THE IMPACT OF INTELLECTUAL CAPITAL ON THE FINANCIAL PERFORMANCE OF LISTED COMPANIES IN INDONESIA STOCK EXCHANGE

by

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DECLARATION

I hereby declare that the work presented in this thesis was conducted in full compliance with the regulations of Universiti Malaysia Sarawak (UNIMAS). Except where proper acknowledgment is given, this work is solely the effort of the author. This thesis has not been accepted for the award of any other degree and is not being **concurrently** submitted for any other academic qualification.

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ABSTRACT

The Indonesian capital market has shown significant sectoral shifts between 2021 and 2023, with financial firms remaining dominant, while infrastructure and consumer sectors have grown, and industrial and technology sectors have declined. These changes highlight that tangible assets alone cannot explain corporate performance, emphasizing the growing importance of intangible assets, particularly intellectual capital (IC), as a key driver of competitiveness and firm value in emerging economies. This study examines the impact of IC on the financial performance of firms listed on the Indonesia Stock Exchange from 2016 to 2022, analyzing how the four IC components: physical, financial, human, and structural capital affect return on assets and market value. Using panel data from 125 manufacturing firms across three sub-sectors, the study employed pooled, fixed effects, and random effects models, with statistical tests confirming that the fixed effects model best captured firm performance, while the random effects model was more suitable for market value. The findings reveal that IC significantly influences firm outcomes, with human capital having the strongest impact on financial performance, followed by financial capital, while physical and structural capital are less significant. Effective management of these resources enhances operational performance, transparency, and investor confidence, supporting Indonesia's innovation-based growth. The study underscores the strategic role of intellectual capital as a foundation for sustainable, knowledge driven development through collaboration between academia, industry, and government, while suggesting that future research should include broader data and qualitative perspectives for a deeper understanding of IC's long term impact.

Keywords: *Intellectual capital, Financial performance, Physical capital, Financial capital, Human capital, Structural capital*

KESAN MODAL INTELEKTUAL TERHADAP PRESTASI KEWANGAN SYARIKAT TERSENARAI DI BURSA SAHAM INDONESIA

ABSTRAK

Pasaran modal Indonesia telah menunjukkan anjakan sektor yang signifikan antara tahun 2021 dan 2023, dengan firma kewangan kekal dominan. Sektor infrastruktur dan pengguna telah berkembang, manakala sektor industri serta teknologi telah merosot. Perubahan ini menunjukkan aset ketara (tangible assets) sahaja tidak dapat menjelaskan prestasi firma dan perlunya menekankan kepentingan aset tidak ketara (intangible assets), terutamanya modal intelektual (IC), sebagai pemacu utama daya saing dan nilai firma dalam ekonomi sedang pesat membangun. Kajian ini mengkaji kesan IC terhadap prestasi kewangan firma-firma yang tersenarai di Bursa Saham Indonesia dari 2016 hingga 2022. Ia menganalisis bagaimana empat komponen IC iaitu modal fizikal, modal kewangan, modal insan, dan modal struktur mempengaruhi pulangan atas aset (ROA) dan nilai pasaran. Dengan menggunakan data panel dari 125 firma perkilangan merentasi tiga sub-sektor, kajian ini menggunakan analisa model data panel iaitu model himpunan (pool), kesan tetap (fixed effects), dan kesan rawak (random effects). Dapatan kajian menunjukkan model fixed effects paling sesuai untuk menerangkan prestasi firma, manakala model random effects lebih sesuai untuk nilai pasaran. Hasil kajian juga menunjukkan IC secara signifikan mempengaruhi prestasi firma, dengan modal insan mempunyai kesan paling kuat ke atas prestasi kewangan, diikuti oleh modal kewangan, manakala modal fizikal dan modal struktur adalah kurang signifikan. Pengurusan sumber-sumber ini yang berkesan meningkatkan prestasi operasi, ketelusan, dan keyakinan pelabur, menyokong pertumbuhan berasaskan inovasi di Indonesia. Kajian ini menekankan peranan strategik modal intelektual sebagai asas kepada pembangunan

mampan dan dipacu pengetahuan melalui kerjasama antara akademik, industri, dan kerajaan. Kajian juga mencadangkan penyelidikan masa depan perlu melibatkan data yang lebih luas dan perspektif kualitatif untuk pemahaman yang lebih mendalam mengenai kesan jangka panjang IC.

Kata kunci: Modal intelektual, Prestasi kewangan, Modal fisikal, Modal kewangan, Modal insani, Modal struktur

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

The field of information technology in recent decades has evolved into a distinct economic system, with information processing, scientific research, and technological innovation emerging as the predominant drivers of productivity. The primary drivers of productivity during the early industrial phase were the education of the workforce and the acquisition of knowledge-based skills. Conversely, productivity in the contemporary economic paradigm is predominantly achieved through integrating technological and managerial processes, which encompasses the utilisation of natural resources, capital, and human capital. The integration is a management concept and constitutes one of the core corporate assets. Furthermore, the economic performance is increasingly driven by the strategic incorporation of capital, human skills, natural resources, and technology. The effective usage of data, innovation, and technical capabilities has also resulted in a significant shift in the foundation of competitiveness from traditional industrial inputs to knowledge-based resources. The transition indicates a broader movement towards a knowledge economy, in which intangible assets and effective information management play a pivotal role in determining productivity and organisational success.

The digital economy has undergone a fundamental transformation in performance dynamics. In particular, it is evident that the contemporary concept of productivity is derived from the integration of capital, human expertise, natural resources, and technology, as opposed to the traditional reliance on industrial inputs. The ability to manage data effectively, to encourage innovation, and to apply technological capabilities has become a decisive factor in determining competitiveness and economic outcomes. The OECD's or

Organisation for European Economic Cooperation (2023) reported that nations and enterprises demonstrating higher proficiency in the utilisation of knowledge and information technology are better positioned to achieve sustainable growth within the knowledge-based economy. This observation lends further support to the discourse that intellectual capital has emerged as a strategic resource for creating value and maintaining long-term competitiveness. Consequently, this standpoint constitutes the theoretical basis of the present study, which investigates the impact of intellectual capital on the financial performance of firms listed on the Indonesia Stock Exchange.

The current global economy is characterised by an increasing exchange of knowledge-based goods and services, with scientific discoveries and technological innovations exerting profound influences on international trade dynamics. Intellectual capital has become a central driver, as products and services derived from knowledge creation are contemporarily traded more extensively across borders compared to traditional commodities. Simultaneously, the international economic trend has highlighted that the accumulation of intangible assets, such as patents, copyrights, brands, and technological expertise, is significantly higher compared to that of tangible assets, including minerals, forest products, and marine resources. The intangible resources are not merely supportive elements but also serve as the foundation for sustaining competitive advantages in the current business environment. Hence, the contemporary business landscape is reflected by a growing reliance on intellectual assets as a strategic asset to achieve market positioning, enhance strategic capabilities, and ensure long-term growth and survival in a highly competitive and innovation-driven global environment.

Intellectual assets have continuously been revealed to play a vital role in determining the success, market position, and development of a firm in the global economy. Relevant

literature has also underscored the substantial influence of intangible assets on enhancing profitability and productivity among corporate entities (Lev & Radhakrishnan, 2003). Companies that can effectively leverage intangible assets tend to innovate and achieve superior performance, which leads to more competitive edges (Kayo et al., 2021). Marr (2018) also emphasised the pivotal function of intangible assets in attaining business success. In addition, intellectual capital is an intangible concept that has been defined through different methods by various scholars (Petty & Guthrie, 2000), with a broad description focusing on producing intellectual properties. Theorists in pertinent fields, such as information technology (IT), innovation research, and technology transfer, have frequently employed the term. According to Zurnali (2010), intellectual capital encompasses all categories of intangible or non-physical assets and resources of an organisation, including processes, innovation capacities, patents, and organisational knowledge. Intellectual capital is not solely associated with individual employees but also related to the collaborative networks and relationships of the organisation. Moreover, intellectual capital can be regarded as a combination of intangible resources and administrative activities employed to achieve the transformation of material, financial, and human resources into a proficient system to generate higher stakeholder value.

This paradigm shift towards knowledge-based economies has resulted in a shift of the base of value addition for corporations from tangible to intangible assets. In this context, the significance of IC management for enhancing productivity and competitiveness becomes paramount. The efficient management of information and communication technology can facilitate the full potential of operations in the services and technology domains by leveraging the expertise of employees and positioning organisations strategically. This strategy is predicated on the premise that human capital can no longer be viewed as a

generator of increased value for organisations, but rather as a catalyst for organisational renewal and sustainable development (Bontis et al., 2000).

As time has passed, the factors that constituted corporate strength have expanded from conventional metrics, such as physical capital and financial assets, to encompass intangible dimensions of knowledge, innovation, and management efficiency. This underscores the necessity for a corporate culture that is balanced, fostering innovation and learning while promoting financial sustainability and efficiency. Consequently, companies that can effectively capitalise on their intangible strengths will be better equipped to sustain their profits and strengthen their balance sheets while resisting the global competitive environment (Margaretha & Rahman, 2006; Chen et al., 2005).

Intellectual capital is defined as a broad category of intangible assets comprising human knowledge, structural assets, and relational assets, which collectively contribute to a company's capacity to generate value. It is evident that, in addition to its intangibility, intellectual capital is capable of facilitating the integration of innovation capabilities, technological flexibility, and knowledge-sharing processes within organisations. This enables organisations to convert their intangible assets into tangible financial results that can bridge the IC and financial performance gaps. Consequently, intellectual capital continues to be a pivotal efficiency driver for organisations seeking to enhance innovation capabilities and maintain organisational growth in the face of evolving economic structures (Zurnali, 2010; Ch'ng et al., 2021; Seo & Lee, 2019).

A strategic understanding of corporate performance requires corporations to recognise that organisational outcomes are shaped by a spectrum of factors instead of by isolated indicators. Performance encapsulates financial metrics that represent profitability and growth potential and non-financial elements that capture how effectively a firm

competes and adapts in a specific environment. Non-financial elements include customer loyalty, brand reputation, employee productivity, innovation capacity, and the efficiency of internal processes. Collectively, both financial and non-financial factors converge to create an integrated framework that enables firms to align resources, anticipate market alterations, and sustain long-term value creation. The multidimensional perspective ensures that performance management does not merely record past achievements but also guides strategic decision-making for future competitiveness. Simultaneously, the concept of financial performance has evolved to encompass a multidimensional framework, which comprises not only economic but also social and environmental outcomes.

Organizational performance is universally recognised as a critical indicator of corporate success and strategic relevance. In their 2018 publication, Mahumudova and Kovacs posit that organisations are able to leverage their extant capabilities by implementing planned performance evaluation, thus simultaneously enhancing any weaknesses. This, in turn, guarantees sustained improvement and responsiveness. In the contemporary business environment, characterised by its dynamism, financial performance is no longer regarded as a static measure of profitability. Instead, it is now considered a dimensional concept, incorporating innovation, efficiency, and strategic balance. Firms that demonstrate the capacity to establish effective connections between these elements can enhance their competitive positioning, consolidate their corporate reputation, and augment their market value. In such a scenario, strong and consistent performance becomes a key vehicle by which organisations create long-term value and sustain investor confidence.

Sustained financial success will be considered one of the primary drivers for value appreciation in the market. However, the correlation between these two factors is complex and can be influenced by factors beyond the control of the company, including

macroeconomic instability, investor sentiment, and other unforeseen fluctuations within the market. Nevertheless, firms with great innovation capability, growth opportunities, and mature intangible resources tend to hold or achieve higher market valuations even after poorer short-run financial success. This dynamism underscores the notion that market value is not solely determined by accounting performance, but is also influenced by investors' perceptions of an enterprise's future direction and strategic positioning within a competitive environment.

From a financial perspective, market value is defined as the price a company achieves in an open market. This is typically represented through market capitalisation, which is the multiple of the existing share price multiplied by the outstanding shares. This is a significant indicator of an organisation's efficacy in converting its resources, including its intellectual capital, into long-term shareholder wealth. As posited by French et al. (2021), market value is indicative of the agreement exchange price between sellers and buyers. Building upon this, Kucharska-Stasiak (2022) further observed that valuation is susceptible to alteration depending on prevailing economic and legal circumstances.

1.2 The Role of Intellectual Capital in Indonesia

The Indonesian economic growth in 2023 exhibited a modest slowdown by reaching 5.05 %. Notwithstanding, the economy continued to demonstrate resilience, which was supported by strong household consumption, sustained investment, and robust export performance. The outcome represented the national capacity to uphold economic stability amidst escalating global uncertainties, which encompassed volatile commodity prices, tightening financial conditions, and accumulating geopolitical tensions. In terms of future projections, Indonesian economic growth was forecasted to remain stable at approximately

5% in 2024. The general outlook indicates that Indonesia is adequately prepared to respond to global dynamics with measured and strategic policy responses despite the ongoing challenges concerning structural issues, including productivity, infrastructure, and human capital. The trends underscore the significance of effectively leveraging intangible assets, particularly intellectual capital, as a pivotal source of long-term competitiveness and sustainable development in a knowledge-based economy. Table 1.1 depicts the development of Indonesian sectoral or industrial indices.

Table 1.1
Development of Indonesia Sectoral or Industrial Indices from 2021to 2023

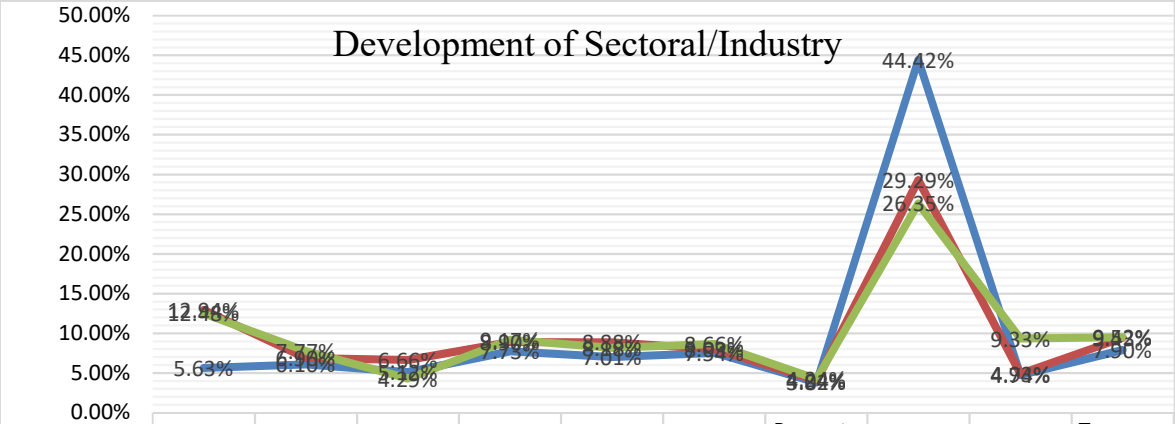
Sectoral/ Industrial Index	2021	2022	2023
Energy	1,139.50	2,279.55	2,100.86
Basic Material	1,234.38	1,216.13	1,307.47
Industrial	1,036.69	1,174.34	722.40
Consumer	1,564.55	1,567.46	1,543.82
Healthcare	1,420.07	1,564.98	1,376.16
Financial	1,526.86	1,414.93	1,458.32
Property and Real Estate	773.06	711.25	714.18
Technology	8,994.44	5,162.04	4,435.61
Infrastructure	959.27	868.64	1,570.03
Transportation and Logistics	1,599.38	1,661.94	1,601.51

Note. Data were adapted from the Indonesia Stock Exchange (IDX) Annual Statistics (2023) and processed by the author. Source: https://www.idx.co.id

Table 1.1 demonstrates a decline to 5.05% in the Indonesian economic growth from the preceding year. Nonetheless, overall development remained stable, which was underpinned by household consumption, investment, and exports. The sectoral data also revealed profound variations in performance. Particularly, the energy index exhibited a

substantial increase from 1,139.50 in 2021 to 2,279.55 in 2022 before a moderation to 2,100.86 in 2023. The industrial sector also experienced a notable decline to 722.40 in 2023 from 1,174.34 in 2022, which suggested the presence of underlying structural challenges. Contrastingly, the consumer sector demonstrated stability at approximately 1,540, and the infrastructure sector exhibited a notable increase from 868.64 in 2022 to 1,570.03 in 2023 due to government-led investment initiatives. The trends posited that the Indonesian economic fundamentals remained robust despite a moderation in sectoral growth. Hence, reinforcing intangible assets, such as intellectual capital, is critical to ensuring sustained competitiveness in the long term.

Figure 1.1
Development of the Indonesian Sectoral or Industrial Indices from 2021 to 2023



	Energy	Basic Material	Industrial	Consumer	Healthcare	Financial	Property & Real Estate	Technology	Infrastructure	Transportation & Logistic
2021	5.63%	6.10%	5.12%	7.73%	7.01%	7.54%	3.82%	44.42%	4.74%	7.90%
2022	12.94%	6.90%	6.66%	8.90%	8.88%	8.03%	4.04%	29.29%	4.93%	9.43%
2023	12.48%	7.77%	4.29%	9.17%	8.18%	8.66%	4.24%	26.35%	9.33%	9.52%

Note. Data were adapted from the IDX Annual Statistics (2023) and processed by the author. Source: https://www.idx.co.id

Figure 1.1 illustrates the progression of Indonesian sectoral performance from 2021 to 2023. The energy sector exhibited a profound increase from 5.68% in 2021 to 12.48% in 2023, whereas the basic materials sector demonstrated a more gradual rise from 6.10% to 7.77% within the same period. The industrial sector reached its zenith at 6.66% in 2022

before declining to 4.29% in 2023. Contrarily, the consumer sector exhibited resilience, which shifted from 7.73% to 9.17%. The healthcare sector experienced a marginal decline from 9.33% in 2021 to 8.18% in 2023, while the property sector remained stagnant with only a modest increase from 3.82% to 4.24%. Technology recorded the highest but volatile growth, which decreased from 44.42% in 2021 to 26.35% in 2023. Infrastructure demonstrated a notable recovery, which rose from 4.93% in 2022 to 9.33% in 2023. Meanwhile, transportation and logistics exhibited consistent growth from 7.90% to 9.52%.

