2011; Tarmidi, 2010; Zéghal & Maaloul, 2010). Indonesia, located in Southeast Asia, uses the Indonesian Rupiah (IDR) as its official currency. As the largest economy in the region, it actively participates in the G-20, the leading platform for global economic collaboration. Recognized as a newly industrialized nation, Indonesia focuses its economic priorities through both government initiatives and private sector engagement (Cabinet Public Relations Ofiice of the Government of Japan, 2019). Indonesia ranks as the 16th largest economy globally by nominal GDP and holds the 7th position when measured by PPP. In 2018, its nominal GDP was estimated at 1.074 trillion US dollars, while its GDP based on PPP reached approximately 3.481 trillion US dollars (International Monetary Fund, 2019). The country's GDP per capita stood at US$13,120 in terms of PPP, compared to a nominal GDP per capita of US$4,116.

In the first quarter of 2019, Indonesia's manufacturing GDP increased slightly to IDR 555,287.70 billion from IDR 553,239.30 billion recorded in the fourth quarter of 2018, according to Trading Economics (2019). Over the period from 2010 to 2019, the average manufacturing GDP in Indonesia was approximately IDR 466,152.67 trillion, reaching a peak of IDR 559,726.80 trillion in the third quarter of 2018. Meanwhile, Indonesian exports declined by 8.99% year-on-year to USD 14.74 billion in May 2019, falling short of market expectations by 14.7% and continuing a downward trend following a 9.54% drop in the previous month (Trading Economics, 2019). This marked the seventh consecutive month of export contraction, largely due to a 6.44% decrease in non-oil and gas shipments, which fell to USD 13.63 billion, alongside a steeper 31.77% decline in oil and gas exports, which dropped to USD 1.11 billion (Trading Economics, 2019). Between 1960 and 2019, the country's exports averaged USD 4,451.40 million, peaking at USD 18,647.83 million in August 2011, and reaching a historic low of USD 30 million in January 1961. In May 2019, Indonesia reported an unexpected trade surplus of USD 0.21 billion. This figure ranged from a USD 1.45 billion deficit recorded a year earlier to a USD 1.38 billion deficit projected by market analysts. Year-on-year, exports declined by 8.99%, while imports fell more sharply by 17.71%. The trade balance for the first five months of 2019 showed a deficit of USD 2.14 billion, an improvement from the USD 2.87 billion deficit over the same period in 2018. From 1960 to 2019, Indonesia's trade balance averaged USD 732.86 million, with a record surplus of USD 4,641.92 million in December 2006 and another significant surplus of USD 2,501.90 million in April 2019. The country's leading export destinations include China (14%), the United States (11%), Japan (11%), and Singapore (8.6%). Its primary sources of imports are China (22%), Singapore (11%), Japan (9.2%), Thailand, and Malaysia (5.9%) (Trading Economics, 2019).

Knowledge serves as a key competitive advantage for companies. In an environment where competition hinges on knowledge, organizations must develop, sustain, and effectively utilize essential intangible assets to achieve success (Nemlioglu & Mallick, 2017a; Oliveira & Ferreira, 2011). Global competition compels businesses to master

technology and information, as continuous innovation is crucial for remaining competitive in the era of globalization (Kholik & Laeli, 2020; Lestari, 2019; Muharam, 2017; Mule et al., 2015; Sulistyawati, 2024). The ASEAN-China Free Trade Area (ACFTA) poses significant challenges to the business sectors in Indonesia and other ASEAN member states. ACFTA represents a regional free trade agreement between ASEAN and China. Since its implementation on January 1, 2010, the agreement has involved China and six ASEAN countries Indonesia, Malaysia, Singapore, Thailand, the Philippines, and Brunei Darussalam, as illustrated in Figure 1.1. The agreement aims to eliminate trade barriers by removing quotas and reducing import tariffs from 5% to 0%. Under ACFTA, the participating countries have committed to applying uniform free trade policies, including the removal of protective measures, quotas, subsidies, tariffs, and export duties (Tarmidi, 2010).

There are concerns that the ASEAN-China Free Trade Agreement (ACFTA) may lead to an influx of local goods that lack competitiveness, potentially undermining the strength of the domestic economy. Mintaroem (2010) provided a clear analysis of both the benefits and drawbacks of Indonesia's participation in the agreement. Supporters argue that Indonesia’s engagement with ACFTA does not represent a threat of economic domination by China. Nevertheless, rather an opportunity for the exporting of China and ASEAN countries to Indonesia and possibilities for investors in Indonesia to open new fields of a company to absorb labor into Indonesia.

In addition, ACFTA enables Indonesian consumers to access more affordable imported products, thereby enhancing their purchasing power. This perspective contrasts with that of critics who oppose Indonesia’s participation in the ACFTA, primarily due to concerns about its negative impact on local businesses especially micro, small, and medium enterprises (MSMEs). Many of these enterprises remain inadequately prepared to face the intensified competition brought about by globalization.