Table 1.2
Market Capitalisation of Indonesian Sectors and Industries (in IDR Trillion)

Sectoral	2021		2022		2023	
	Market Capitalisation					
	Value	%	Value	%	Value	%
Energy	556.41	6.79	1,423.99	15.00	1,429.05	12.25
Basic Material	908.33	11.08	928.23	9.78	1,628.46	14.42
Industrial	385.11	4.70	414.32	4.36	390.74	3.35
Consumer	1,416.11	17.28	1,505.73	15.86	1,584.40	13.58
Healthcare	255.27	3.11	296.50	3.12	258.55	2.22
Financial	3,158.17	38.53	3,390.44	35.71	3,749.23	32.14
Property and Real Estate	243.35	2.97	249.68	2.63	258.74	2.22
Technology	376.84	4.60	402.82	4.24	369.43	3.17
Infrastructure	853.71	10.41	828.43	8.73	1,898.86	16.28
Transportation and Logistics	44.13	0.54	54.26	0.57	44.48	0.38

Note. Data were adapted from the IDX Annual Statistics 2023 and processed by the author. Source: https://www.idx.co.id

Table 1.2 portrays the proportion of the market capitalisation of Indonesian major sectors and industries between 2021 and 2023 in terms of IDR trillion. Specifically, the financial sector consistently maintained the dominant position, with the share increasing

from IDR 3,158.17 trillion (38.53%) in 2021 to IDR 3,749.23 trillion (32.14%) in 2023. The trend underscored the prominent role in the capital market. The infrastructural sector demonstrated notable growth, with an approximately twofold increase from IDR 853.71 trillion (10.41%) in 2021 to IDR 1,898.86 trillion (16.28%) in 2023. The increase reflected increased investment in development projects. The consumer sector also maintained a strong position, which expanded from IDR 1,416.11 trillion (17.28%) in 2021 to IDR 1,584.40 trillion (13.58%) in 2023 and highlighted the continued strength of domestic consumption. Other sectors, including technology, industrial, property and real estate, and healthcare, contributed modestly to economic growth, with relatively stable shares ranging between 2% and 5%. Conversely, the transportation and logistics sector maintained its status as the least significant contributor by consistently accounting for below 1% during the observed period.

The findings highlighted the financial sector as the market leader, whereas infrastructure emerged as one of the fastest-growing industries, along with consumer goods. The trend demonstrated Indonesian reliance on financial services, infrastructural expansion, and household spending as key drivers of growth. The dynamics also emphasised the significance of market value fluctuations for investors. Investors are advised to prioritise shifts in market capitalisation instead of anticipating consistent dividend payments, owing to unguaranteed dividend distribution even in circumstances where firms have reported profits. Therefore, meticulous evaluation of the market value remains imperative due to the inherent risks associated with investment. Fincham and Roslender (2003) also delineated that the concept of intellectual capital can be considered an invisible object that companies frequently struggle to classify and account for in financial statements. Intellectual capital encompasses non-asset, formless, and non-accounting values, which further complicate investment decisions.

The present study examined how financial position and performance through the concept of intellectual capital could support the decision-making process of both investors and firms. Particularly, intellectual capital provides an alternative means of securing funding sources through both tangible and intangible assets. Dumay (2012) posited that effective management and disclosure of intellectual capital are paramount to companies aspiring to enhance market value. Johanson, Koga, Skoog and Henningsson (2006) also elucidated that intellectual capital should be comprehensively understood and evaluated within organisations, as a comprehensive understanding can reinforce the significance of knowledge assets as a predominant form of intangible resources. Moreover, intellectual capital knowledge is increasingly recognised as a vital business object and a strategic resource, which can more effectively sustain value creation and retention. Starovic et al. (2003) also asserted that knowledge has evolved into a novel catalyst for business advancement, which underscores the significance of intellectual capital as a pivotal catalyst for long-term competitiveness.

The significance of intellectual capital is evident among firms listed under the nine sectoral indices of the Indonesia Stock Exchange (IDX). Intellectual capital (IC), which comprises human capital, structural capital and relational capital, represents non-physical resources that foster innovation, efficiency, and long-term value creation. Firms with higher IC values have been revealed to exhibit higher adaptability, the capacity to generate alternative knowledge, and a stronger position in cultivating strong stakeholder relationships. Resultantly, superior future performance can be anticipated. A significant and positive association of the growth of IC has also been uncovered with both financial performance, including profitability and operational efficiency, and market value, such as stock price and investor confidence, which underscores its role as a key determinant of

sustainable competitiveness within the Indonesian capital market. Asadi (2013) also underlined the importance of ensuring proper accuracy and balance in global economic activities for a comprehensive understanding of IC within socio-political and financial contexts. Therefore, companies should proactively enhance and manage intellectual assets as competitive instruments to strengthen their current market position and ensure long-term sustainability in the market.

1.3 Problem Statement

The Indonesian capital market has experienced notable fluctuations across sectoral indices between 2021 and 2023. While the financial sector has historically dominated market capitalisation, other sectors, such as infrastructural and consumer, have demonstrated substantial growth. Meanwhile, the industrial and technology sectors have exhibited a decline over the same period. The variations postulate that corporate performance in Indonesia cannot be sufficiently explicated by tangible resources. Thus, the focus has shifted towards the significance of intangible assets, particularly IC, in sustaining competitiveness, reinforcing financial performance, and increasing market value among emerging economies. The present study also highlighted that the role of IC remained underexplored in the Indonesian Stock Market despite the dynamic shifts in sectoral performance.

Prior scholars constantly identified the prevailing tendency among existing companies to prioritise traditional and tangible assets. Conversely, the strategic contributions of IC through human capital, structural capital and relational capital were scarcely appraised. Specifically, previous studies on IC among emerging economies, including Indonesia, were limited and fragmented. The phenomenon has indicated that the relationship between IC and firm performance requires further investigation (Limijaya, Hutagaol-Martowidjojo &

Hartanto, 2021; Putra & Ratnadi, 2021; Cahyono et al., 2024). Accordingly, the current study measured financial performance in terms of the return on assety (ROA) and market value. Most research on IC has been conducted in developed markets, which has resulted in a paucity of empirical evidence for emerging economies, such as Indonesia. A plethora of previous studies primarily concentrated on traditional-based measures of firm performance, including the return on asset (ROA) and return on equity (ROE). Comparatively, limited research was performed on the IC impact on market value, which neglected a more comprehensive assessment of firm performance. Concurrently, a significant proportion of existing studies continue to rely on the conventional IC model while underutilising the more sophisticated IC approach to more effectively capture value creation. Indonesian firms and regulators also prioritise tangible resources, which indicates a deficiency in comprehending the strategic function of IC in elevating competitiveness and decision-making processes.

The present study explored the influence of IC, which was measured through the Evaluation – Value Added Intellectual Coefficient (Ev-VAIC) as an alternative measurement model, on both financial performance and market value of firms listed in the Indonesian Stock Exchange. The objective is to provide more robust empirical evidence on the role of IC in emerging markets and offer valuable insights for corporate strategies and policy development in Indonesia. The novelty of the current study is the application of an alternative IC measurement model, a conceptual extension, and a contextual application. Specifically, the study proposed an expanded IC framework that incorporated financial capital and physical capital as additional variables, alongside the traditional IC components. The methodological adaptation provided a more comprehensive approach to capturing the multidimensional resources contributing to firm performance in Indonesia, with financial strength and physical infrastructure as critical factors. The integration of financial capital

and physical capital into the intellectual capital (IC) framework, and the linkage with return on asset (ROA) and market value (MV), contributed novel empirical evidence to the strategic role of an expanded intellectual capital (IC) model in boosting corporate performance of listed companies in Indonesia Stock Exchange. Furthermore, the current findings provided significant theoretical and practical implications for investors, practitioners, and policymakers in emerging markets. In addition to enriching academic literature, relevant insights were also offered for regulation and strategy to advance theoretical understanding.

1.4 Research Questions

Specific research questions were formulated according to the general objective, namely to examine the impacts of intellectual capital (IC) on the financial performance of listed companies in Indonesia Stock Exchange.

1.4.1 How do intellectual capital (IC) components, namely physical capital (VAPY), financial capital (VAFI), human capital (VAHU), and structural capital (STVA) affect the return on asset (ROA)?

1.4.2 How do intellectual capital IC components, namely physical capital (VAPY), financial capital (VAFI), human capital (VAHU), and structural capital (STVA) affect the market value (MV)?

1.5 Objectives of the Study

The general study objectives is to investigate the impacts of intellectual capital (IC) on the financial performance of listed companies in Indonesia Stock Exchange from 2016 to 2022. The specific study objectives are

1.5.1 To examine the impact of intellectual capital (IC) components, namely physical capital (VAPY), financial capital (VAFI), human capital (VAHU), and structural capital (STVA) on the return on asset (ROA)

1.5.2 To assess the impact of IC components, namely physical capital (VAPY), financial capital (VAFI), human capital (VAHU), and structural capital (STVA) on market value (MV).

1.6 Research Hypotheses

The following hypotheses were developed based on the research question and objectives study:

H1: Intellectual capital (IC) has a significant impact on the return on asset (ROA) of listed companies in Indonesia Stock Exchange.

H1a: VAPY has a significant impact on ROA.

H1b: VAFI has a significant impact on ROA.

H1c: VAHU has a significant impact on ROA.

H1d: STVA has a significant impact on ROA.

H2: Intellectual capital (IC) has a significant impact on the market value (MV) of listed companies in Indonesia Stock Exchange.

H2a: VAPY has a significant impact on MV.

H2b: VAFI has a significant impact on MV.

H2c: VAHU has a significant impact on MV.

H2d**:** STVA has a significant impact on MV.

1.7 Significance of the Study

This study is significant as it enhances the understanding of intellectual capital (IC) and its impact on return on assets and market value in the context of emerging economies, particularly Indonesia. While extensive research on intellectual capital (IC has been conducted in developed markets, there is limited empirical evidence from developing economies. Therefore, this study provides valuable insights into how intellectual capital (IC) influences firm performance and investor valuation in a dynamic, transitional market. The significance of this study is reflected in three dimensions: academic, managerial, and policy.

1.7.1 Academic Significance

This study holds academic significance by refining and expanding the existing measurement of IC. Building upon Pulic's (2000) VAIC model, it adopts the Ev-VAIC framework as an alternative and more comprehensive approach. The inclusion of physical capital (VAPY) and financial capital (VAFI) as supplementary dimensions enhances the understanding of how different forms of capital contribute to firm value creation. The analysis of both return on asset (ROA) and market value (MV) within the underexplored Indonesian capital market also adds depth to the empirical literature on intellectual capital (IC) in emerging economies. Moreover, the study's findings from the Indonesian market provide useful evidence for developing and transitional economies, where institutional settings, disclosure practices, and market structures differ considerably from those in advanced economies.

1.7.2 Managerial Significance

From a managerial perspective, the study offers meaningful implications for corporate leaders and decision-makers. Understanding which intellectual capital (IC) components exert the most substantial effects on return on asset (ROA) and market value

(MV) can guide firms in optimising resource allocation and strategic planning. For example, if human capital demonstrates strong influence, managers can prioritise investment in employee development and knowledge-sharing initiatives. Likewise, recognising the importance of financial and physical capital enables firms to enhance their financial flexibility and operational infrastructure. These insights allow managers to view IC not merely as an abstract concept, but as a tangible and measurable source of competitive advantage and sustainable growth.

1.7.3 Policy Significance

For policymakers and regulators, this study underscores the relevance of intellectual capital (IC) as a key determinant of firm value and market confidence. The findings may inform policy initiatives that encourage intellectual capital (IC) reporting and disclosure, thus improving transparency and investor protection in the Indonesian capital market. As the current disclosure of intangible resources remains limited compared to global practices, the insights from this study can support efforts to strengthen market integrity and investor trust. Furthermore, the recognition of intellectual capital (IC) as a complementary indicator to traditional financial measures could assist investors and analysts in formulating more accurate valuation models and making better-informed investment decisions, ultimately promoting efficient capital allocation and stronger market performance.

1.8 Scope of Study

The current RO is to assess the relationship between intellectual capital (IC) and the financial performance of firms listed on the Indonesia Stock Exchange from 2016 to 2022. Specifically, the present study employed an adapted and extended Pulic's (2000) model, namely the Ev-VAIC, which integrated four intellectual capital (IC) components, namely

physical capital (VAPY), financial capital (VAFI), human capital (VAHU), and structural capital (STVA). The incorporation of both physical and financial capital signified a pivotal innovation in this study, which transcended the conventional VAIC to offer a more thorough evaluation of intellectual capital. Financial performance was measured via the return on asset (ROA), and market value (MV) was appraised in terms of market capitalisation. The current analysis was restricted to listed firms with complete and publicly available financial data within the study period, with non-listed firms and companies with incomplete data excluded to ensure reliability and comparability of the results. Methodologically, a quantitative approach was adopted, which collected secondary data from the Indonesia Stock Exchange in the context of an emerging economy. The approach contributed to theoretical development in the field of intellectual capital (IC) while simultaneously generating practical insights for a wide range of stakeholders, including managers, investors, and policymakers.

1.9 Organisation of Study

The present study consists of five chapters, with each discussing crucial aspects based on the research question and how intellectual capital influences the financial performance of firms listed on the Indonesia Stock Exchange. An alternative measurement model, namely the Ev-VAIC, was utilised for the investigation. Chapter 1 provides an introduction by presenting the study background and the context of IC in the Indonesian corporate environment. The problem statement, research question, and objectives of study are also delineated. Concurrently, the significance and scope of the current study are delineated. Chapter 2 offers a comprehensive literature review by discussing the theoretical framework and the key concepts of intellectual capital (IC) with relevant components. Relevant empirical study that has explored the linkage between intellectual capital (IC) and

return on asset (ROA) or market value (MV) is also elucidated. Furthermore, the development and relevance of the Ev-VAIC as a measurement model for intellectual capital (IC) is discussed, which establishes the academic context and deficiencies that the present study seeks to address. Chapter 3 explicates the research methodology, research design, data sources, sample selection of firms listed on the Indonesia Stock Exchange, quantitative techniques, and analysis procedures, including how intellectual capital (IC) is quantified through the Ev-VAIC to empirically ascertain the impact of intellectual capital on the defined measures of financial performance and market value. Chapter 4 delineates results and data analysis by detailing the current empirical findings. The discussion commences with sample descriptive statistics before the findings of inferential analyses (regression models), hypothesis testing, and the influences of intellectual capital (IC) components on return on asset (ROA) and market value (MV). Chapter 5 presents a concise conclusion by summarising key findings and study contributions, outlining theoretical contributions and practical applications, acknowledging existing study limitations, and offering recommendations for future study and policy making directions.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The current chapter provides a rigorous and thorough review of the theoretical, conceptual, and empirical bases regarding IC and the linkages with financial performance (ROA) and MV. The review commences by delineating the IC history and demarcating the components in terms of human capital, structural capital, financial capital, and physical capital based on existing seminal studies (Andriessen, 2001; Pulic, 2000; Stewart, 2001). The present chapter also presents the Ev-VAIC, which is employed as a more advanced framework to evaluate of intellectual capital (IC). Compared to the conventional VAIC, the Ev-VAIC distinguishes between physical and financial capital and offers a more comprehensive assessment of how each capital form contributes to organisational value creation. Global and Indonesian empirical research are also discussed. Specifically, increasing recognition of IC as a strategic asset that propels operational performance and market value has been observed. Simultaneously, recent Indonesian studies have focused on elucidating how IC has been measured and linked to firm performance in the Indonesian business setting. Both global and domestic perspectives can assist in enriching the review and enhancing the relevance of the present study. Resultantly, a robust conceptual and empirical foundation is established. Pertinent justifications are also provided for developing a suitable measurement model, and background information is offered for investigating the impact of IC on the profitability and market value of Indonesian listed firms. The foundation for the study framework and hypothesis development is also attained.

2.2 Operational Definition

The Ev-VAIC was employed as an alternative measurement model in the current study to operationalise intellectual capital (IC). Contrary to the conventional VAIC (Pulic, 2000), which appraises intellectual capital (IC) efficiency solely through human capital, structural capital, and capital employed, the Ev-VAIC incorporates two additional components, namely physical capital and financial capital. The addition enables a more holistic and accurate assessment of how tangible and intangible resources contribute to financial performance and market value. Hence, the current study could offer novel insights into existing literature. The Ev-VAIC was calculated through firm-level financial statement data extracted from IDX-listed companies between 2016 until 2022. The measurement commenced with the Value Added (VA) index, namely the difference between total output (gross revenue and other income) and input (all operating expenses excluding labour costs). The VA index is a measure of the recently acquired wealth of a company within a specific period.

The overall Ev-VAIC comprises four components, namely Value Added Physical - Evaluation (VAPY), Value Added Financial - Evaluation (VAFI), Value Added Human - Evaluation (VAHU), and Evaluation - Structural Value Added (STVA). The VAPY assesses how efficiently physical assets (property, plant, and equipment) generate value, whereas VAFI captures the contribution of financial resources (equity and debt) in supporting value creation. Particularly, VAHU evaluates the ability of human capital in terms of salaries, benefits, and training expenditures to generate value. The STVA represents the contribution of organisational processes, systems, reputation, and intangible assets to value creation. Separating physical capital and financial capital from the traditional aggregated measure allows the current study to address a key limitation of the VAIC and highlights the novelty

of the Ev-VAIC. The operational definition also ensures methodological transparency by linking the theoretical construct of IC to measurable firm-level indicators. The resulting Ev-VAIC values served as independent variables to analyse the impact on financial performance, namely ROA and MV. The adoption of the Ev-VAIC is a unique contribution in the current study. Specifically, the conventional IC framework is expanded by incorporating physical and financial capital into existing components (human and structural capital). The innovation guarantees a more comprehensive measurement of IC and increases the explanatory power of the model in capturing the impact of intellectual capital (IC) on the return on asset (ROA) and market value (MV).

Table 2.1
Operational Definition

No.	Variable	Operational Definition	Formula
1.	Ev-VAIC	The Ev-VAIC is a composite index combining four IC components, namely VAPY, VAFI, VAHU, and STVA.	Ev-VAIC = VAPY + VAFI + VAHU + STVA
a.	VAPY	Accumulated physical assets are utilised to produce goods or services to generate income or capital gain.	VAPY = VA / PY
b.	VAFI	Representing financial wealth in the form of corporate funds employed to invest or acquire physical capital	VAFI = VA / FI
c.	VAHU	Referring to the capability of human capital to generate value, including salaries, benefits, and training expenses	VAHU = VA / HC
d.	STVA	Structural capital efficiency is calculated by subtracting human capital from VA, adding intangible assets, and dividing by VA.	STVA = ((VA - HC) + x) / VA

2.	ROA	Measuring the efficiency of utilising total assets to generate pre-tax profit	ROA = Earnings after interest and tax / total assets
3.	MV	Reflecting the real-time market price of a corporate stock and investor perceptions	MV = Σ (closing stock price × transaction volume) / Σ transaction volume

Note. Adapted from the Ev-VAIC and referring to the foundational works of Stewart (2001), Pulic (2000), Andriessen (2001), Van & Wachowicz (2008), and Anoraga (2008)

2.2.1 Intellectual Capital (IC)

The construct emphasises a combination of intellect and capital to convey the importance of knowledge (Serenko & Bontis, 2013). The IC is integral to the existing knowledge corpus across numerous business domains and should not be regarded as an independent scientific field. Kehelwalatenna and Gunaratne (2010) delineated that IC is a valuable resource for competitive advantage by contributing to the financial performance of an enterprise. Furthermore, IC is vital to creating competitive excellence (Kaplan & Norton, 2004). The involvement of a company with IC comprises managing different industries. Mouritsen et al. (2001) also highlighted that IC is a managerial activity attributed to marketing development and organisational restructuring. Several factors contributing to the current business landscape have underscored the significance of IC, such as globalisation, modern technology, relatively free capital, shifting customer demands, increasing innovations, changing economic and political structures, and the role of a country in supporting economic knowledge (Buckley & Carter, 2000). The IC owned by industries is considered knowledge-based equity.

Thorne & Smith (2000) and Volberda et al. (2001) elucidated that IC management is crucial to industrial growth based on knowledge and governmental involvement. Guthrie (2001) also highlighted that intellectual assets can be regarded as an IC, with benefits not

immediately identified but that tend to accrue in the long term (Abeysekera, 2006). In addition, Teegen (2000) expounded that a responsible government is required to create a conducive environment in managing IC owned by firms. Moutrisen et al. (2001b) also explicated that IC is not an ordinary concept, which cannot be solely explained by the result of Market to Book Value or MBV ratio in the stock exchange. Meanwhile, Al Ali (2003) contended that employee knowledge, experience, and brain power, aside from databases, systems, processes and organisational philosophies, are intangible assets of a corporation. Edvinsson et al. (2004) also emphasised that innovation and IC management will significantly transform knowledge into a future asset. Similarly, Choudhury (2010) propounded that IC will constitute the foundation of an organisation and nation and contribute to future development and growth.

The IC plays a fundamental role in value creation. Nevertheless, the capacity to capture and quantify IC has consistently remained a persistent methodological challenge. Earlier approaches, including Pulic's (2000) VAIC, sought to determine IC efficiency. Nonetheless, criticisms were received for oversimplifying tangible resources by combining physical and financial capital. Following Pulic's (2000) framework, the Ev-VAIC was later introduced as an alternative measurement model to capture additional IC components (Batubara et al., 2021a, 2021b). The Ev-VAIC allows for holistically assessing organisational performance by integrating intellectual resources with other value-added components. The emphasis on both efficiency and contribution to value creation across all inputs of the production process is a key principle of the approach. Specifically, the Ev-VAIC does not measure the stock of intellectual capital (IC) but rather the value generated via the utilisation of assets within a knowledge-based organisation. The intellectual capital

(IC) components employed in the present study reflect the elements that drive innovation, competitiveness, reputation, and corporate branding (Sahari & Santy, 2019).

The Ev-VAIC was classified into four distinct components in the current study, namely human capital, structural capital, financial capital, and physical capital. The framework represents a refinement of the traditional VAIC by separating physical capital (VAPY) and financial capital (VAFI) while retaining the essential components of human capital (VAHU) and structural capital (STVA) (Andriessen, 2001; Pulic, 2000; Stewart, 2001). Hence, the Ev-VAIC is a more comprehensive and transparent framework for operationalising IC components through firm-level financial data. The Ev-VAIC primarily calculates the VA index, which is derived from the recently acquired wealth of a firm within a specific period. The calculation is performed by subtracting the output (OUT) from the input (IN). The OUT is gross profit or total revenue with other income sources. The IN includes all expenses of the company, except labour costs:

$$\boldsymbol{VA = OUT - IN}$$

$$\boldsymbol{Ev - VAIC = VAPY + VAFI + VAHU + STVA}$$

$$\boldsymbol{Ev - VAIC = \frac{VA}{PY} + \frac{VA}{FI} + \frac{VA}{HC} + \frac{SC}{VA}}$$

$$\boldsymbol{Ev - VAIC = \left(\frac{VA}{PY}\right) + \left(\frac{VA}{FI}\right) + \left(\frac{VA}{HC}\right) + \left(\frac{(VA - SC) + x}{VA}\right)}$$

The following components were denoted according to relevant theoretical and empirical foundations, with the Ev-VAIC model serving as the operational tool to translate the conceptual elements into measurable indicators:

1. Human capital (VAHU) is defined as the abilities, skills, and experience possessed by employees, which represent the intellectual capability employees contribute to current jobs, innovation, productivity, and organisational value.

Stewart (2001) observed that the capacity for innovation and renewal should be cultivated and sustained through continuous motivation. The "**Value added human – Evaluation**" or VAHU is a metric in the Ev-VAIC model that quantifies the contribution of human capital to value creation through expenditures on salaries, benefits, and training. Mathematically, VAHU is defined as the ratio of VA to human capital (HC):

$$\boldsymbol{VAHU = \frac{VA}{HC}}$$

2. Structural capital (STVA) refers to the institutionalised knowledge and infrastructure retained within an organisation, including databases, processes, patents, information systems, and goodwill ("x" component), despite employee turnover. Stewart (2001) characterised STVA as the residual intellectual value remaining after accounting for human capital, whereas Pulic (2000) described STVA as the remaining value after workers have left the workplace. The "**Evaluation – Structural value added**" or STVA is a component of the Ev-VAIC, which measures how organisational systems, reputation, and intangible assets contribute to value creation. The component also highlights the extent to which structural capital supports and enhances organisational efficiency beyond the contribution of human capital:

$$\boldsymbol{STVA = \frac{SC}{VA}} \text{ or } \boldsymbol{STVA = \frac{(VA - HC) + X}{VA}}$$

3. Physical capital (VAPY) comprises the tangible assets, such as buildings, machinery, equipment, vehicles, and instruments, employed in producing goods and services. The "" or VAPY is fundamental to conventional finance and is regarded as an enabling asset that supports the effective usage of knowledge-

based resources within IC frameworks. According to Andriessen (2001) and Pulic (2000), VAPY should be complemented by IC to optimise value creation in the knowledge economy. The "**Value added physical – Evaluation**" VAPY also refers to the accumulated tangible assets utilised to generate income or capital gains in the Ev-VAIC. The assessment model employs VAPY to ascertain the efficiency of physical capital in generating value:

$$\boldsymbol{VAPY = \frac{VA}{PY}}$$

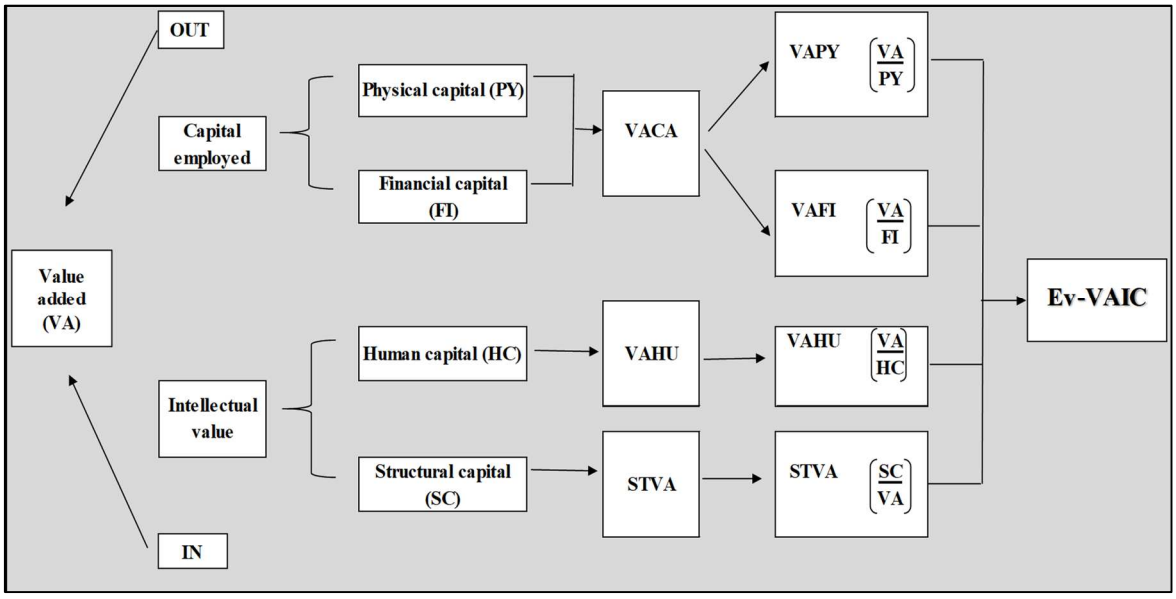
4. Financial capital (VAFI) is delineated as the funds that a corporation employs to finance current operations, investments, and strategic initiatives. The funds are typically in the form of equity, debt, or retained earnings. Stewart (2001) and Andriessen (2001) classified VAFI as a traditional tangible asset that can be examined via conventional bookkeeping methods. The **Value added financial – Evaluation** or VAFI is categorised as capital employed within intellectual capital frameworks, namely the resources allocated to generating value on top of intellectual assets. Therefore, VAFI denotes the financial wealth or purchasing power available to corporations, which is reflected in financial statements and is mathematically defined as the ratio of VA to financial capital:

$$\boldsymbol{VAFI = \frac{VA}{FI}}$$

Earlier approaches, such as Pulic's (2000) VAIC, sought to determine the efficiency of IC through financial-based data. Nonetheless, the VAIC has been criticised for the limited measurement scope, particularly the tendency to aggregate physical and financial capital into a single measure that might oversimplify available tangible resources within a firm (Ståhle et al., 2011; Andreeva & Garanina, 2016). Based upon the Pulic model (VAIC), other

researchers extended the model to the so-called "Ev-VAIC" in order to carry out a more thorough analysis pertaining to intellectual capital (for example Batubara et al., 2021a). The "Ev-VAIC" encompasses four aspects of efficiency related to intellectual capital: physical capital (VAPY), financial capital (VAFI), human capital (VAHU), and structural capital (STVA). This development allows for a more integrated view of intellectual capital. For the purposes of the present analysis, intellectual capital has been measured utilizing the "Ev-VAIC" perspective. The incorporation of VAPY and VAFI into the current study offered a novel contribution by enhancing the original VAIC in ascertaining the roles of physical and financial capital in value creation. The overall framework structure is illustrated in Figure 2.1

Figure 2.1
The Ev-VAIC and Relevant Components



Note. Adapted from the Ev-VAIC and referring to the foundational works of Stewart (2001), Pulic (2000), Andriessen (2001), Van & Wachowicz (2008), and Anoraga (2008).

Figure 2.1 demonstrates the Ev-VAIC as a comprehensive framework for assessing the efficiency of IC in value creation. The framework integrates both tangible and intangible resources by combining two major categories, namely capital employed and intellectual

value. The capital employed dimension comprises two primary elements, namely physical capital (PY) and financial capital (FI). Both elements represent the tangible resources utilised by the enterprise to generate VA. The efficiency of corporate resources is captured through two primary components, namely VAPY as a metric to assess the corporate capacity to create value from physical assets (VA/PY) and VAFI as a metric that reflects the contribution of financial resources to value creation (VA/FI).

The intellectual value dimension consists of HC and structural capital (SC), which reflects the organisational intangible knowledge base. The efficiency of the system is emblematised by VAHU, which is a metric utilised to assess the productivity of human capital in generating value (VA/HC). The STVA is employed to evaluate the efficiency of structural capital by subtracting human capital from VA, adding intangible assets (x), and dividing by the VA result [(VA − HC) + x)/VA]. Subsequently, the four efficiency components, namely VAPY, VAFI, VAHU, and STVA, are aggregated to form the Ev-VAIC index, which symbolises the overall efficiency of value creation through both tangible and intangible assets. The Ev-VAIC does not scrutinise the stock of IC but rather the value generated through effective resource usage within a knowledge-based organisation.

2.2.2 Return on Asset

The Return on Asset (ROA) was employed in the present study as an indicator of financial performance to indicate how efficiently a company utilised total assets to generate earnings. The measure establishes a direct association between resource utilisation and financial outcomes as a profitability ratio, which captures both operational effectiveness and financial strength. Thus, ROA is a more precise and practical measure compared to the broader term “business performance”, which is more difficult to quantify in empirical research due to vagueness.

Brigham and Houston (2003) also argued that profitability is the net result of a series of policies and managerial decisions, which render ROA a key measure of overall corporate effectiveness. Additionally, ROA is considered the most comprehensive measure among various financial indicators owing to the direct linkage with the corporate asset base. Van Horne and Wachowicz (2008) defined ROA as the ratio of net income to total assets as follows:

$$\boldsymbol{ROA = \frac{Earning\ after\ interest\ \&\ Tax}{Total\ Assets}}$$

Fabozzi and Pamela (2003) highlighted ROA as a measure of asset productivity, which employs net income or operating earnings while excluding the influences of interest and taxation. Utilising ROA as an indicator of financial performance in the present study was also consistent with previous empirical studies on IC (Pulic, 2000; Chen et al., 2005; Firer & Williams, 2003). Particularly, a clearer operational definition of financial performance could be provided, which maintained comparability with existing literature and emphasised the role of IC in improving the corporate ability to create sustained profitability from existing assets. In addition, ROA was deliberately selected in this study to avoid the distortions that might arise from other financial indicators. While other measures, such as return on equity (ROE) and net interest margin (NIM), have been widely utilised in financial analysis, the measures are either highly sensitive to financial leverage or limited to specific industries, including banking. Conversely, ROA broadly reflects the corporate capability to generate profits from total resources, which underscores versatility and applicability across different sectors. The characteristics further strengthen the reliability of ROA as a financial performance indicator in the context of IC.

The extensive adoption of ROA in prior studies underscored its reliability as a measure of financial performance. Pulic (2000) introduced the VAIC model and employed

ROA as a key outcome measure. Subsequent academicians, including Chen et al. (2005) and Firer and Williams (2003), also employed ROA. Similarly, the current study ensured methodological comparability with previous research by utilising ROA, which could elevate the validity of the findings and enable meaningful cross-study analysis. Summarily, ROA was selected due to being a holistic and quantifiable measure of financial performance empirically validated in established literature on IC. The ROA concentrates on asset efficiency, excludes financial structure and taxation impacts, and demonstrates high acceptance in existing empirical research.

2.2.3 Market Value

The Market Value (MV) was estimated through the volume-weighted average price (VWAP), which was considered more appropriate in the context of the IDX for financial performance measurement in the present investigation. Specifically, the VWAP captures the average trading price of a corporate stock weighted by transaction volume. The measure integrates both price formation and liquidity into a single indicator. The VWAP also functions as a dynamic indicator of investor sentiment by accounting for actual trading activities throughout the day, compared to market capitalisation, which only reflects the total value of outstanding shares at a specific price. The measure is highly pivotal to emerging markets, including the IDX, where significant fluctuations in trading volume and price volatility can distort market value representation.

Jogiyanto (2000) explicated that MV is fundamentally the stock price determined by the trading exchange within a specific period. The value is shaped by the interaction of market demand and supply, with the number of orders and offers profoundly influencing price formation. The MV reflects not only the nominal price of a share but also the trading

dynamics that underpin investor behaviour. Therefore, MV denotes a price discovery mechanism that responds to ongoing transactions on the stock exchange.