The introduction of free market policies raises concerns that MSMEs may struggle to survive or even face further decline. Therefore, companies must develop long-term strategic plans, as the integration of ASEAN and Chinese markets in Indonesia may either pose risks or present opportunities. To thrive under ACFTA, businesses must establish a competitive advantage over their counterparts in other ASEAN countries. In this context, knowledge becomes a crucial factor for sustaining business operations, prompting both service and manufacturing firms to adopt learning and growth-oriented strategies.

Organizational learning and development rely on three core components: human resources, systems, and organizational structures. To achieve sustainable growth, a company must consistently strengthen its long-term learning infrastructure. Additionally, internal business processes and customer perspectives play a vital role in determining both short-term performance and long-term success. By focusing on these areas, a

company can effectively fulfill the expectations of both clients and shareholders (Norton & Kaplan, 1996).

Manufacturing firms also depend on skilled, competent, experienced, and creative personnel across both service and commercial roles. Intelligent and innovative employees serve as a unique competitive advantage that competitors cannot easily replicate. Highly qualified professionals are essential for operating and maintaining automated systems, as machines cannot function effectively without human oversight and intervention. To remain competitive and enhance productivity, manufacturers continue to rely on automation. However, these companies often encounter significant challenges in recruiting and retaining employees with the necessary competencies.

Furthermore, college programs often lack a strong focus on STEM (Science, Technology, Engineering, and Mathematics) subjects, resulting in young professionals entering the workforce without essential STEM skills (Navales, 2018). As generational shifts occur, production managers play a critical role in retaining and retraining existing employees while recruiting technologically skilled and well-prepared staff. These efforts directly impact the operational capabilities of factories and the composition of their workforce. Managers must actively acquire, develop, and retain human resources, which represent vital assets for organizational success, as innovative and creative ideas stem from high-quality personnel. The knowledge, skills, and expertise of human resources collectively known as Intellectual Capital (IC) must be effectively utilized and expanded. Starovic and Marr (2003) argue that knowledge has become a primary driver of business growth.

Currently, many Indonesian companies still rely on traditional accounting practices without leveraging advanced information systems. In the era of globalization and the implementation of ACFTA, firms must enhance their information technology, processes, and knowledge management capabilities. Strengthening intellectual capital components such as employee competence, information systems, simulation designs, management, and customer relationships is expected to improve business competitiveness in the free market (Riege, 2005).

Pulic (2000) developed the VAIC™ method to measure intellectual capital (IC), enabling companies to present information in financial statements and accountability reports regarding the efficiency of value creation from both tangible and intangible assets. While many countries have successfully applied this method across various industries, it has not yet been implemented in Indonesia's consumer goods sector.

Given the diversity of countries and industries studied, prior research on the impact of intellectual capital measured by VAIC™ indices shows inconsistent results. Variations in technology development and adoption across countries may also influence the effect of intellectual capital. Additionally, the impact of intellectual capital differs depending on the specific sector examined.

Effective management of intellectual capital generates value that is crucial for businesses to survive in global competition. For example, the UK's Department for Business, Energy and Industrial Strategy (BEIS) publishes information about value-added companies through the "Value Added Scoreboard" (Zéghal & Maaloul, 2010). To remain competitive in the global market, Indonesian companies must begin focusing on optimizing their use of intellectual capital, following the example set by developed nations that have already prioritized IC measurement.

The pharmaceutical industry stands out as a major driver of innovation because it depends entirely on intellectual capital (IC) (Mehralian et al., 2012). This sector serves as a significant reservoir of IC by extensively leveraging human capital and technological expertise, resulting in a research-focused, highly innovative, and well-structured industry. In contrast, consumer goods belong to market-oriented sectors defined by their business focus. The demographics of the target market significantly influence demand in the consumer products industry (Làtas & Walasek, 2016). Additionally, the sector faces intense competition, with numerous businesses, private companies, and home industries dominating the market (Al-Musali & Ismail, 2014). Despite this, investors continue to view the consumer goods industry as attractive, as reflected in the strong performance of the Indonesian capital market (Maditinos et al., 2011). In 2014, the consumer goods price index rose by 22.2%, ranking as the third highest on the Indonesian Stock Exchange (IDX) (Global Business Guide Indonesia, 2016). Positive economic growth projections for 2016, along with significant infrastructure development aimed at improving consumer product distribution, further support the sector's growth (Global Business Guide Indonesia, 2016). The company's excellence depends heavily on its capital structure. Unlike private and home-based businesses that rely on limited personal or joint venture capital, consumer goods companies attract equity from investors. These companies recognize the importance of investor equity in enhancing their business value. To meet market demands and maximize revenue, consumer goods firms must continuously innovate. Therefore, effectively leveraging intellectual capital to optimize overall business efficiency becomes essential (Nemlioglu & Mallick, 2017b).