Similarly, Anoraga (2008) underlined that market value (MV) is one of the most identifiable prices by reflecting the actual stock price in an active or even closed market. According to the principles of the primary market, MV indicates the actual corporate condition perceived by investors through stock trading. Hence, MV is a price that symbolises the collective market judgement in a specific period, which highlights the transparency in appraising the corporate value to market participants. The MV also reflects the corporate status in terms of stock prices based on investor perceptions:

$$\boldsymbol{MV = \frac{\Sigma(\,Closing\ stock\ price\ X\ Transaction\ volume)}{\Sigma Transaction\ Volume}}$$

Basir and Fakhruddin (2005) explicated that the price of a share can significantly fluctuate within a short period, with changes potentially occurring within minutes or even seconds. Several terms in stock trading are commonly utilised to describe price movements. The closing price is the last price at which a stock traded on the previous trading day, whereas the opening price is the first transaction price when the market opens, typically at 09:30 in the first session. The highest price indicates the maximum price achieved by a stock during the trading day, while the lowest price denotes the minimum price at which the stock is traded on the same day. Collectively, the terms elucidate the trends of stock price fluctuations and provide essential benchmarks for market participants when assessing daily trading activities. Previous researchers also employed the VWAP as a market-based proxy for firm value, as the measure could more realistically capture stock price dynamics by incorporating both price levels and trading volumes.

Moreover, the VWAP is widely recognised in finance literature as a benchmark for reflecting price discovery quality and trading efficiency (Konishi & Makimoto, 2001). The

measure is particularly relevant in emerging capital markets, where fluctuations in trading activity and liquidity can substantially impact investor perceptions of firm value. Utilising the VWAP as a proxy is consistent with the notion that market value can be scrutinised via various indicators other than conventional market capitalisation, depending on the research context (Nimtrakoon, 2015; Odat, 2022). Thus, adopting the VWAP enabled the current study to pinpoint trading dynamics within the IDX through a market-based measure that could more accurately reflect investor sentiment and actual market behaviour.

In Indonesian capital market research, market value (proxy by VWAP) is employed as a substantive, volume weighted market price measure rather than merely an execution benchmark. At the strategy level, Fahros, Rahman, and Sirait (2025) incorporate this VWAP-based measure into the Relative Vigor Index within an automated MT5 Expert Advisor; back-tests are promising, while a short live window highlights volatility and parameter sensitivity, indicating the need for sound optimisation and risk management. Sakir (2018) codifies market value (VWAP) in trading-performance and information-advantage metrics, for IDX equities, illustrating how a volume-weighted average price is an explicit analytical variable for investor behaviour modelling and trade outcome. Ervina and Rachman (2019) add to these sentiments, investigating liquidity around BEI tick-size/price-group reforms and incorporating market value (VWAP) into their measurement framework, solidifying its role as a transaction-weighted benchmark for Indonesian equities. Taken together, these studies confirm the application of market value (as proxy by VWAP) as a market derived price measure in Indonesia when the objective is to portray price making weighted by the actual volume transacted.

Therefore, the employing of VWAP as a market based price proxy for market value (MV) in the current study was a deliberate choice to guarantee that the measurement could

accurately reflect the actual trading dynamics of IDX-listed firms. The approach allowed a more accurate representation of market perceptions and aligned with the research objective of exploring the interplay between IC and firm value in the Indonesian capital market. Summarily, operational definitions in the present study established a structured measurement framework, which ensured that each variable, especially those derived from the Ev-VAIC, was conceptually clear, quantifiable, and aligned with the research objective. The following definitions elucidate the methodology of measuring IC and pertinent components, in conjunction with the indicators of return on asset (ROA) and market value (MV) as the dependent variables. Collectively, the elements served as the empirical foundation for the current framework specification and hypothesis development, which will be elaborated in Chapter 3.

2.3 Theoretical Foundation

The influence of IC on financial performance (return on asset and market value) can be thoroughly explicated through theoretical frameworks that consider internal capabilities and external perceptions. Accordingly, the present study adopted two complementary perspectives, namely the resource-based view (RBV) and signalling theory. Both theories provided an integrated explanation of how intangible resources, including intellectual capital (IC), could contribute to operating outcomes and investor decision-making processes. The current study reviewed relevant approaches to evaluating intellectual capital (IC) to effectively translate both theoretical perspectives into an empirical analysis. VAIC model as the conceptual foundation, and Ev-VAIC is adopted as the operational proxy.

2.3.1 Resource-Based View

The Resource-Based View (RBV), which was introduced by Wernerfelt (seminar formulation) and substantial updates were made to the concept of value-creation logic and the scope of research agendas was expanded (Barney, 2021; Barney, Ketchen, & Wright, 2021; Cooper et al., 2023). Barney (2001) contended that the RBV remains highly relevant in dynamic and knowledge-driven business environments, particularly when explicating how intangible assets, such as intellectual capital (IC), can generate sustained competitive edges. Modern RBV research has also emphasised the importance of Valuable, Rare, Inimitable, and Non-substitutable or VRIN resources to produce long-term performance benefits (Newbert, 2007). The actual value of intellectual capital (IC) is contingent upon the coherence with and complementarity to organisational processes and capabilities among knowledge-intensive firms (Barney, 2001). The current study investigated intellectual capital (IC) via the Ev-VAIC as a strategic intangible asset that could directly influence internal operating outcomes, especially return on asset (ROA). The current findings could offer robust empirical evidence for H1, which postulated a positive correlation between intellectual capital (IC) and financial performance. Concurrently, the signalling theory posits that enterprises with stronger IC are more recognised by investors, which leads to higher market value (MV). Accordingly, H2 proposed a positive linkage between intellectual capital (IC) and market value (MV). Collectively, both the RBV and signalling theory functioned as a robust theoretical foundation for comprehending how strategically aligned intellectual capital (IC) could effectively contribute to superior corporate performance and long-term competitive edges.

2.3.2 Signalling Theory

The theory, which originated in economics before being applied to corporate finance and management, describes how firms convey information about corporate quality to external stakeholders when direct observation is infeasible (Spence, 2002; Connelly et al., 2011). Relevant corporate signals should be observable, costly to imitate, and credible in representing corporate attributes (Connelly et al., 2011). Particularly, intellectual capital (IC) represents an unobservable resource, with corresponding influences inferred through performance indicators. Profitability ratios, such as return on asset (ROA), serve as reliable indicators of intellectual capital (IC) deployment by indicating efficiency in employing corporate resources, which can be verified through audited accounts (Connelly et al., 2011; Tan et, al., 2007; and Firer & Williams, 2003). The theory was also directly relevant to H2, which propounded that intellectual capital (IC) positively impacts market value (MV). Accordingly, the signalling theory postulates that investors utilise observable indicators, such as financial performance and firm disclosures, to interpret the strength of intellectual capital (IC) due to the intangible nature of intellectual capital (IC). The theory also underscores the role of intellectual capital (IC) in shaping investor perceptions and amplifying firm valuation.

2.3.3 Measuring Intellectual Capital

The measurement of IC has become a key focus in academic research and business practice to corroborate the contribution of intangible resources to organisational performance and value creation. Compared to traditional financial indicators, IC captures the efficiency with which knowledge-based assets, such as human, structural, and customer capital, drive firm success. The widely adopted model is the Value Added Intellectual Coefficient (VAIC) introduced by Pulic (2000) due to the conceptual clarity, simplicity, and

reliance on audited financial statements. The VAIC assesses IC efficiency through three primary components, namely Value Added Capital Employed (VACE), VAHU, and STVA. The model is also suitable for large-sample studies and cross-country comparisons, owing to high objectivity and replicability.

Hence, the VAIC has been extensively employed in both developed and emerging markets (Chan, 2009; Clarke et al., 2011; Maditinos et al., 2011). While the VAIC has been complimented for high practicality and replicability, several concerns have been conveyed regarding the ability to fully capture the multidimensional nature of IC. Table 2.2 illustrates contrasting perspectives systematically by summarising the primary strengths and weaknesses of VAIC reported in the existing literature. The tabular presentation provides a concise overview that complements the discussion and offers higher clarity regarding the value and limitations of the VAIC as a measurement model for IC.

Table 2.2
The Strengths and Weaknesses of the VAIC

Aspect	Strength	Weakness
Data Basis	Utilising audited accounting data → objective and replicable (Chan, 2009; Clarke et al., 2011)	Highly accounting-based, which under-captures innovation and relational capital (Stahle et al., 2011)
Applicability	Practical for large samples and cross-country studies	Measuring efficiency and not the stock of IC (Andreeva & Garanina, 2016)
Adoption	Widely applied in developed and emerging markets (Maditinos et al., 2011)	Less effective in knowledge-intensive industries

Note. Pulic (2000), Chan (2009), Clarke et al. (2011), Maditinos et al. (2011), Ståhle et al. (2011), and Andreeva and Garanina (2016)

The VAIC is recognised for high reliance on audited accounting data, which ensures objectivity and comparability. The model is also acknowledged for high simplicity and practicality in large-scale and cross-country applications, which has led to widespread adoption (Chan, 2009; Clarke et al., 2011; Maditinos et al., 2011). Nevertheless, the VAIC has also been criticised for high dependence on accounting data, which frequently underrepresents innovation, relational capital, and other dynamic IC aspects. In addition, the model has been criticised for solely focusing on efficiency rather than the stock of intangible assets, which limits the explanatory power in knowledge-intensive contexts (Ståhle et al., 2011; Andreeva & Garanina, 2016). Therefore, the current study adopted the Ev-VAIC (Batubara et al., 2021a, 2021b) as an operational proxy due to its being a more holistic and updated measurement framework.

2.3.3.1 Value Added Intellectual Coefficient

The Value Added Intellectual Coefficient (VAIC), which was developed by Pulic (2000), is a systematic framework for evaluating the efficiency of firms in utilising corporate resources to generate value. The model conceptualises organisations as value-creating entities, with success determined not only by tangible resources but also by the capability to generate sustainable performance through IC mobilisation (Tan et al., 2007). The VAIC is also highly instrumental owing to the capability to convert the abstract concept of IC into measurable indicators, which enables applications in various industries and countries. The model comprises three primary components.

The first component is VACE, which evaluates the efficiency of physical and financial capital in producing value. The VACE is calculated as the ratio of VA to capital employed (CE). A higher VACE value indicates that a firm can deploy existing financial and physical resources more effectively to generate economic returns. Therefore, the

indicator highlights the importance of optimising existing assets to sustain firm competitiveness.

The second component is VAHU, which appraises the contribution of HC to value creation. The VAHU is computed as the ratio of VA to HC expenditure (VA/HC), which indicates the extent to which investments in employees, such as salaries, training and development, are converted into organisational outputs. A higher VAHU value suggests that the current workforce is a valuable strategic asset capable of converting knowledge, skills, and competencies into tangible value, rather than functioning as a cost factor.

The third component is SCVA, which emblematises the residual value remaining after accounting for HC. The component is estimated as the ratio of SC to VA (SC/VA). A higher STVA value indicates that organisational infrastructure, processes, culture, and intellectual property can effectively support value creation. Particularly, STVA highlights the institutionalised knowledge embedded within an organisation that remains even when employees depart from the organisation.

Collectively, the three components are aggregated into the overall VAIC formula (VAIC = VACA + VAHU + STVA). The aggregated score reflects intellectual efficiency and business performance in terms of how the overall intellectual capacity of a corporation can generate wealth from available corporate resources. One of the key strengths is the reliance on audited financial statements, which ensures objectivity, replicability, and comparability across firms and industries (Clarke et al., 2011). The methodological simplicity also renders the model highly suitable for large-sample studies and international comparisons, which have contributed to widespread adoption across both developed and developing nations (Maditinos et al., 2011). While the VAIC has been extensively recognised for high simplicity, objectivity, and suitability for financial research, the

dependence on financial statement data underscores the inability to capture the broader and more dynamic dimensions of IC. Existing scholars have developed expanded models to provide a more comprehensive assessment of how intellectual resources contribute to firm value and market performance.

2.3.3.2 Expansions of the IC Measurement

Existing researchers have proposed expanded approaches beyond the VAIC to resolve existing limitations and capture a broader spectrum of intellectual resources. The developments are based on the theoretical insights of Stewart (2001), Andriessen (2001, 2003, 2004), and Pulic (2000) to offer a more holistic perspective on IC. Specifically, the present study proposed an alternative measurement model that categorised IC into four primary components, namely physical, financial, human, and structural capital.

Stewart (2001) defined IC as material of an intellectual nature, such as knowledge, information, intellectual property, and experience, which can be mobilised to create wealth. Stewart (2001) also pinpointed two primary categories of intangible assets, namely organisational capital (SC and customer capital) and HC. Specifically, IC encompasses the resources, capabilities and competencies that underpin organisational performance and long-term value creation (Marr & Roos, 2005). Customer capital refers to external relationships and knowledge dissemination between an organisation and stakeholders, whereas SC includes governance structures, organisational culture, processes, intellectual property, and technological systems. Meanwhile, HC symbolises employees' accumulated skills, expertise, and engagement. Stewart (2001b) further contended that knowledge qualifies as IC only when knowledge directly contributes to wealth creation, which distinguishes knowledge from raw data or information without productive application.

Andriessen and Tissen (2000) initiated a systematic classification of intangible assets and emphasised the role of intangible assets in shaping the IC of a firm. The study demonstrated five broad categories of intangible resources, namely (a) tacit skills and knowledge, (b) collective values and norms, (c) explicit knowledge and technology, (d) primary and management processes, and (e) endowments. The classification highlighted that IC was not a homogeneous concept but rather encompassed numerous organisational attributes, which ranged from individual competencies to institutionalised practices and cultural values. Simultaneously, the framework revealed that intangible resources constituted a critical foundation for sustainable competitive advantages and should be integrated into strategic management.

Subsequently, Andriessen (2001) refined IC conceptualisation by outlining four key characteristics that distinguished IC from traditional assets. Particularly, intellectual skills and explicit knowledge are integral to organisational success. Corporate capital should be perceived in two primary forms, namely HC and SC. Moreover, the distinction between tangible and intangible resources should be discerned, as IC cannot be evaluated through the same logic applied to physical assets. Relevant IC indicators should also function as measures of both stocks and flows, which allows for tracking the highest and lowest levels of knowledge utilisation within a firm. Collectively, the insights have positioned IC as a dynamic construct that not only exists in accumulated form but also circulates through organisational processes to shape long-term performance.

Andriessen (2003, 2004) shifted the focus towards the methodological and evaluative aspects of IC. Specifically, any meaningful valuation of IC requires three essential elements, namely a clearly defined object of measurement, a robust estimation framework, and explicit usefulness or desirability criteria. Andriessen (2003, 2004) proposed several measurement

techniques, including financial valuation methods, value measurement approaches, value assessment tools, and broader measurement frameworks. Notably, Andriessen (2003, 2004) acknowledged the limitations of solely qualitative assessments and advocated for model development based on quantitative data. Relevant research by Andriessen (2003, 2004) also demonstrated that the VAIC model could produce significant advantages owing to the reliance on financial information available in conventional corporate reports. Therefore, the VAIC facilitates objective comparisons across firms and industries by reducing subjective judgment and employing standardised indicators, which renders the VAIC a practical tool for scholars and practitioners in financial research.

Pulic (2000, 2000b) contributed to the ongoing discourse by refining the VA concept as a key indicator of economic performance. Particularly, VA is regarded as the most accurate measure of the corporate ability to generate wealth and the most objective outcome of business activities. The VA was defined as the difference between outputs (revenue from products and services) and inputs (the expenses required to generate products and services). Meanwhile, labour costs were excluded from inputs as employees would contribute intellectual potential rather than being passive expenses. Thus, VA captures the wealth created during a specific period and underscores the significance of shifting the focus of management from controlling costs to creating value in knowledge-driven economies. Summarily, relevant developments have demonstrated how IC measurement has evolved beyond the original VAIC.

Integrating the perspectives of Stewart (2001), Pulic (2000) and Andriessen (2001, 2003, 2004) has expanded the framework to provide more holistic evaluation through the inclusion of financial, human, structural, and customer dimensions. Stewart (2001) emphasised the wealth-creating potential of knowledge, human talent, and organisational

systems, whereas Pulic (2000) developed a quantifiable model, namely the VAIC, according to the VA framework. Andriessen (2001, 2003, 2004) highlighted the multidimensional nature of IC and the need for rigorous valuation frameworks. The convergence of the perspectives has inspired the development of more refined models, such as the Ev-VAIC by Batubara et al. (2021b), through the incorporation of broader IC components. Resultantly, richer insights into how IC drives sustainable value creation and firm performance have been garnered.

2.4 Empirical Studies

Extensive empirical studies on IC have been conducted across various contexts, which reflect global and country-specific perspectives. International research has generally concentrated on developed and emerging markets and offered insights into the diverse methods IC influences financial performance and MV. Simultaneously, an increasing number of studies have examined the Indonesian context, with the distinctive institutional and market environment serving as a critical setting to explore the relevance of IC. Accordingly, the current section delineates international research and Indonesian studies.

2.4.1 Empirical Studies of the Role of IC

Considerable empirical research has been performed worldwide to determine the role of IC in shaping corporate financial performance and market value. Relevant studies, which have been conducted in both developed and emerging economies, have contributed valuable insights to how IC is conceptualised, measured, and linked to financial and market-based outcomes. The current study also reviewed international empirical evidence to establish a broader foundation for comparison and underline how findings from other countries might inform the Indonesian context.

Low (2000) emphasised the key role of non-financial intangibles, including IC, in ascertaining firm performance. Low (2000) identified that innovation, brand reputation, and employee skills were essential to companies that invested in and developed primary intangible assets in boosting market value. The findings posited a causal relationship between accumulating IC and higher corporate recognition and appreciation in the marketplace. Hence, intangible assets serve as the key drivers of the competitive advantage owned by a corporation in knowledge-intensive sectors, such as financial and banking.

Reed (2000) assessed the connection between IC and firm performance in the banking industry to determine how knowledge-based assets were engaged in overall firm success. The results indicated that IC was a significant predictor of firm performance, which demonstrated that banks with more effective IC, including highly advanced HC, robust SC, and effective relational capital, consistently outperformed other institutions. The results suggested that effective intangible asset management would be critical to achieving financial and operational success.

Riahi-Belkaoui (2003) also explored the role of IC in contributing to the financial performance of multinational enterprises in the United States (US). Accordingly, IC, which comprised HC, organisational knowledge, and other intangible assets, was discovered to be a key determinant of corporate competitive advantages in the context of a globalised economy. The study employed econometric models to estimate the impact of IC on financial performance indicators, such as ROE and ROA, through a large dataset of US-based multinational firms. Specifically, a significant positive relationship was revealed between IC and financial performance, wherein firms with higher IC achieved superior financial performance. Knowledge-intensive resources, organisational processes, and managerial knowledge contributed more to profitability and efficiency compared to traditional and

tangible assets. The findings underscored the significance of strategic IC management, especially for multinational corporations competing in intricate and competitive global markets.

Firer and Stainbank (2003) empirically examined the role of IC in the business performance of the South African economy. The results uncovered a negative correlation, which postulated that larger investments or a stronger focus on IC did not result in improved profitability, productivity, or financial performance among South African businesses. Furthermore, the study affirmed that IC exerted minimal or no influence on primary external stakeholders, including investors and analysts. Analysts and investors did not seemingly factor IC into firm value calculations and were influenced by the IC performance of a firm during market valuations. The negative results propounded inadequacies in the management, measurement, or disclosure of IC among South African corporations.

Chen, Cheng and Hwang et al. (2005) appraised the association between MV and IC among publicly traded firms listed in the Taiwan Stock Exchange to corroborate whether the intangible assets of a company, including HC, SC, and organisational expertise, would influence capital market valuation. The study employed statistical models to quantify IC and pertinent components and discovered that higher IC levels were significantly and positively associated with increased MV. The results indicated that companies that could effectively utilise IC would receive more positive perceptions from investors. Therefore, IC functions as a strategic resource rather than a source of internal functional competence, which determines the external valuation of a company within the market.

Tseng and Goo (2005) analysed the impact of IC on the MV of Taiwanese manufacturing firms. Particularly, the VAIC was applied to scrutinise the efficiency of IC components, namely HC, SC, and CE, in value creation. The findings demonstrated a

statistically significant and positive relationship between IC performance and market valuation. Corporations with higher IC performance through the capacity to govern the current workforce, organisational routines, and resource allocation demonstrated higher potential in attaining higher market valuations. The results validated that investors in the Taiwanese manufacturing sector emphasised intangible assets more as strategic elements. Companies that could maximise IC can be rewarded not only operationally but also through the increased faith and valuation of the market. Thus, IC serves as a primary source of firm value in a knowledge economy, particularly in industries where innovation and intangible assets are imperative for long-term growth and competitiveness.

Wang and Chang (2005) performed a thorough analysis of IC and pertinent implications for firm performance through the Taiwan Electrical Journal (TEJ), which functioned as a valuable source of information to the globally renowned Taiwanese IT industry. The purpose was to understand the interaction among IC factors, which comprised HC, customer capital, innovation capital, and process capital, and financial performance in a knowledge-intensive sector, where intangible assets were pivotal to corporate success. The results indicated a statistically significant positive correlation between IC and financial performance, which highlighted the importance of intellectual assets to corporate profitability and growth. The study also demonstrated a more intricate association with HC. While HC was not directly associated with financial performance, HC was indirectly correlated to three of the largest IC components, namely customer capital, innovation capital, and process capital. The findings propounded that HC contributed to firm performance by influencing the organisational ability to establish customer relationships, drive innovation, and optimise internal processes.

Tan et al. (2007) evaluated IC and its impact on the financial performance of Singaporean companies via the annual reports published by the Singapore Stock Exchange from 2000 to 2002. The VAIC was utilised to measure IC and financial performance in terms of ROE, earnings per share, and annual stock returns. The findings revealed that financial performance was positively correlated with IC. Additionally, the impact of IC on financial performance significantly varied based on the annual growth rate of IC.

Yalama and Coskun (2007) also conducted a diligent empirical test to assess the degree to which IC contributed to the financial performance of banks listed in the Istanbul Stock Exchange between 1995 and 2004. A quantitative method, namely data envelopment analysis (DEA), was employed to appraise the efficiency of decision-making units by separating the relative influence of IC on bank performance from physical capital. The findings indicated that IC produced a higher impact on bank performance compared to physical capital by generating higher average returns and aggregate value. Hence, banks that could effectively acquire and manage intangible assets, such as employee knowledge and skills, organisational expertise, and relational contacts, could produce superior financial outcomes compared to banks primarily relying on tangible assets. The study highlighted a paradigm shift in the banking industry, wherein strategic IC management became increasingly vital to maintaining competitive edges and elevating MV.

Kamath (2008) conducted a longitudinal study on the influence of IC on firm performance among the top 25 listed Indian firms in the pharmaceutical sector from 1996 to 2006. The study applied the VAIC model to scrutinise the effectiveness of the firms in employing intangible and tangible assets for profitability, productivity, and market capitalisation. The results demonstrated that the aggregate VAIC scores produced minimal influence on performance measures, including ROA, asset turnover, and market

capitalisation. Nonetheless, HC efficiency (HCE) was discovered to positively and significantly impact profitability when VAIC components were isolated. The results postulated that employees' knowledge, abilities, and skills were crucial to driving performance in research and development-oriented industries, such as the pharmaceutical sector.

Wang (2008) empirically investigated the impact of IC on MV in the US electronics industry. The investigation focused on publicly traded companies in the Standard and Poor's index from 1996 to 2005. The analysis of financial and IC data revealed that IC was significantly and positively associated with MV. The findings posited that companies, which efficiently leveraged HC, SC, and other capital resources, were more recognised by the market. The findings also corroborated that intangible assets in knowledge-intensive industries were increasingly acknowledged as the fundamental drivers of firm value.

In addition, Bontis et al. (2010) empirically analysed the pharmaceutical sector in Jordan to ascertain the impact of IC on business performance. The study confirmed the profound and favourable influence of IC, which consisted of HC, SC, and relational capital, on business performance by analysing survey data from managers and applying structural equation modelling (SEM). The results suggested that IC was a key driver of innovation, competitiveness, and long-term organisational success in a developing economy, such as Jordan. The findings also reinforced the notion that investing in knowledge-based resources could substantially improve business outcomes, especially in knowledge-intensive industries.

Chu et al. (2011) examined listed companies in Hong Kong and evaluated the efficiency of IC and the relationship with firm performance through the VAIC. Business performance was assessed through market-to-book value, ROA, and asset turnover. The

results indicated an insignificant linkage between IC and firm performance indicators, which suggested the potential limitations of the VAIC in capturing the broader contributions of IC in advanced markets, where intangible assets and innovation might not be sufficiently represented in accounting-based measures.

Maditinos et al. (2011) also investigated the influence of IC and relevant components on firm performance and MV through a sample of 96 companies listed on the Athens Stock Exchange (ASE). The study concentrated on four different economic sectors and employed Pulic's (2000) VAIC as the measurement framework. The results revealed that only HCE was significantly and positively correlated to firm performance, whereas SC efficiency and CE efficiency exhibited opposite findings. Notably, overall IC did not produce a significant impact on financial or business performance among banks listed on the Milan Stock Exchange. The findings propounded that the contribution of IC to value creation might vary across sectors and countries, which underscored the importance of contextual factors, including industrial dynamics and market maturity. The results also emphasised the vital role of HC in fostering organisational success, especially in sectors where knowledge and skills were paramount to competitiveness. Only SC or physical capital would be insufficient for enhancing corporate performance.

Clarke et al. (2011) comprehensively evaluated Australian companies to identify the efficiency of IC and the association with financial performance between 2003 and 2008. The study assessed financial outcomes through indicators, such as ROA, ROE, revenue growth, and employee productivity, by analysing annual report data and applying the VAIC. The findings uncovered positive associations between financial performance and physical capital and between financial performance and HCE. Physical capital was discovered to be the most significant factor in contributing to corporate outcomes, which postulated that tangible

resources continued to play a stronger role compared to knowledge-based assets in driving profitability and productivity in the Australian context. The results suggested that reliance on physical capital remained a key determinant of corporate performance in developed economies, such as Australia, despite the relevance of IC.

Meanwhile, Rehman et al. (2011) scrutinised IC in the Pakistani Modaraba sector, which was a non-traditional financial service industry. The VAIC was utilised to explore the impact of HCE, structural capital efficiency (SCE) and capital employed efficiency (CEE) on financial performance indicators, such as ROA and ROE. The findings demonstrated that all three IC components were positively and significantly correlated with financial performance, with HCE exerting the highest influence. The results highlighted the importance of employee skills, knowledge, and competencies in creating value within organisations. Notably, IC functions as a crucial driver of competitiveness and profitability even in specialised financial institutions beyond the conventional banking framework.

Kamal et al. (2012) conducted a large-scale study to appraise the impact of IC components on the financial performance of Malaysian commercial banks through public financial data. The VAIC was applied to measure the capability of physical capital, HC, and SC to boost banking performance metrics, namely ROA and ROE. The results demonstrated a positive correlation between physical capital efficiency (PCE) and financial performance, which indicated that banks efficiently utilising physical assets, including equipment, facilities, and other tangible assets, would be more profitable and yield higher returns. Contrarily, HCE was negatively correlated to financial performance and exhibited a counterintuitive relationship. The finding posited that an increase in HCE did not constantly lead to improvement in ROA or ROE, potentially due to the ineffective evolution of HC

management practices or limited applications of employees' skills, experience, and knowledge to guide financial performance.

Kamath (2015) assessed the interplay among IC, profitability (ROA), productivity (ATO), market value (MV), and growth in sales revenue and income (GS), with control variables consisting of the firm size (MCAP), ROE, and leverage, among 30 firms across different sectors, including banking, pharmaceutical, and automobile. Kamath (2015) listed and selected the firms from the S&P BSE SENSEX index or Bombay Stock Exchange Sensitive Index in 2014. The empirical observation was conducted for the financial year 2008/2009 to 2012/2013. The results uncovered that the CEE of the IC components significantly influenced MV. Simultaneously, HCE and SCE produced profound impacts on ROA. Meanwhile, no significant influence was observed from the firm size on any aspect of financial performance and MV. Leverage only influenced profitability but did not exhibit a significant influence on productivity and MV. Similarly, control variables did not impact sales growth.

Nimtrakoon (2015) also examined the impact of IC on MV and financial performance among publicly listed firms in ASEAN countries. The study employed the VAIC, two accounting-based measures, namely ROA and ROE, and market-based measures, including market-to-book value and market value of equity. The results highlighted that IC significantly influenced the MV of a firm, although the strength of the influence varied between countries. The findings suggested that investors in ASEAN capital markets recognised the strategic importance of IC in enhancing firm valuation.

Fahimi (2017) conducted a detailed examination of the association between IC and market share through the data collected from 99 companies listed on the Tehran Stock Exchange from 2011 to 2015. The VAIC (Pulic, 2000) was applied to appraise IC

performance among the selected companies. The findings indicated a significant positive correlation between IC and market share, in which firms that could manage IC more effectively could capture a larger market share. Nevertheless, no evidence was revealed to support financial performance as the mediator, wherein the impact of IC on market share would not be delayed by and did not depend on financial performance improvement. Therefore, intangible assets, such as employee knowledge, structural processes, and knowledge-based assets, would produce an independent and measurable influence on the competitive position of a corporation in the market. The IC functions as a strategic asset capable of directly influencing market results, regardless of financial performance levels.

Anifowose et al. (2017) appraised the relationship between IC disclosure and MV among corporations listed in the Nigerian Stock Exchange. The study focused on two key dimensions of MV, namely cost of capital and market capitalisation, while exploring the moderating role of religion and ethnicity in shaping relevant relationships. Anifowose et al. (2017) performed regression analysis for hypothesis testing through panel data from annual reports between the financial years 2010 and 2014. The results revealed a significant positive association between IC disclosure and market capitalisation, which suggested that higher transparency in reporting IC could enhance investor confidence and firm value. Conversely, IC disclosure was demonstrated to negatively influence the cost of capital, which suggested that enterprises with higher levels of disclosure could reduce financing costs. The findings supported the study hypotheses and emphasised the significance of IC reporting as a communication tool with stakeholders and as a means of improving MV and lowering financing barriers, particularly in emerging economies, such as Nigeria.

Shubita (2019) explored the influence of IC on the MV of Jordanian industrial firms from 2005 to 2017. The IC and relevant components (CE, SC, and HC) were measured via

the VAIC and the market capitalisation over the total assets was employed to assess MV. The results demonstrated an insignificant linkage between IC and MV. While HC was associated with MV, SC and CE were not.

Xu and Liu (2021) conducted a comprehensive study to investigate the impact of intellectual capital (IC) on the financial performance of manufacturing companies listed in China. The research aimed to analyse the effectiveness of various constituent parts of intellectual capital, especially human capital and physical capital, on financial performances of manufacturing companies as denoted by profitability or return on assets ROA and market value MV. The authors utilized the VAIC framework to determine the effectiveness of intellectual capital as it relates to human capital, structural capital, and physical capital. The findings of the research showed that human capital and physical capital create the most positive force on the finance of manufacturing companies. Human capital shows the knowledge and capabilities of employees in an organization. The research showed that it contributes hugely towards increased profitability. Therefore, it shows that manufacturing companies in China should work on employee training. The research shows that manufacturing companies in China also work on enhancing physical capital such as technology. The research explains that for companies to become financially successful in China, it is vital to maintain strong intellectual capital. The research shows that human capital and physical capital in manufacturing companies create the most positive force towards finance.

Ali, S., Hedvicakova, M., Jiang, J., and Naeem, M. (2022) conducted studies to examine the impact of efficiency in intellectual capital (IC) on the financial performance of listed companies in Pakistan and India during 2010-2020. Utilizing the MVAIC model, the study assessed four most critical elements of IC. It is human capital, structural capital, used

capital, and financial capital through regression analysis with STATA software. The findings showed that IC effectiveness had a positive effect on financial performance, and human capital had the greatest effect. Companies that spent effectively on workers' capabilities and organizational processes demonstrated improved return on assets (ROA) and return on equity (ROE). The study emphasizes the role of human and structural capital in driving financial success, particularly in the developing economies, and advises that companies must focus on developing employees' capabilities and leveraging organizational mechanisms to improve their financial performance.

Odat (2022) also appraised the impact of IC on commercial banking performance in Jordan. The VAIC was utilised to evaluate IC, ROA functioned as the proxy of accounting-based performance, and the market-to-book value ratio (MV/BV) served as the market-based performance indicator. The findings uncovered the positive and significant impact of IC on both ROA and MV/BV, which postulated that IC could elevate internal profitability and strengthen investor confidence. The results reinforced the notion that various market-based indicators could capture how IC would contribute to firm value.

Čupić, Milašinović, and Todorovic (2023) investigated the impact of intellectual capital (IC) on the financial performance of Serbian hotel companies from 2018 to 2022. IC comprises human capital, structural capital, relational capital, and capital employed. The objective of the research was to examine how these IC components influenced financial performance before, during, and after the crisis caused by the pandemic of the Coronavirus. The study established that structural capital, encompassing organisational processes, technology, and systems, exerted the most substantial positive influence on financial performance, particularly during the pandemic. The human capital of the organisation had a positive effect on the EBITDA margin, but a negative effect on EBITDA. This indicates that

while skilled employees can increase profitability, the associated costs can reduce overall earnings. The study found that relational capital, defined as relationships with customers and suppliers, had a positive effect on Return on Assets (ROA), indicating that strong business relationships are essential for effective asset utilisation. The study emphasised that effective management of structural capital and investment in human capital are crucial strategies for hotels to not only survive financial crises but also thrive and enhance long-term financial stability.

Joshi (2024) investigated the interaction between IC and firm performance in emerging markets by concentrating on firms listed in India and employing the VAIC to evaluate IC. A combination of accounting-based measures, such as ROA and ROE, and market-based indicators, including market capitalisation, the MV/BV, and stock price, were utilised. The findings affirmed the positive influence of IC on both financial performance and market valuation, which emphasised that investors perceived IC as the key driver of sustainable firm value creation. The results provided robust empirical evidence that different proxies of MV could be employed depending on the research context.

2.4.2 Empirical Studies of the Role of IC in Indonesia

An increasing number of empirical studies have focused on the Indonesian context. Relevant investigations are pivotal to the unique institutional settings, regulatory frameworks, and market dynamics in Indonesia, in which the impact of IC on firm performance and stock market outcomes may vary. Examining the IDX-listed companies enabled the current study to contribute novel insights pertinent to domestic stakeholders, while concurrently contributing to the broader discourse on IC in emerging markets.