The study sought to evaluate how intellectual capital influences both business outcomes and stock market performance using the VAIC™ framework. The research analyzed data from consumer goods firms listed on the IDX over the period from 2012 to 2018. It adopted the measurement methods and variables originally developed by Pulic (2000) and further applied by Sardo et al. (2018). While Pulic (2000) pioneered VAIC™ as a tool to quantify intellectual capital, Sardo and colleagues (2018) utilized panel data regression to explore the connections between the variables. By integrating data across different companies and years, the panel data technique minimizes omitted-variable bias and accounts for hidden factors that could influence the findings.

Previous studies that provide significant grounding for this research are by Chen et al. (2005) and Sardo et al. (2018). Chen et al. (2005) demonstrated that intellectual capital

positively influences financial and market performance in listed Taiwanese companies, revealing the importance of human and structural capital efficiency in generating value. Meanwhile, Sardo et al. (2018) expanded on the VAIC™ methodology by applying a panel data regression approach to assess how intellectual capital drives firm performance over time in European contexts. This study builds upon their findings by focusing on the under-researched Indonesian consumer goods sector, providing a contextual novelty in a developing Southeast Asian economy, especially under post-ACFTA conditions. The study introduces a sector-specific, multi-year panel analysis to address the variation in IC utilization and its financial implications, which have yet to be fully explored in Indonesia. This research also contributes a model-based hypothesis linking VAIC™ components to Return on Assets (ROA) and Market-to-Book Value (MtBV), offering more robust inferences for managerial and investor decision-making.

The objective of this study is to evaluate the impact of intellectual capital—measured through the VAIC™ model on both business performance and stock market valuation in Indonesian consumer goods industries listed on the Indonesia Stock Exchange from 2012 to 2018. The expected benefits include providing empirical evidence on how IC influences firm competitiveness, helping management develop policies for intellectual asset investment, guiding investors in long-term strategic decisions, and informing regulators on the need for IC disclosure standardization. These findings are expected to support Indonesian firms in leveraging intangible assets to navigate global market competition more effectively.

METHODS

This research applies a hypothesis-testing approach using comparative methods to explore the differences among variables. The goal is to obtain empirical findings that highlight how intellectual capital (IC) operates within and across individuals, particularly in terms of its interactions and effects. To uncover these dynamics, it is essential to distinguish between organizational contexts and assess the extent to which various influencing factors act independently from one another (Sekaran and Bougie, 2013).

In a research context, variables represent the elements that researchers identify to collect data and draw conclusions. Based on the conceptual framework presented earlier, the study establishes connections between variables. Independent variables are those that initiate changes or influence the development of other variables, also known as conditional variables.

In this study, intellectual capital serves as the independent variable, measured using the VAICTM method developed by Pulic (2000). Conversely, the dependent variable is the one influenced by the independent factor. Here, intellectual capital (VAICTM) is analyzed for its impact on capital market performance and economic outcomes, along with its three main components HCE, SCE, and CEE. These two sets of variables independent and dependent function separately within the scope of this research.

This research utilizes secondary data, which is measured on a ratio scale. Secondary data consists of information originally gathered by other organizations or sources for objectives different from those of the present study. These data are drawn from a range of sources, including digital databases, academic literature, magazines, and other publicly available publications. Specifically, this research utilizes financial reports from manufacturing firms listed on the IDX covering the period from December 31, 2012, to December 31, 2018, as well as IDX Statistics from the same years. The financial reports provide detailed figures such as outstanding shares, net assets, profit after tax, total assets, revenue, interest expenses, salary and wage expenses, tax obligations, and intangible assets. The IDX Statistics offer information on each company's stock prices at year-end. All of these documents were accessed through the official IDX website at www.idx.co.id.

This study employs a documentary method for data collection. The research population consists of all manufacturing companies in the consumer goods sector listed on the Indonesia Stock Exchange (IDX). The observation period spans from 2012 to 2018, chosen due to data availability and the commencement of the ASEAN Free Trade Area (AFTA) implementation in Indonesia starting in 2012. The sample for this study is drawn from the consumer goods sector using a purposive sampling method, which involves selecting companies based on predefined criteria. The criteria include:

a. The company must be part of the consumer goods industry and continuously listed on the IDX throughout the 2012–2018 period without being delisted or withdrawn from public trading;
b. The company's financial reports during this time must show positive net income after tax and positive net assets; and
c. Companies categorized under household equipment are excluded from the sample, as they fall under the "Sensitive Track" classification in AFTA, whereas consumer goods included in this study fall under the "Normal Track" category.

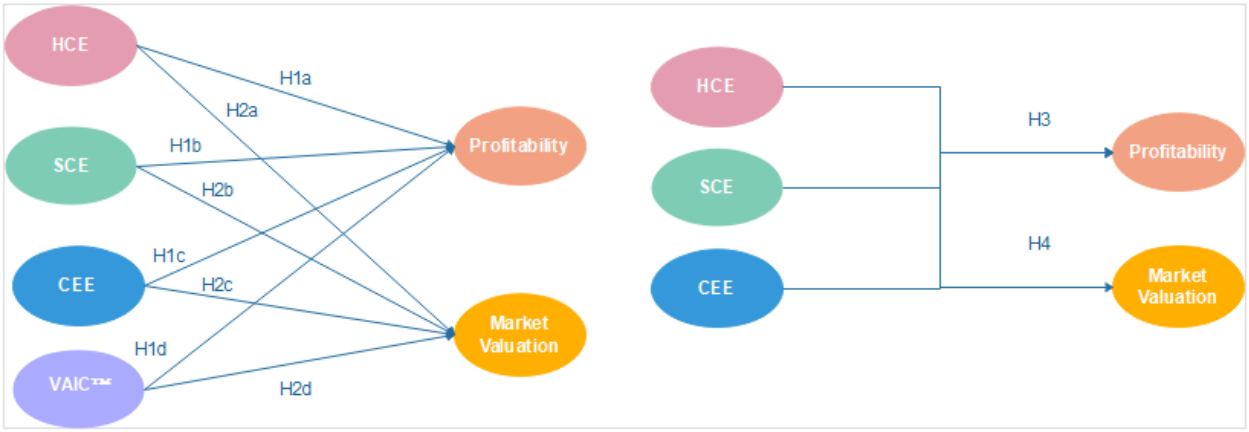

Figure 1. research models

The research models in this study are based on the VAIC^{TM} model, which will be explained in the two following parts

RESULTS AND DISCUSSION

In this study, publicly listed companies within the consumer goods sector are selected as the focus of analysis. Out of a total population of 42 firms, only 23 were included as research samples. This reduction was due to the exclusion of companies with incomplete financial data or those that reported negative net income during the observation period.

Descriptive Statistics Result

Descriptive statistics are used to outline the characteristics of the sample utilized in this study. Table 1 presents a detailed summary of these features, including the mean, standard deviation, variance, as well as the minimum values for both the independent variables CEE, HCE, SCE, and the overall VAICTM and the dependent variables, which are ROA and MtBV. These statistical measures provide a general overview of the data distribution and variability within the sample.

Table 1. Descriptive Statistics Results

	ROA	MTBV	CEE	HCE	SCE	VAIC
Mean	0.1353	6.8536	0.3212	3.0843	0.5339	3.9752
Median	0.0980	3.2348	0.2602	2.6220	0.6186	3.5251
Maximum	0.5267	82.4444	1.1614	7.8916	0.8733	9.7444
Minimum	0.0123	0.0044	0.0221	1.0615	0.0579	1.2428
Std. Dev.	0.1120	12.3646	0.1821	1.6743	0.2201	1.9617
N	161	161	161	161	161	161

Table 1 indicate that the total number of observations used in the study is 161. Based on these observations, the average value of IC, as measured by the VAICTM, is 3.9752. The lowest VAICTM score of 1.2428 belongs to Pyridam Farma Tbk, while the highest score of 9.7444 is attributed to Multi Bintang Indonesia Tbk. The standard deviation of VAICTM is 1.9617, reflecting a moderate variation in IC performance among the companies observed. As the independent variable in this study, VAICTM suggests that, on average, a value-added of 3.9752 is generated for every IDR 1 difference between a company's output and input, highlighting the efficiency with which intellectual capital contributes to business value creation.

The mean value of HCE in this study is 3.0843, which implies that for every IDR 1 invested in human capital, companies are able to generate an added value of 3.0843 through the difference between output and input. The lowest HCE score recorded is

1.0615, representing Pyridam Farma Tbk's efficiency in utilizing its human capital. Conversely, the highest HCE value of 7.8916 is attributed to Multi Bintang Indonesia Tbk, indicating its superior performance in leveraging human resources to create value.

The average SCE in the consumer goods sector is 0.5339, indicating that for every IDR 1 allocated to structural capital such as systems, organizational structure, strategy, and corporate culture companies are able to produce an added value of 0.5339. While Pyridam Farma Tbk recorded the lowest HCE at 1.0615, Multi Bintang Indonesia Tbk achieved the highest HCE with a value of 7.8916, demonstrating a significant disparity in how effectively companies utilize their human resources to generate value.