Trisnowati and Fadah (2014) investigated the impact of IC and relevant components on firm MV and financial performance among 21 public banks listed in the IDX between

2009 and 2011. The IC was analysed through VACE, VAHU, and STVA. Firm MV was evaluated in terms of the MV/BV, whereas financial performance was quantified in terms of ROA, ROE, and growth of revenue (GR). Regression analysis demonstrated that overall IC (VAIC) exerted no influence on MV and GR. Comparatively, VACE produced a strong impact on ROE, and STVA significantly influenced all financial performance indicators.

Ulum et al. (2014) evaluated IC performance (ICP) among Indonesian banks through the modified VAIC (MVAIC) by analysing the data from 2009 to 2012. The findings discovered a wide range of MVAIC values for banks, which reflected varying levels of IC efficiency. Notably, three of the four government-owned banks were rated as top performers, which highlighted the significant role of IC in boosting Indonesian banking performance.

Bemby et al. (2015) also assessed the influence of IC on firm value, with the ownership structure as a moderator on bank firms listed on the IDX between 2009 and 2012. Both the VAIC and Tobin's Q (measuring firm value) revealed that IC significantly and favourably impacted firm value. Meanwhile, managerial ownership negatively moderated the relationship, which postulated that higher managerial ownership could reduce the positive impact of IC on firm value.

Prawira and Setiawan (2018) appraised the impact of IC and pertinent components, namely VACE, VAHU, and STVA, on firm performance, which was measured through ROA, ROE, and the MV/BV. A total of 102 manufacturing firms listed in the IDX from 2012 to 2016 were scrutinised. The study uncovered that IC significantly and positively influenced financial performance and MV, with VACE being the most influential component.

Hermawan and Pamungkas (2019) also investigated leading IC-intensive companies listed on the IDX by applying both the VAIC and MVAIC. The findings demonstrated that

IC was positively correlated to fiscal performance metrics, such as ROA and ROE. The results emphasised that IC measurement and management through appropriate and effective policies were instrumental to attaining organisational profitability and operational performance maximisation.

Tarigan et al. (2019) evaluated the impact of IC on financial performance in terms of profitability, productivity, and MV among 93 Indonesian manufacturing firms listed over five years. The study employed Pulic's (2000) VAIC to examine IC. The results revealed that VAIC was significantly associated with financial performance but not MV. Particularly, CEE was highly correlated to both financial performance and MV, whereas HCE and SCE were not.

Moreover, Silviani and Noekent (2020) appraised how IC contributed to financial performance and MV among large trading sub-sector firms listed in the IDX between 2009 and 2018. Partial least squares (PLS) analysis demonstrated that IC was significantly and positively associated with financial performance and MV, which underscored the importance of companies utilising IC to enhance overall firm value.

Soewarno and Tjahjadi (2020) examined the influence of IC on financial performance among Indonesian banking institutions through the VAIC and MVAIC. The study uncovered that IC components, especially HCE, exerted a positive and significant impact on corporate profitability. The findings highlighted that banks, which adequately invested in employee knowledge and skill-based assets, could achieve enhanced financial performance, which underlined the strategic role of IC in influencing financial performance.

Subagyo and Waluyo (2020) also investigated the relationship between the efficiency of IC and the primary components of corporate resources, namely physical capital, HC, and SC, with financial performance (ROA) and market value (MV/BV). The investigation was

conducted among 171 manufacturing firms listed in the IDX from 2014 to 2016. The results demonstrated that physical capital (VACE) was a significant factor influencing both financial performance and MV. The HC (VAHU) contributed to financial performance, while SC (STVA) insignificantly influenced either financial performance or MV.

Batubara et al. (2022) discovered that financial capital exhibited a modest positive association, whereas HC, SC, and physical capital before and during the pandemic demonstrated strong positive linkages. While the tobacco sector suffered a notable decline, the pharmaceutical sector displayed consistency in the IC value. Companies in the food and beverage, cosmetics, and housekeeping sectors were also observed with declines, despite being insignificant. While the COVID-19 pandemic presented a significant obstacle, Indonesian manufacturing firms maintained IC values, which highlighted the importance of intangible asset management in preserving business success throughout the crisis.

Madyan et al. (2022) analysed the impact of IC and pertinent factors on financial performance and firm value among IDX-listed firms across various industries from 2014 to 2018. The IC and relevant components, namely SCE, HCE, and CEE, were measured through the VAIC. Financial performance and firm value were gauged by ROE and the MV/BV, respectively. Both CEE and HCE significantly and positively impacted both MBV and ROE, whereas SCE did not produce a significant influence.

Safira et al (2023) also evaluated the influence of IC, which was quantified by the MVAIC, on the share prices and profitability of technology companies listed on the IDX-TECHNO or IDX Technology Sector Index. The study utilised a quantitative approach with descriptive verification methods and secondary data from financial statements. Particularly, IC significantly contributed to profitability, which subsequently influenced stock prices. Conversely, profitability did not mediate the linkage between IC and stock prices.

Pangestu and Muharam (2023) assessed the impact of IC on the financial performance of Indonesian conventional banks between 2020 and 2023. The adjusted VAIC (A-VAIC), which comprised HCE, innovation capital efficiency (INVCE), and CEE, was applied to analyse the data extracted from the financial statements of 64 banks listed on the IDX. Specifically, IC components significantly influenced financial performance in terms of ROA.

Marbun and Ulpah (2023) also scrutinised the influence of IC on financial and market performance mediated by board function. The study focused on non-financial companies listed in the IDX from 2017 until 2022 through panel regression analysis. The results indicated the significant influence of IC on ROA, with board function amplifying the impact, which posited that optimal governance could boost the benefit of IC on financial performance.

Furthermore, Al-Azizah and Wibowo (2023) investigated the impact of IC on the financial performance of 42 Indonesian banks 42 from 2017 to 2021. The VAIC underscored that IC substantially and favourably influenced financial performance metrics, such as ROA, ROE, and asset turnover (ATO). The results emphasised the importance of effectively managing IC to enhance business performance in the banking sector.

Sulistiani and Ryanto (2024) scrutinised the impact of IC, MV, and earnings per share on stock returns among IDX-listed companies in the financial sector between 2020 and 2022. A quantitative approach involving secondary data and multiple linear regression analysis was employed. The study revealed that neither IC nor MV significantly influenced stock returns. Contrastingly, earnings per share exerted a positive and significant impact on stock returns. The findings underscored the significance of profitability indicators in shaping investor decisions within the Indonesian financial sector and the limited ability of IC and

MV to directly contribute to stock performance. Collectively, the international literature demonstrated that IC was extensively recognised as a key driver of firm performance, although the influence varied depending on the context, industry, and measurement approach. While global studies frequently considered both financial and market-based outcomes, Indonesian studies emphasised profitability or single indicators, which neglected certain aspects. Hence, further research in Indonesia is required to acquire a more comprehensive understanding of how IC interacts with firm value and investor perceptions in an emerging market.

In addition, international evidence also provides also further confirmation of the implementation of a direct-effect model. Chen, Cheng, and Hwang (2005), from their investigation of Taiwanese listed firms, concluded that intellectual capital makes a significant positive contribution to financial performance and market value. Similarly, Firer and Williams (2003), using South African data, established that intellectual capital components, particularly human capital efficiency, directly and positively influence profitability and market valuation. Finally, on the basis of the empirical findings from the research in the Indonesian and International setting supporting the direct-effect model of intellectual capital, which does not consider mediator variables, confirming that IC is a primary driver of firm performance and value creation. This allows for theoretical consistency, empirical relevance, and model simplicity in the study context.

Complementing the finance based VAIC evidence, Indonesian studies have also examined Intellectual Capital Disclosure (ICD) as an informational channel. Most report a direct association between the extent of IC disclosure and firm-relevant outcomes (e.g., market proxies or institutional value), typically without specifying mediators. The next subsection reviews this ICD evidence which there has been some empirical study on the role

of intellectual capital (IC) in explaining financial performance in an Indonesian setting, with most study suggesting a direct association between variables, not employing an intermediating variable. The relevance of this research is significant in relation to this current research setting. The research focuses of listed companies in Indonesia Stock Exchange.

Hatane (2019) analysed the impact of Intellectual Capital Disclosure (ICD) on firm value among a sample of 36 companies from the infrastructure, utility, and transportation industries from 2013 to 2017. The research broke down the variable of interest into human, structural, and relational capital disclosures. The overall level of intellectual capital disclosures was found to positively affect firm value as measured by Tobin's Q. The results of this research show that intellectual capital, as denoted by either the resources themselves or as indicated by the level of intellectual capital disclosures, both contribute directly to an investor's view of organizational value.

Evidence was also provided by Ulum (2019) from a non-corporate setting on how IC transparency can increase institutional value. While the population was derived from higher education institutions, it fits the theoretical concept that IC, an intangible, can directly contribute to value outcomes.

Similarly, Putra et al. (2021) analysed the effect of intellectual capital and its disclosures on firm value within the banking sector of Indonesia from 2015 to 2019. Using the VAIC approach for IC efficiency measurement, as well as an IC Disclosure Index, it was established that IC positively influenced firm value, as did its disclosures. The findings illustrate that those companies with efficient intellectual capital and better reporting practices correspondingly receive higher market valuations. Crucially, it was established that there is a direct relationship from IC to firm value, thus rendering the use of a mediating variable of ESG unnecessary.

Taken together, these studies validate the theoretical propositions of both the Resource-Based View (Barney, 2001) and Signalling Theories (Connelly et al., 2011). According to the Resource-Based View, intellectual capital becomes an intangible resource that is valuable, rare, and impossible to imitate, directly leading to enhanced firm competitiveness or profit gains by virtue of its efficiency and innovation-oriented characteristics. Signalling Theories, on the other hand, argue that IC itself acts as a 'market signal' or indicator of a firm's abilities or growth prospects, which does not require ESG or ICD as an intermediating factor.

2.5 Research Gap

The current literature review has identified two principal gaps, namely a measurement gap and a contextual gap. Both discrepancies reflect the methodological limitations inherent in the VAIC and the paucity of comprehensive evidence available in the Indonesian context. Numerous studies have identified the limitations of the VAIC (Pulic, 2000) despite the extensive application. The limitations encompass the aggregation of physical and financial capital into a single component (VACE) and the inability to capture relational and innovation capital (Nazari & Herremans, 2007; Al-Musali & Ismail, 2016; Xu & Wang, 2018). While the VAIC has continuously served as an instrumental measure, the model remains insufficient in reflecting the diverse and dynamic nature of intellectual capital (IC) in knowledge-based economies. Accordingly, the present study addressed the measurement gap by employing the Evaluation-Value Added Intellectual Coefficient (Ev-VAIC), which separated physical and financial capital to offer a more refined

While a plethora of studies on IC have been conducted in Indonesia, relevant findings remain inconsistent and inconclusive. A potential explanation is the omission of significant

contextual factors, such as corporate governance mechanisms, industry-specific dynamics, and institutional characteristics, which are highly salient in emerging markets. The absence of the variables has potentially diminished the explanatory power of current studies and reduced the applicability to the Indonesian setting. While international studies has frequently evaluated financial and market-based outcomes through standardised methods (Nimtrakoon, 2015; Xu & Wang, 2018; Smriti & Das, 2018), Indonesian scholars have adopted a narrower scope by concentrating on either profitability indicators (ROA or ROE) or market measures (Tobin's Q or market capitalisation). The fragmented approach might have constrained the capability to holistically capture the impact of IC, which simultaneously shapes both internal operating results and external investor perceptions. The current study developed a dual-performance framework to resolve the gap by appraising profitability and market value (MV) concurrently. The approach enabled a more holistic and context-sensitive comprehension of how IC would impact firm performance in emerging markets.

The present study contributed to the existing literature by addressing the measurement gap through the Ev-VAIC as an alternative measurement model of IC, which refined Pulic's (2000) VAIC by distinguishing between financial capital (FI) and physical capital (PY) to increase the accuracy of SC assessment. Simultaneously, the contextual gap was bridged by situating the analysis within the Indonesian market and applying a dual-performance approach, which simultaneously appraised profitability (internal performance) and market value (external performance). The contributions of the current study not only strengthened both methodological and contextual aspects but also introduced a novel framework that captured the multidimensional nature of IC and relevant impacts on firm performance in emerging economies.

2.6 A Remark

This chapter has discussed key theoretical underpinnings, operational definitions, and a broad spectrum of empirical research on intellectual capital (IC), return on asset (ROA), and market value (MV) with global and Indonesian focuses. The discussion has underscored the dynamic nature of intellectual capital (IC) as a strategic resource and its increasing significance in knowledge-based economies. While earlier studies demonstrate variation that is typically positive among intellectual capital (IC) and firm performance, it additionally reveals several key inconsistencies and limitations. The review recognized three fundamental shortfalls in the existing literature. **First**, there was a measurement shortfall where different studies still utilize the conventional VAIC model that sums up tangible assets without taking into account the major elements of intellectual capital like financial and physical resources. **Second**, a contextual imbalance is caused by research carried out in Indonesia, where findings fluctuate considerably and do not necessarily control for moderating factors like governance frameworks or political ties. **Third**, there is a scope deficit insofar as existing studies concentrate on financial performance or market valuation infrequently both thus providing an incomplete picture of the combined influence of intellectual capital. To address these shortcomings, the current research introduces the Evaluation-Value Added Intellectual Coefficient (Ev-VAIC) measurement as a refined evaluative tool that separates physical and financial capital and further incorporates improvements in structural capital. Based on the simultaneous examination of market value and profitability, this study presents a more comprehensive assessment of intellectual capital's influence on organizational success. Further, by focusing on Indonesian companies, this study contributes to placing intellectual capital (IC) research within the setting of an emerging market and enabling the formation of more locally relevant intellectual capital (IC)

management practices. This review of literature forms the foundation for the next chapter, which will outline the research design, the formulation of hypotheses, and the methodological framework utilized to assess the model suggested.

CHAPTER 3

METHODOLOGY

3.1 Introduction

The present study employed an adapted and extended approach derived from Pulic's (2000) VAIC. The modified version, namely Ev-VAIC, broadened the analytical scope beyond the traditional focus on intangible assets. The model integrates both tangible and intangible forms of capital, which encompass physical, financial, human, and structural elements. The inclusion facilitated a more comprehensive evaluation of IC, particularly among manufacturing firms where tangible assets play a critical role in generating value. The current methodological design adopted a quantitative research paradigm and utilised secondary data gathered from audited annual financial reports among firms listed on the IDX. The analysis was based on a balanced panel dataset between 2016 until 2022, which enabled both cross-sectional and time-series analysis of financial performance through ROA and market value (MV). The data were subjected to statistical analysis by employing rigorous econometric methodologies, including descriptive analysis and diagnostic tests, to assess model fit, reliability, and robustness.

The present study adapted a quantitative study design grounded in the positivist paradigm and employed an explanatory strategy to examine the causal relationships among the variables. The current investigation was based on the secondary data derived from audited financial reports and market disclosures of companies listed on the IDX from 2016 to 2022. The analytical approach utilised panel data regression to determine the hypothesised influences of IC through the Ev-VAIC and four components: physical capital (VAPY), financial capital (VAFI), human capital (VAHU), and structural capital (STVA), on financial

performance by using proxy return on asset (ROA) and market value (MV). The current chapter is organised into several key sections to collectively establish the methodological foundation of this study. Specifically, this chapter commences with delineating the prevailing research orientation, which encompasses the philosophical assumptions and the rationales for adopting a quantitative approach. Subsequent sections describe the study population and sampling procedures, data collection methods, and operational definitions of the study variables. The following sections elucidate hypothesis development, model specification, panel data, and diagnostic tests. The present chapter also highlights the statistical tools and diagnostic tests applied to ensure the validity, reliability, and robustness of the results. Furthermore, the present study employed a methodological structure that empirically assessed the hypothesised interactions between IC, financial performance, and market value. A rigorous and credible approach was adopted to guarantee robust analysis presented in the subsequent sections.

3.2 Population and Sampling

The current study population consists of all manufacturing companies listed on the IDX between 2016 until 2022. The period encompassed the most recent septennial period, where audited and standardised financial reports were consistently available. Firms before 2016 were excluded due to inconsistent reporting practices and substandard disclosure standards, and firms after 2022 were not included owing to incomplete or unaudited data. Thus, the dataset maintained comparability, robustness, and methodological reliability for both cross-sectional and longitudinal (panel data) analyses. Moreover, the manufacturing sector was selected as the primary research focus due to its pivotal role in the Indonesian economy and inherently capital intensive nature. Manufacturing firms integrate tangible

resources, including machinery, equipment, and infrastructure, with intangible resources, such as human expertise, organisational processes, and structural systems. The amalgamation renders the sector pertinent for the application of the Ev-VAIC, which adequately considers both tangible and intangible forms of capital. In addition, the sector has historically been a key driver of industrial growth, exports, and employment, which reinforces the significance of IC in enhancing productivity, fostering innovation, and sustaining competitiveness.

Purposive sampling was employed, which aligned with the current ROs and ensured sufficient reliability. The employed methodology was deemed suitable as the current study scope necessitated identifying relevant enterprises that consistently reported both financial and market variables based on IDX disclosure requirements. The inclusion criteria are as follows:

a. The company had been listed on the IDX and completed the IPO no later than 2015 to ensure the availability of annual reports throughout the study period.
b. The annual financial statements from 2016 to 2022 had been published, audited and were complete.
c. All essential financial variables were fully disclosed, including total assets, net income, cost of goods sold, and equity. In addition, market data, such as share prices and trading volume, were accounted for.