In the consumer goods sector, capital employed assets measured by CEE show the lowest average value compared to HCE and SCE. Based on the 2012–2018 research sample, the average CEE is 0.3212, indicating that only 32.12% of the capital invested is effectively utilized to generate added value. The lowest SCE recorded is 0.0579, which belongs to Pyridam Farma Tbk, while the highest SCE value reaches 0.8733, highlighting variation in how efficiently structural capital is leveraged across firms (Multi Bintang Indonesia Tbk).

The average ROA in this study is 0.1353, indicating that companies generate an average net profit of approximately 13.53% relative to their total assets. The lowest ROA observed is 0.0123, recorded by Sekar Laut Tbk, while the highest ROA reaches 0.5267, reflecting considerable differences in asset profitability among the firms analyzed (Multi Bintang Indonesia Tbk).

The average company performance, assessed through MtBV over the 2012–2018 period, stands at 6.8536. This means that, on average, the market values the companies in the sample at nearly 7 times their book value of equity. Among the firms analyzed, Tempo Scan Pacific Tbk recorded the lowest MtBV, while the highest MtBV reached an

impressive 82.4444, indicating significant variation in market valuation across the sample (Unilever Indonesia Tbk).

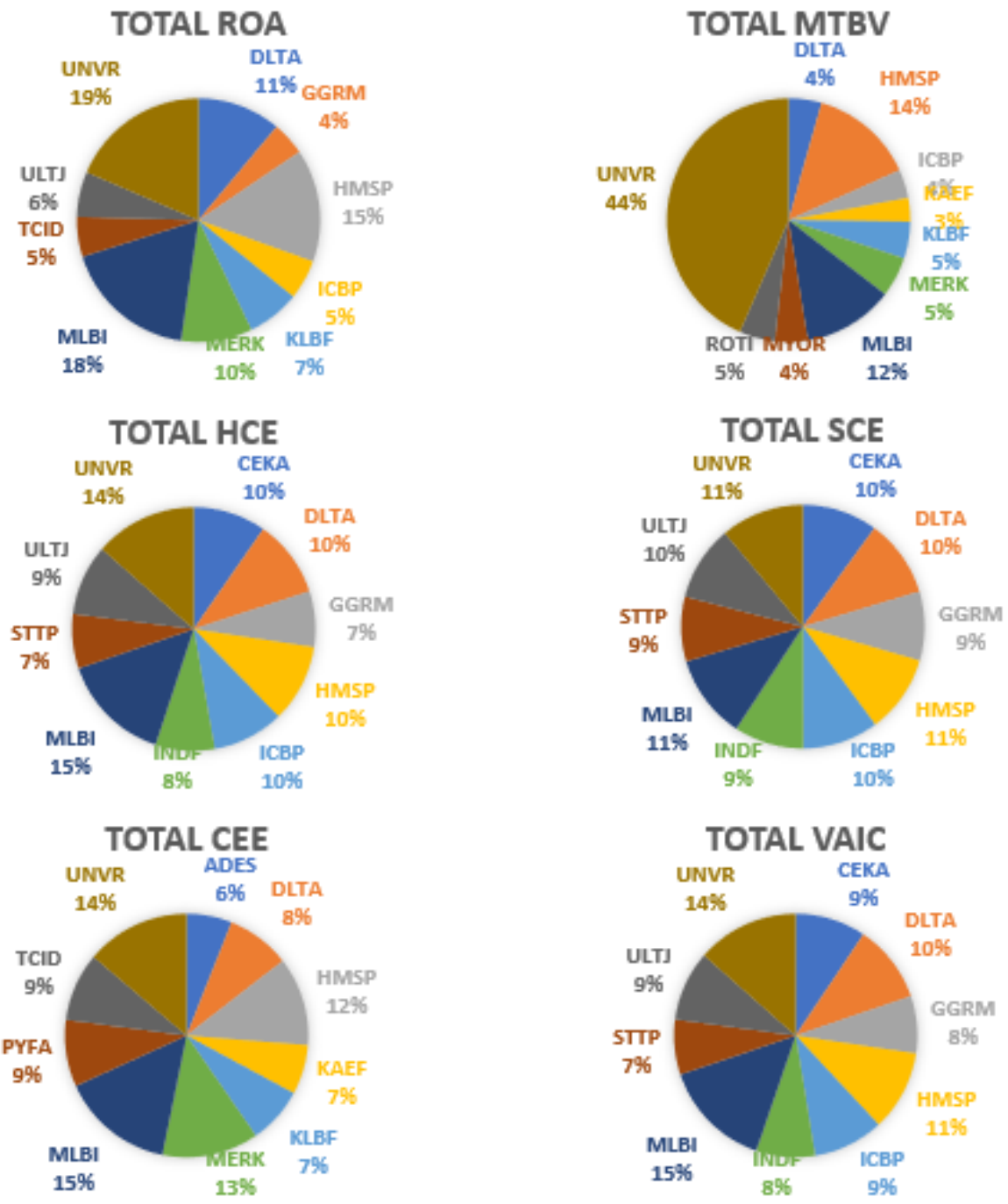

Figure 2. Top 10 of Greatest Value in Each Variable during 2012-2018

The total value of 6 variables during 2012-2018 is shown in Figure 2. The pie chart included the Top 10 firms with the highest value in each variable. As shown in Figure 2, Unilever Indonesia TBK has the highest ROA level of around 19 % of ROA in the consumer goods industry during 2012-2028. Unilever also has the highest value in five other factors. The figure includes 44% of the MtBV, 14% of the HCE, 11% of the SCE, 14% of the CEE and 14% of the VAIC.

On February 26, 2019, the consumer goods inventory index increased by 1.39 percent, surpassing the growth of the other ten sector-specific consumer goods indices. On the same day, transactions involving GGRM shares amounted to IDR 81.51 billion, whereas UNVR shares saw transactions worth IDR 72.62 billion (Hidayat, 2019). These figures highlight that UNVR commands the highest market capitalization and leads across all measured variables.

Results of Estimation Models Selection in Data Panels

The initial stage in conducting panel data regression involves estimating the model using three different approaches: PLS, FEM, and REM. The estimation results based on these methods for the 23 companies included in the study are presented in the following tables.

Table 2. The Panel Data Regression Result of ROA with CEE, HCE, and SCE (comparison between PLS, FEM, and REM)

Dependent Variable: ROA												
	PLS				FEM				REM			
	C	CEE	HCE	SCE	C	CEE	HCE	SCE	C	CEE	HCE	SCE
Coefficient	-0.0999	0.3592	0.0196	0.1039	0.0170	0.1432	0.0048	0.1011	-0.0402	0.2468	0.0150	0.0876
Std. Error	0.0146	0.0275	0.0064	0.0448	0.0159	0.0345	0.0061	0.0419	0.0143	0.0273	0.0055	0.0377
t-Statistics	-6.8399	13.0589	3.0462	2.3173	1.0729	4.1544	0.7787	2.4126	-2.8089	9.0311	2.7444	2.3243
Prob	0.0000	0.0000	0.0027	0.0218	0.2852	0.0001	0.4375	0.0172	0.0056	0.0000	0.0068	0.0214
Adj. R-squared	0.7926				0.9107				0.5572			
Prob(F-statistics)	0.0000				0.0000				0.0000			
Chow Test	Probability Cross-section Chi-square 0.000 < 0.05											
Hausman Test	Probability cross-section random 0.0000< 0.05											
Best Model	Fixed Effect Model (FEM)											

Table 3. The Panel Data Regression Result of ROA with VAIC^{TM} (comparison between PLS, FEM, and REM)

Dependent Variable: ROA						
	PLS		FEM		REM	
	C	VAIC	C	VAIC	C	VAIC
Coefficient	-0.0417	0.0445	0.0485	0.0218	0.0301	0.0265
Std. Error	0.0126	0.0028	0.0130	0.0032	0.0172	0.0029
t-Statistics	-3.3179	15.6999	3.7381	6.8486	1.7572	9.0712
Prob	0.0011	0.0000	0.0003	0.0001	0.0808	0.0000
Adj. R-squared	0.6054		0.9016		0.3208	
Chow Test	Probability Cross-section Chi-square 0.000 < 0.05					
Hausman Test	Probability cross-section random 0.0003< 0.05					
Best Model	Fixed Effect Model (FEM)					

In selecting the appropriate panel data regression model, the Chow test is used to compare the Pooled Least Squares (PLS) model against the FEM. Here, the null hypothesis (H0) assumes that the PLS model is suitable, while the alternative hypothesis (H1) favors the FEM. Following this, the Hausman test is conducted to choose between the REM and the FEM, where the null hypothesis (H0) supports the REM and the alternative H1 supports the FEM.

Tables 2 and 3 present the results from the selection tests for panel data estimation methods, using ROA as the dependent variable. The Chow test results (p-value = 0.0000) are below the 5% significance level, indicating that the FEM is preferred over the PLS model. Similarly, the Hausman test results support FEM as the most suitable estimator. Specifically, the Hausman test p-value is 0.0000 (less than 5%) for the ROA model with three Intellectual Capital components and 0.0003 (also below 5%) for the ROA model using the overall VAICTM measure. In conclusion, the FEM is determined to be the best estimator for both models.