Hence, a total of 125 manufacturing firms were selected, which yielded a dataset comprising 875 firm-year observations. The distribution across sub-sectors is as follows:

a. Miscellaneous Industry = 32 companies
b. Consumer Good Industry = 36 companies
c. Basic Industry and Chemicals = 57 companies

The relatively larger share of the sub-sector of basic industry and chemicals indicated the prominent position in IDX listings. While the proportion might have led to a certain degree of overrepresentation, valuable insights were contributed to IC utilisation within capital-intensive industries, which was also pinpointed during the interpretation of the current study results. The dataset was subsequently screened to remove missing values and extreme outliers to guarantee full compliance with panel regression assumptions. Resultantly, the final sample comprised 833 valid firm-year observations, which were deemed to be statistically sufficient, representative of the manufacturing sector, and appropriate for generating stable and unbiased parameter estimates.

Regarding market value data, this study primarily depended on IDX filings and company annual reports. In instances where IDX records were incomplete, Yahoo Finance was utilised as a supplementary source, particularly for historical stock price series. The dual-source approach increased the accuracy and reliability of market value computation across the samples. Therefore, the final dataset, which comprised 833 firm-year observations, provided a comprehensive and methodologically rigorous foundation for empirical analysis. Robust insights could be generated into the role of IC in shaping firm performance and market value among Indonesian manufacturing firms by incorporating detailed financial and market data via the Ev-VAIC.

3.3 Conceptual Framework

The current conceptual framework was designed to explicate the role of IC in influencing both the financial performance and the market value of firms. The IC has continuously been recognised as a multidimensional construct embodying organisational resources, capabilities, and knowledge, which can be mobilised to generate value and sustain

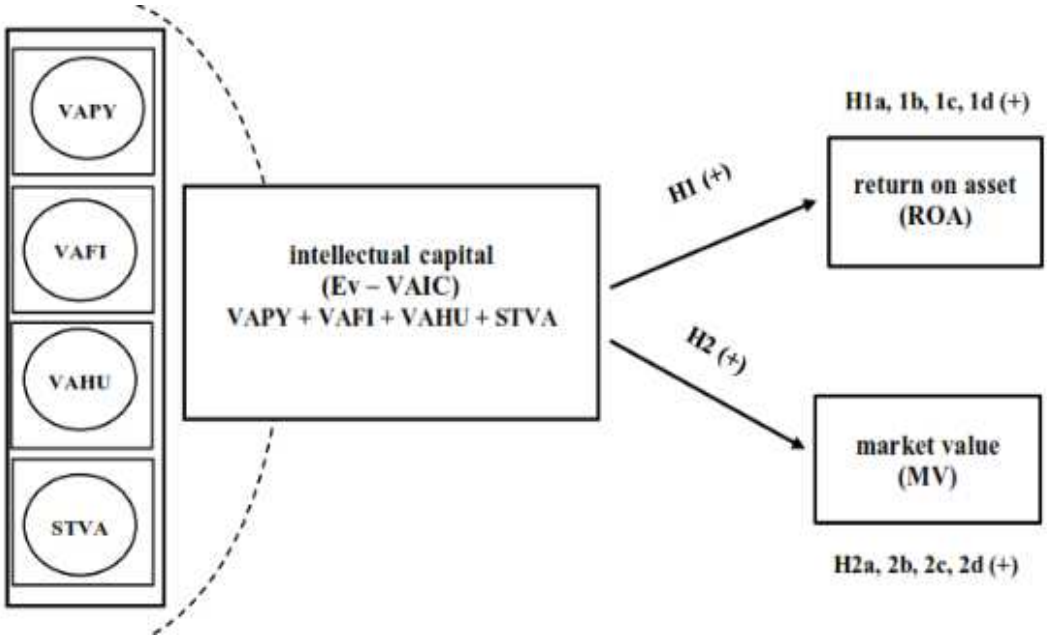
competitive advantages. The present study measured IC through the Ev-VAIC, which was an adapted and extended version of the VAIC (Pulic, 2000). The framework consists of four distinct dimensions, namely VAPY, VAFI, VAHU, and STVA, which capture both intangible (human and structural capital) and tangible (physical and financial capital) resources to offer a more holistic measurement of value creation within corporations. The RBV also elucidates intellectual capital (IC) has been shown to serve as a unique, valuable, and hard-to-replicate organisational resource that forms the foundation for superior firm performance, particularly when effectively integrated into organisational processes (Jones, 2019). Conversely, the signalling theory posits that enterprises with robust IC capabilities emit positive signals to the market, which subsequently influences investor perceptions and market valuation. Collectively, both theoretical perspectives justify the linkage of IC to financial performance, namely return on asset (ROA) and market value (MV).

Financial performance in the current study was represented by return on asset (ROA), which is a widely accepted indicator of corporate efficiency in utilising existing resources to generate profits. The return on asset (ROA) has frequently been employed to measure the internal operational benefits of intellectual capital (IC) by reflecting how effectively knowledge, skills, processes, and supporting infrastructure translate into tangible profitability. Meanwhile, market value embodies the external perspective on firm success, which indicates how investors and the market evaluate the overall value of a company by considering both financial strength and intangible resources. The present framework was predicated on the premise that IC should be appraised against both ROA and MV by concurrently considering both the internal (managerial and operational) and external (investor and market) dimensions of firm performance. Accordingly, this study hypothesised that IC produced a significant impact on ROA, in which companies with higher intellectual

capital (IC) tended to achieve superior profitability. Each IC component, namely VAPY, VAFI, VAHU, and STVA, was also propounded to exert a significant and positive influence on corporate financial outcomes measured by ROA.

The present study hypothesised that market value (MV) was significantly influenced by intellectual capital (IC), which posited that enterprises that could employ intellectual resources more efficiently would attain higher market value (MV). Particularly, VAPY, VAFI, VAHU, and STVA were hypothesised to produce a positive impact on market value, which reflected the role of IC as a key driver of the perceived and realised market value of a corporation. Figure 3.1 illustrates the present conceptual framework, which delineates how IC, measured by the Ev-VAIC and relevant components, influences both financial performance (ROA) and market value (MV). Specifically, IC (via Ev-VAIC) and the four components (VAPY, VAFI, VAHU, and STVA) were hypothesised to significantly impact both firm performance (financial performance and market value).

Figure 3.1
The Current Conceptual Framework



Note. Pulic (2000), Stewart (2001), Andriessen (2001), Van & Wachowicz (2008), and Anoraga (2008)

The conceptual framework establishes the theoretical relationships among the variables, with the following sections translating the relationships into measurable constructs through variable operationalisation in Table 3.1. The framework integrates theoretical propositions, summarises the proposed relationships, and serves as the foundation for empirical analysis.

Table 3.1
Variable Operationalisation

Variable	Indicator	Measurement
Dependent Variables:		
1. ROA	$\frac{\text{Earnings after interest and tax}}{\text{Total assets}}$	Ratio
2. MV	$\frac{\Sigma \text{ (closing stock price x transaction volume)}}{\Sigma \text{ transaction volume}}$	Ratio
Independent Variables:		
IC (Ev-VAIC)	VAPY + VAFI + VAHU + STVA	Ratio
a. VAPY	$\frac{VA}{PY}$	Ratio
b. VAFI	$\frac{VA}{FI}$	Ratio
c. VAHU	$\frac{VA}{HU}$	Ratio
d. STVA	$\frac{SC}{VA}$	Ratio

Note. Stewart (2001), Pulic (2000), Andriessen (2001), Van & Wachowicz (2008), and Anoraga (2008)

The present study use a dual-performance approach in measuring firm performance by integrating both financial-based (internal) and market-based (external) indicators. The finance-based measure, namely ROA, reflected internal operational efficiency, whereas the market-based measure, namely MV, represented the external valuation by investors. The two-dimensional perspective facilitated a more balanced and holistic comprehension of how IC influenced firm performance. Hence, this study aimed to capture both the internal outcomes and external perceptions of firm performance to provide a clearer picture of how IC could contribute to overall organisational success.

3.4 Hypothesis Development

This section elaborates on the hypotheses derived from the conceptual framework. Based on the resource-based view (RBV) and the value-creation perspective, the study posits that firms that utilise their intellectual capital (IC) more efficiently can enhance both internal and external performance, proxy by return on assets (ROA) and market value (MV).In this study, IC is measured using the Evaluation - Value Added Intellectual Coefficient (Ev-VAIC), which breaks IC down into four components: physical capital (VAPY); financial capital (VAFI); human capital (VAHU); structural capital (STVA). The study uses two performance outcomes: return on assets (ROA), which represents internal performance; and market value (MV), which is proxy by the volume-weighted average price (VWAP) and represents the firm's external market assessment.

3.4.1 Intellectual Capital (IC) and Return on Asset (ROA)

It has been demonstrated by preceding IC studies that enterprises exhibiting high IC efficiency are more adept at converting extant resources into value-added products and services. This ability is ultimately reflected in profitability indicators, such as return on assets

(ROA). Intellectual capital has been demonstrated to support process improvement, strengthen knowledge utilisation, and reduce operational slack, thereby enabling firms to generate higher earnings from the same level of assets. In the context of Ev-VAIC measurement, it is evident that each constituent element is designed to capture a distinct channel through which value is generated. VAPY and VAFI reflect the contribution of tangible and financial resources to value added, while VAHU and STVA represent the productivity of human capital and the supporting organisational infrastructure. ROA, being an internally oriented measure, is expected to be sensitive to improvements in these IC components. Accordingly, the following hypotheses are proposed:

H1: IC has a significant impact on the return on asset (ROA) of listed companies in Indonesia Stock Exchange

H1a: VAPY has a significant impact on ROA.

H1b: VAFI has a significant impact on ROA.

H1c: VAHU has a significant impact on ROA.

H1d: STVA has a significant impact on ROA.

3.4.2 Intellectual Capital and Market Value (MV)

From signalling and market-based perspectives, efficient IC management improves internal performance and conveys positive information to investors regarding the firm's innovation capability, long-term earnings prospects and competitive advantage. Firms that demonstrate robust IC utilisation are viewed as being more forward-looking and resilient, a perception that should be reflected in their market valuation. In this study, market value is captured by VWAP (Volume-Weighted Average Price), which provides a more representative measure of price formation because it incorporates both traded prices and

trading volume over a given period. Therefore, the study further posits that intellectual capital (IC) and its components will positively influence firms' market value (MV):

H2: Intellectual capital (IC) has a significant impact on the market value (MV) of companies listed on the Indonesia Stock Exchange.

H2a: VAPY has a significant impact on MV.

H2b: VAFI has a significant impact on MV.

H2c: VAHU has a significant impact on MV.

H2d: STVA has a significant impact on MV.

The study posits that greater efficiency in managing intellectual capital leads to enhance internal performance, as measured by return on assets (ROA), and to strengthen external performance, as measured by market value (MV). These hypotheses form the foundation for the empirical analyses that are presented in the subsequent sections.

3.5 Model Specification

The present section elucidates the financial model and analytical techniques employed to empirically investigate the theoretical relationships established within the conceptual framework. The models were developed through a structured panel data framework, which allowed the current study to capture both time-series and cross-sectional variations across firms. Utilising the E-views software facilitated comprehensive panel data analysis and ensured the robustness and validity of the findings. Particularly, the empirical investigation focused on the four diverse aspects of IC, namely VAPY, VAFI, VAHU, and STVA. All four constructs constituted the alternative measurement model, namely the Ev-VAIC, which enabled a more specific evaluation of how each IC element influenced financial performance, consists of return on asset (ROA) and market value (MV).

Component-wise regression analyses were also performed to obtain a clear picture of the relative contribution of each dimension. Every component was individually tested with financial performance (ROA) and market value (MV) to ascertain the specific impact of each IC component on firm performance. The first regression model tested the direct influence of IC on organisational performance according to H1:

$$\boldsymbol{ROA_{it} = \alpha 0 + \ \mu_i + \ \varepsilon_{it}} \qquad (3.1)$$

The component-level models for ROA are specified as follows:

$$\boldsymbol{ROA_{it} = \alpha 1 VAPY_{it} + \ \alpha 1 VAFI_{it} + \alpha 1 VAHU_{it} + \ \alpha 1 STVA_{it} + \ \mu_i + \ \varepsilon_{it}} \qquad (3.2)$$

Where:

ROA_it: represents the ROA of firm i at time t.

MV_it: denotes the MV of firm i at time t.

IC_it: emblematises IC (Ev–VAIC components) of firm i at time t.

α0 or β0: symbolises the constant term (intercept).

α1 or β1: serves as the coefficient quantifying the influence of IC.

μ_i: is the unobserved firm-specific individual effect.

ε_it: indicates the error term (idiosyncratic disturbance).

The second model evaluated the direct linkage between IC and MV (H2) as follows:

$$\boldsymbol{MV_{it} = \beta 0 + \ \mu_i + \ \varepsilon_{it}} \qquad (3.3)$$

The potential direct impact of each IC dimension on MV was appraised through the same approach, which enabled the current study to identify whether each component contributed additional explanations to external valuation results according to H2. The component-level models for MV are specified as follows:

$$\boldsymbol{MV_{it} = \beta 1 VAPY_{it} + \ \beta 1 VAFI_{it} + \beta 1 VAHU_{it} + \beta 1 STVA_{it} + \ \mu_i + \ \varepsilon_{it}} \qquad (3.4)$$

The breakdown into specific dimensions was essential, as the testing at the component level did not alter the initial hypotheses (H1 and H2), which remained focused on the broader construct of IC. Disaggregated analysis assisted in supplementing and extending hypothesis testing by pinpointing the individual impact of each component.

3.6 Panel Data Techniques

The present study employed a panel data modelling technique to scrutinise the impact of intellectual capital (IC) on financial performance in terms of return on asset (ROA) and market value (MV) on the financial performance of listed companies in Indonesia Stock Exchange from 2016 to 2022. Panel data are significant due to the capacity to encompass both cross-sectional and time-series dimensions. The technique is advantageous compared to solely utilising cross-sectional or time-series data, which allowed the current researcher to identify and incorporate firm-specific characteristics that remained constant over time (unobserved heterogeneity). In addition, the technique aided in increasing the number of observations and improving the accuracy and efficiency of the estimated coefficients (Baltagi, 2021). Panel data could also facilitate a more comprehensive representation of how IC would influence firm performance in the long term. The general panel data specification is expressed as follows:

$$\mathbf{Y\_it} = \boldsymbol{\alpha}\mathbf{\_i} + \boldsymbol{\beta}_1\mathbf{IC\_it} + \boldsymbol{\beta}_2\mathbf{CV\_it} + \boldsymbol{\varepsilon}\mathbf{\_it} \qquad (3.5)$$

Where

Y_(it): is the dependent variable (ROA or MV) for firm i at time t.

IC_it: represents the vector of IC variables (VAPY, VAFI, VAHU, and STVA).

CV_it: serves as an acronym for control variables (firm size, leverage, firm age, and industry dummies).

α_i: symbolises firm-specific unobserved effects.

ε_(it): denotes the idiosyncratic error term.

β(1): measures how much firm performance (Y) changes when IC (IC) changes by one unit, while holding other variables constant.

β(2): assesses the influence of CV on firm performance, while holding other variables constant

Thus, panel data analysis provided robust estimation techniques to appraise the impact of explanatory variables across both the cross-sectional and time dimensions. The fixed effects model (FEM) and the random effects model (REM) have most frequently been employed by existing researchers. The primary distinction between the two models is the approach to addressing unobserved firm-specific heterogeneity.

3.6.1 Fixed Effects Model

The Fixed Effects Model **(**FEM) postulates that each firm possesses unique and time-variant characteristics, which may exert an influence on the dependent variables. The subsequent analysis investigates the correlation of firm-specific impacts with the explanatory variables. Specifically, the FEM controls for unobserved influences via firm-specific intercepts, which eliminates potential bias engendered by omitted variables that remain constant over time. The model emphasises the concept of within-entity variation and seeks to elucidate how alterations within a specific firm serve to account for variations in financial performance in the long term. Accordingly, the FEM is appropriate for circumstances where unobserved individual impacts are correlated with the regressors (Gujarati & Porter, 2009). The FEM is mathematically expressed as:

$$\mathbf{Y_{it}} = \boldsymbol{\alpha_i} + \boldsymbol{\beta X_{it}} + \boldsymbol{\varepsilon_{it}} \qquad (3.6)$$

3.6.2 Random Effects Model

The Random Effects Model (REM) propounds that unobserved firm-specific effects are random and uncorrelated with the independent variables (Wooldridge, 2016). Contrary to the FEM, which focuses on within-firm variations, the REM incorporates both within-entity and between-entity differences to foster more efficient estimations when the underlying assumptions are valid. The approach is instrumental when firm-specific differences are considered random rather than systematic (Gujarati & Porter, 2009). The REM can be specified as follows:

$$\mathbf{Y_{it}} = \boldsymbol{\alpha} + \boldsymbol{\beta X_{\_it}} + \boldsymbol{\mu\_it} + \boldsymbol{\varepsilon\_it} \qquad (3.7)$$

The selection between the fixed effects model (FEM) and the random effects model (REM) is determined through a series of specification tests. The Chow test is applied to test the suitability of the FEM against the pooled ordinary least squares (POLS) model by investigating individual firm effects. The Hausman test is employed to examine whether the regressors were correlated with the individual unobserved effects. The Breusch-Pagan Lagrange multiplier (LM) test is conducted to evaluate the REM against the POLS model, especially when the FEM is rejected.