Table 4. The Panel Data Regression Result of MtBV with CEE, HCE, and SCE (comparison between PLS, FEM, and REM)

Dependent Variable: MTBV												
	PLS				FEM				REM			
	C	CEE	HCE	SCE	C	CEE	HCE	SCE	C	CEE	HCE	SCE
Coefficient	-7.4554	23.7335	3.4111	-6.7326	4.1873	2.0311	0.0025	3.5214	1.7544	6.2381	0.6626	1.8461
Std. Error	2.8116	5.2967	1.2417	8.6354	2.4074	5.2251	0.9286	6.3517	2.8473	4.8372	0.8955	6.1417
t-Statistics	-2.6517	4.4808	2.7472	-0.7796	1.7394	0.3887	0.0027	0.5544	0.6162	1.2896	0.7399	0.3006
Prob	0.0088	0.0000	0.0067	0.4368	0.0842	0.6981	0.9978	0.5802	0.5387	0.1991	0.4605	0.7641
Adj. R-squared	0.3687				0.8314				0.0256			
Prob(F-statistics)	0.0000				0.0000				0.0700			
Chow Test	Probability Cross-section Chi-square 0.000 < 0.05											
Hausman Test	cross-section random 0.0012< 0.05											
Best Model	Fixed Effect Model (FEM)											

Table 5. The Panel Data Regression Result of MtBV with VAICTM (comparison between PLS, FEM, and REM)

Dependent Variable: MtBV						
	PLS		FEM		REM	
	C	VAIC	C	VAIC	C	VAIC
Coefficient	-6.5413	3.3696	5.0367	0.4571	2.9271	0.9878
Std. Error	1.8715	0.0422	1.8628	0.4578	2.5658	0.4230
t-Statistics	-3.4953	7.9767	2.7038	0.9984	1.1408	2.3351
Prob	0.0006	0.0000	0.0077	0.3199	0.2557	0.0208
Adj. R-squared	0.2858		0.8334		0.0255	
Chow Test	Probability Cross-section Chi-square 0.000 < 0.05					
Hausman Test	Probability cross-section random 0.0024< 0.05					
Best Model	Fixed Effect Model (FEM)					

Tables 4 and 5 display the results of the panel data model selection tests. Both tests indicate that the FEM is preferred, as the Chow test probability (0.0000) is less than the 5% significance level. Additionally, the Hausman test supports FEM as the most appropriate estimator, with a p-value of 0.0000 below the 5% threshold—when using the three Intellectual Capital components in the MtBV model. In summary, the FEM is confirmed as the best estimator for both models.

Panel Data Regression Results

Table 6 presents the results of the partial tests, indicating that CEE, VAIC, and SCE have a significant positive effect on ROA, while HCE does not show a significant impact. Specifically, CEE and VAIC are significant at the 1% level, and SCE is significant at the 5% level. These outcomes support hypotheses H1b, H1c, and H1d, but not H1a, as HCE's significance level exceeds 5% (refer to Table 4.9). Additionally, Table 4.7 reports the simultaneous test results, where the F-test probability is 0.0000, which is below the 5% significance level ($\alpha = 0.05$). This leads to rejecting the null hypothesis (H0) and accepting the alternative hypothesis (H3), meaning that CEE, HCE, and SCE collectively have a significant influence on ROA.

Table 6. Data Panel Regression Results (FEM) on ROA

Dependent Variable: ROA (FEM)				
	Coefficient	Std. Error	t-Statistics	Prob
C	0.0170	0.0159	1.0729	0.2852
CEE	0.1432	0.0345	4.1544	0.0001
HCE	0.0048	0.0061	0.7787	0.4375
SCE	0.1011	0.0419	2.4126	0.0172
Adj. R-squared	0.9107			
Prob(F-statistics)	0.0000			
Dependent Variable: ROA (FEM)				
	Coefficient	Std. Error	t-Statistics	Prob
C	0.0485	0.0130	3.7381	0.0003
VAIC	0.0218	0.0032	6.8486	0.0001
Adj. R-squared	0.9016			

Table 7. Data Panel Regression Results (FEM) on MtBV

Dependent Variable: MtBV (FEM)				
	Coefficient	Std. Error	t-Statistics	Prob
C	4.1873	2.4074	1.7394	0.0842
CEE	2.0311	5.2251	0.3887	0.6981
HCE	0.0025	0.9286	0.0027	0.9978
SCE	3.5214	6.3517	0.5544	0.5802
Adj. R-squared	0.8314			
Prob(F-statistics)	0.0000			
Dependent Variable: MtBV (FEM)				
	Coefficient	Std. Error	t-Statistics	Prob
C	5.0367	1.8628	2.7038	0.0077
VAIC	0.4571	0.4578	0.9984	0.3199
Adj. R-squared	0.8334			

Table 7 displays the results of the partial tests, indicating that CEE, HCE, SCE, and VAIC do not individually exert a significant positive influence on MtBV. As a result, hypotheses H2a, H2b, H2c, and H2d are not supported. In contrast, the simultaneous test results in Table 6 show an F-test probability of 0.0000, which is below the 5% threshold ($\alpha = 0.05$). This outcome leads to the rejection of the null hypothesis (H0) and acceptance

of the alternative hypothesis (H4), implying that CEE, HCE, and SCE collectively have a meaningful effect on MtBV when evaluated together.

Table 8. Summarize of Panel Data Regression Results

Hypotheses	Description	Coefficient	P-Value	Conclusion
H1a	HCE has a significant positive correlation on the company's ROA	0.0048	0.4375	H1a is rejected (insignificant Positive)
H1b	SCE has a significant positive correlation on the company's ROA	0.1011	0.0172**	H1b is accepted (significant positive)
H1c	CEE has a significant positive correlation on the company's ROA	0.1432	0.0001***	H1c is Accepted (significant positive)
H1d	IC has a significant positive correlation on the company's ROA	0.0218	0.0001***	H1d is accepted (significant positive)
H2a	HCE has a significant positive correlation on the company's MtBV	0.0025	0.9978	H2a is rejected (insignificant positive)
H2b	SCE has a significant positive correlation on the company's MtBV	3.5214	0.5802	H2b is rejected (insignificant positive)
H2c	CEE has a significant positive correlation on the company's MtBV	2.0311	0.6981	H2c is rejected (insignificant positive)
H2d	IC has a significant positive correlation on the company's MtBV	0.4571	0.3199	H2d is rejected (insignificant positive)
H3	HCE, SCE, CEE have a significant correlation on the company's ROA		0.0000***	H3 is accepted (significant simultaneously)
H4	HCE, SCE, CEE have a significant correlation on the company's MtBV		0.0000***	H4 is accepted (significant simultaneously)

The panel data regression model was evaluated using the Chow test, Hausman test, and model comparisons based on Goodness of Fit metrics such as R-Square and adjusted

R-Square, along with t-tests and F-tests. The analysis confirms that the regression model does not suffer from multicollinearity among the independent variables, and that there is no presence of autocorrelation in the residuals or heteroscedasticity within the model. Based on these diagnostic results, the panel data regression equations for this study can be formulated as follows:

$$ROAit = 0.0170 + 0.0048\ HCE_{it} + 0.1011\ SCE_{it} + 0.1432\ CCE_{it} + \varepsilon_{it} \quad \ldots\ldots 1$$

$$ROAit = 0.0485 + 0.0218\ IC + \varepsilon_{it} \quad \ldots\ldots 2$$

$$MtBVit = 4.1873 + 0.0025\ HCE_{it} + 3.5214\ SCE_{it} + 2.0311\ CCE_{it} + \varepsilon_{it} \quad \ldots\ldots 3$$

$$MtBVit = 5.0367 + 0.4571\ IC + \varepsilon_{it} \quad \ldots\ldots 4$$

The Goodness of Fit (R^2) Results

The adjusted coefficient of determination (adjusted R^2) quantifies the extent to which the independent variables account for the variability in the dependent variable. As presented in Table 6, the initial adjusted R^2 value is 0.9107, suggesting that 91% of the changes in ROA are attributable to the intellectual capital elements CEE, HCE, and SCE with the remaining 9% influenced by factors beyond the scope of the model. Similarly, the second adjusted R^2 value in Table 4.7 is 0.9016, meaning that 90% of ROA's variation is explained by the same intellectual capital components, with 10% attributed to other external factors. These results demonstrate a very strong relationship between CEE, HCE, SCE, VAIC, and ROA.

The adjusted coefficient of determination (adjusted R^2) reflects the proportion of the variance in the dependent variable accounted for by the independent variables. According to Table 7, the third adjusted R^2 is 0.8314, indicating that 83% of the fluctuations in MtBV are explained by the intellectual capital components CEE, HCE, and SCE while the remaining 17% is attributed to other external factors not captured by the model. Additionally, the final adjusted R^2 value of 0.8334 in Table 7 reinforces the strong association between CEE, HCE, SCE, the overall VAIC score, and MtBV.

CONCLUSION

This study reveals that IC, assessed using the VAIC™ framework, significantly affects both business outcomes and market valuation in consumer goods firms listed on the Indonesia Stock Exchange. The analysis shows that the three dimensions of IC HCE, SCE, and CEE each exert different levels of influence on financial performance indicators such as ROA and MtBV. These findings emphasize the strategic role that intangible resources play in driving firm value and shaping investor confidence. Particularly in the context of

increased competition following the ACFTA, leveraging intellectual capital becomes essential for maintaining a competitive edge through innovation and effective operations. The insights from this research offer valuable guidance for corporate leaders and regulatory bodies aiming to develop investment policies and reporting practices that prioritize intellectual capital for greater transparency and value enhancement. Future investigations could benefit from exploring additional sectors outside consumer goods and integrating qualitative aspects of intellectual capital like knowledge exchange and innovation performance to deepen the understanding of IC's impact in varied economic settings.

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