The Hausman Test was conducted in the current study. The null hypothesis of the test posited a consistent and efficient REM and the absence of a correlation between firm-specific effects and the explanatory variables. A p-value below 0.05 would lead to the rejection of the null hypothesis and suggest that the FEM could provide more consistent estimates. Conversely, a p-value exceeding 0.05 postulated the REM was preferred and could yield more efficient estimators (Gujarati & Porter, 2009; Wooldridge, 2016). The findings indicated that the fixed effects model (FEM) emerged as the most suitable approach for estimating the impact of intellectual capital (IC) on return on assets (ROA), owing to its

capacity to discern substantial unobserved variations across firms. Conversely, the random effects model (REM) was deemed more appropriate for the second hypothesis, which examined the direct effect of intellectual capital (IC) on market value (MV). The Hausman test did not reject the null hypothesis, which posited that firm-specific effects were uncorrelated with the explanatory variables in this model. The estimation process was conducted on the E-views 12 software. The generalised least squares (GLS) estimator was applied with White cross-section robust standard errors to address potential heteroskedasticity and serial correlation. The reliability and consistency of the results were also determined through additional diagnostic tests, including the Modified Wald Test for groupwise heteroskedasticity and the Wooldridge Test for autocorrelation. Summarily, panel data analysis offered an appropriate and robust framework for scrutinising how intellectual capital (Ev-VAIC) would influence firm performance from both financial and market perspectives. The method provided robust empirical evidence and allowed a more accurate estimation of intellectual capital (IC) on the financial performance, which using proxy return on asset (ROA) and market value (MV) of listed companies in Indonesia Stock Exchange from 2016 to 2022.

3.7 Diagnostic Test

An extensive series of diagnostic tests was performed on the E-views software to establish that the regression models employed in the current study fulfilled fundamental statistical assumptions. Conventional assumption tests could guarantee the reliability, validity, and robustness of the regression results. The tests consider the presence of normality, multicollinearity, heteroskedasticity, and autocorrelation, with failure to satisfy the assumptions leading to biased, inefficient, or inconsistent estimates.

3.7.1 Normality Test

The Jarque-Bera (JB) test is conducted to check whether residuals were normally distributed by appraising kurtosis and skewness. The null hypothesis is that residuals are normally distributed, with the decision rules as follows:

If p-value > 0.05: Accept H0 → Residuals are normally distributed.

If p-value < 0.05: Reject H0 → Residuals are not normally distributed.

The JB test demonstrated a highly significant value ($p < 0.05$) for both models in the current study, which highlighted non-normality. Nevertheless, the Central Limit Theorem validated that estimates of parameters were asymptotically normal and upheld the validity of hypothesis testing owing to a large sample size (n = 833) (Brooks, 2014; Baltagi, 2021).

3.7.2 Multicollinearity Test: Variance Inflation Factor (VIF)

Multicollinearity occurs amidst a high correlation between two or more IVs, which results in higher standard errors in the regression coefficients. The decision rules are:

VIF < 5: No multicollinearity concern (ideal).

VIF 5 to 10: Mild multicollinearity, use caution.

VIF > 10: Serious multicollinearity, trouble for regression.

All VIF values in this study were between 1.0088 and 1.8883, which ascertained that multicollinearity did not exist and the regression coefficients were fixed and interpretable (Asteriou & Hall, 2015; Wooldridge, 2016).

3.7.3 Heteroskedasticity

Homoscedasticity refers to equal residual variance across all levels of IVs. The Glejser test is employed to examine heteroskedasticity, with the decision rules as follows:

p-value > 0.05: Accept H0 → No heteroskedasticity.

p-value < 0.05: Reject H0 → Heteroskedasticity exists.

The current study discovered that the p-value was below 0.05 in the Glejser test, which indicated heteroskedasticity. White's heteroskedasticity-consistent standard errors were utilised for adjustments to enable unbiased inferences (Hayes, 2022; Stock & Watson, 2020).

3.7.4. Autocorrelation

Autocorrelation is the correlation between residuals across panel units or over time, which violates the assumption of independent error terms. While Durbin-Watson (DW) statistics can provide a rough indication (ideal value ≈ 2), the Wooldridge test can provide a more accurate indication for panel data. The decision rules are:

DW ≈ 2 or p-value > 0.05 (Wooldridge) → No autocorrelation

p-value < 0.05 → Autocorrelation exists

The Wooldridge test yielded a p-value below 0.05 in the present study, which reflected a strong autocorrelation in both models. Panel-corrected standard errors (PCSE) were employed during model estimation to offer valid inferences. Furthermore, the Breusch-Godfrey LM test was applied, as the test was appropriate for panel data and lagged predictors. The present study summarises the diagnostic assumptions, validity criteria, and remedial actions applied to the current study in Table 3.2. The rigorous applications of diagnostic tests and relevant interventions guaranteed that the regression findings possessed sufficient statistical strength and theoretical robustness. Simultaneously, the credibility of the inferences from the impact of intellectual capital (IC) on return on asset (ROA) and market value (MV) was ensured.

Table 3.2
Diagnostic Tests, Criteria, and Remedial Actions

Assumption	Criterion	Remedial Action if Violated
Normality	$p > 0.05$ (Jarque-Bera)	Apply data transformation (log or square root)

Multicollinearity	VIF < 10	Remove or combine correlated variables
Homoscedasticity	$p > 0.05$ (Glejser test)	Utilise robust SE or EGLS with weights
Autocorrelation	DW ≈ 2 or $p < 0.05$	Employ Newey-West SE or panel corrections

Note. *p* refers to the probability level utilised to determine statistical significance. CLT = Central Limit Theorem; VIF = Variance Inflation Factor; SE = Standard Error; PCSE = Panel-Corrected Standard Errors; GLS = Generalised Least Squares. Thresholds are based on standard econometric references (Asteriou & Hall, 2015; Wooldridge, 2016; Baltagi, 2021; Hayes, 2022).

3.8 A Remark

The present study employed a systematic and empirical research design for testing the hypotheses derived from established theories on the role of intellectual capital (IC). A panel data approach was applied to capture both cross-sectional and time-series variations across 125 manufacturing firms listed on the IDX from 2016 to 2022, which resulted in 833 firm-year observations after data diagnostics. The presented data were obtained from audited annual financial statements, whereas the market data were retrieved from company reports and the IDX website (www.idx.co.id). A purposive sampling technique was utilised to select firms that fulfilled rigorous inclusion criteria, namely the provision of complete financial data from 2016 to 2022, an IPO listing before 2015, and the availability of key IC indicators. The criteria ensured high data consistency, comparability, and robustness. The estimation of all panel data was conducted on the E-views 12 software to apply the POLS model, FEM, and REM, which were complemented by robust standard error adjustments. The models functioned to empirically examine H1 and H2, namely the relationship between IC and financial performance. The selection of the model adhered to a structured sequence involving the Chow test, Hausman test, and Lagrange Multiplier test to determine the most appropriate specification. The estimation strategy was designed to achieve both analytical rigour and

theoretical coherence by aligning model selection with the present conceptual framework. The utilisation of panel data analysis also allowed for capturing the dynamic nature of firm-level variations across time and entities, which could elevate the validity and reliability of the findings. Additionally, diagnostic tests were performed to ensure the fulfilment of regression assumptions, including normality, multicollinearity, heteroskedasticity, and autocorrelation, and robust results. Summarily, the present chapter has comprehensively delineated the research methodology, which encompasses the research design, data sources, the measurement of variables, model specification, estimation techniques, and diagnostic assessments. The systematic integration of methodological components ensures that the empirical analysis in the following chapter is grounded on a robust, consistent, and statistically valid foundation.

CHAPTER 4

FINDINGS AND DISCUSSIONS

4.1 Introduction

Chapter 4 presents the empirical results derived from exploratory and confirmatory approaches, which aim to quantitatively test the theoretical model established in Chapter 3. As reflected in the Evaluation-Value Added Intellectual Coefficient (Ev-VAIC), the focus is on gauging intellectual capital (IC) contribution in relation to the financial performance by using proxy namely return on asset (ROA) and market value (MV) on the financial performance of listed companies in Indonesia Stock Exchange from 2016 to 2022. This analysis begins with an exploratory phase, which involves gathering secondary data from manufacturing companies listed on the IDX from 2016 to 2022 based on their financial statements. The dataset is derived from 125 firms distributed across three sub-sectors: the consumer goods industry (36 firms), miscellaneous industries (32 firms), and the basic industry and chemicals sub-sector (57 firms). For each firm, IC is estimated using the Ev-VAIC model. Four key components of Value Added Physical - Evaluation (VAPY), Value Added Financial - Evaluation (VAFI), Value Added Human - Evaluation (VAHU), and Evaluation - Structural Value Added (STVA) underpin this framework. Yearly trends and the descriptive statistics of the three sub-sectors of IC components are represented using graphs and tables to indicate changes in average intellectual capital (IC) scores and respective components over seven years. While the consumer goods industry was found to demonstrate a consistently higher average intellectual capital (IC) scores, the basic industry and chemicals sub-sector reflected the highest growth in 2022. Panel data regression analyses are performed in the confirmatory phase via E-views 12 software for hypothesis

testing. Both the aggregate Ev-VAIC index and its components are applied separately to test both the direct effects (H1 and H2). The estimations are performed with pooled OLS (POLS), fixed effects model (FEM), and random effects model (REM), with the model selection decided based on specification tests entailing Chow test, Hausman test, and Breusch Pagan LM test. Notably, this holistic perspective provides a clear depiction of intellectual capital dynamics in the manufacturing sector and the differential value and performance contribution of its sub-components in different industries.

4.2 Descriptive Statistics

This section presents a descriptive overview of the data employed in the study. The primary objective of descriptive statistics is to provide a concise overview of the key characteristics of the variables, with particular emphasis on their central tendency, which is denoted by the mean, and their dispersion, which is characterised by the minimum, maximum and standard deviation. The provision of these summary measures enables to assess whether the data are reasonably distributed and suitable for subsequent estimation and hypothesis testing. The description will be grouped into two sections for clear presentation of the information. In the first section, presentation will be based on the statistical description of the selected pool sample based on the observation data used during the period of the study analysis. The other section will be based on the description of the statistics grouped according to the manufacturing sub-sectors listed on the Indonesia Stock Exchange (IDX).

4.2.1 Statistical Description of the Data

This subsection presents the descriptive statistics for all variables employed in the study. The mean, minimum, and maximum values were first reviewed to capture the extent of variation in firms' performance, the dispersion of intellectual capital (IC), and the sectoral

pattern of IDX manufacturing firms during 2016–2022. These summary measures indicate that the variables fall within reasonable economic ranges and no extreme outliers dominate the sample. In addition, skewness and kurtosis were checked to verify the distributional properties of data. As illustrated in Table 4.1, almost all variables fall within the commonly accepted ±2 threshold for both indicators, which implies that data are approximately normally distributed and hence suitable for subsequent parametric procedures.

Table 4.1
Descriptive Statistics, Skewness and Kurtosis of Variables (2016 – 2022)

Variable	Mean	Min	Max	Skewness	Kurtosis	Interpretation
Ev-VAIC	3.01	2.48	3.84	0.22	2.1	Nearly symmetric, mild positive tail
VAPY	0.44	0.36	0.57	0.4	1.8	Slight positive skew (few high values)
VAFI	0.27	0.1	0.41	0.1	2.4	Roughly symmetric
VAHU	1.63	1.38	2.02	0.45	2.1	Slight positive skew; higher human capital efficiency in later years
STVA	0.67	0.55	0.84	0.38	1.9	Fairly normal
ROA	0.03	0.02	0.05	0.55	2.7	Slight positive skew (few high-profit years)
MV	2,375.06	2,040.39	2,819.69	0.31	1.6	Mild right-skew (some firms have higher valuation)

Table 4.1 highlights the descriptive statistics, as well as the skewness and kurtosis values, for all the variables of interest. Following the elicited results, the moderate variations of the mean values of the IC components (VAPY, VAFI, VAHU, and STVA) suggest different efficiency levels in using physical capital, financial capital, human capital, and structural capital among manufacturing firms. The Ev-VAIC mean of 3.01 indicates that firms generally maintained a moderate level of overall IC efficiency between 2016 and 2022. Regarding distribution, all the variables demonstrated skewness and kurtosis values within the acceptable threshold of ±2. This finding confirms that the dataset approximates a normal

distribution. Slight positive skewness was observed for VAHU, ROA and MV. In this vein, some firms achieved higher levels of human capital efficiency, profitability, and market valuation than the sample average. Both VAFI and STVA reflected near-symmetric distributions, thus demonstrating stable firm performance. Collectively, these results ensure the statistical models' validity and unbiasedness by supporting the assumption of normality required for subsequent regression analyses.

4.2.2 Descriptive Statistics by Subsector (IDX Manufacturing)

Presenting the statistics by subsector helps identify which groups of firms have higher IC indicators and which show greater variation in performance, providing clearer context for the regression results discussed in this chapter. This approach is necessary because the manufacturing sector is heterogeneous; firms in basic industry and chemicals, consumer goods, and miscellaneous industries differ in cost structure, asset composition, and the intensity of intangible resources. These variations result in different levels of intellectual capital (IC) efficiency and, consequently, diverse financial and market outcomes. It also enables observation of whether IC-related variables correspond to the financial performance of firms listed on the IDX during 2016–2022. Subsectors with stronger IC measures and higher profitability or market valuation are viewed as operating in environments where intangible resources are mobilized more effectively, while those with weaker or more dispersed IC values may reflect structural or industry-specific constraints.

The consumer goods subsector includes 36 firms. PT Multi Bintang Indonesia Tbk (MLBI) recorded the highest IC average (12.24), while ALTO had the lowest (–0.41). Physical, financial, human, and structural capital respectively showed increases of 16%, 19%, 15%, and 20% in certain years, followed by decreases of 12%, 10%, 13%, and 10% in other periods. The miscellaneous industries subsector comprises 32 firms. PT Selamat

Sempurna Tbk (SMSM) achieved the highest IC average (8.50), whereas PT Sri Rejeki Isman Tbk (SRIL) recorded the lowest (–2.36). The components moved variably, with physical capital up 23% in 2021 and down 9% in 2017; financial capital up 30% in 2018 and down 8% in 2020; human capital up 19% in 2018 and down 8% in 2020; and structural capital up 19% in 2019 and down 9% in 2017. The basic industry and chemicals subsector consists of 57 firms. PT Barito Pacific Tbk (BRPT) posted the highest IC value (11.83), while PT Tirta Mahakam Resources Tbk (TIRT) had the lowest (–5.50). In 2022, physical, financial, human, and structural capital rose by 25%, 55%, 22%, and 21%, respectively, with declines of 9%, –10%, 10%, and 9% in earlier years. These variations in IC component efficiency influence financial outcomes, as reflected in ROA and market value (MV) across firms. The detailed numerical data supporting these results are provided in Appendix F.

In addition, the IC components (VAPY, VAFI, VAHU, and STVA) are expressed as ratios to enable comparison across years and firms, while ROA and MV are retained in their original values to preserve their economic meaning, as shown in Table 4.2.

Table 4.2
Average of IC components and Financial Performance of Manufacturing firms (2016 – 2022)

No.	Year	Ev-VAIC	IC				ROA	MV
			VAPY	VAFI	VAHU	STVA		
1	2016	2.95	0.39	0.28	1.64	0.64	0.05	2,222.10
2	2017	2.77	0.39	0.24	1.43	0.71	0.03	2,563.24
3	2018	3.20	0.44	0.37	1.83	0.55	0.04	2,819.69
4	2019	2.67	0.45	0.28	1.39	0.55	0.03	2,757.06
5	2020	2.48	0.36	0.1	1.38	0.64	0.02	2,110.50

6	2021	3.19	0.5	0.23	1.72	0.74	0.03	2,114.43
7	2022	3.84	0.57	0.41	2.02	0.84	0.04	2,040.39

Note. Data generated by the researcher based on panel data from the Indonesia Stock Exchange (IDX) from 2016 to 2022.

Table 4.2 highlights that the Ev-VAIC values range from 2.48 in 2020 to 3.84 in 2022, indicating fluctuations in IC efficiency over time. Among the components, VAHU shows the strongest contribution, whereas VAFI records the lowest. Overall, higher IC efficiency corresponds with increases in ROA and MV, suggesting that the effective utilisation of intangible resources enhances both profitability and market valuation.

4.3 Empirical Result

This section presents the empirical results derived from hypothesis testing to examine the influence of intellectual capital (IC) on firms' financial performance (ROA) and market value (MV) via Ev-VAIC. The current analysis was conducted using panel data regression. Both FEM and REM estimations were employed using the E-views software. The final models were validated through PCSE to ensure the outcome robustness. Notably, empirical findings are discussed in line with the hypotheses developed:

H1: IC has a significant impact on on the return on asset (ROA) of listed companies in Indonesia Stock Exchange.

H1a: VAPY has a significant impact on ROA.

H1b: VAFI has a significant impact on ROA.

H1c: VAHU has a significant impact on ROA.

H1d: STVA has a significant impact on ROA.

H2: IC has a significant impact on the market value (MV) of listed companies in Indonesia Stock Exchange.

H2a: VAPY has a significant impact on MV.

H2b: VAFI has a significant impact on MV.

H2c: VAHU has a significant impact on MV.

H2d: STVA has a significant impact on MV.

4.3.1 Empirical Results for Hypothesis 1 (IC → ROA)

Based on the panel regression estimation results, the relationships between IC components and financial performance (ROA) were formally expressed with the following mathematical models:

$$\boldsymbol{ROA_{it} = 0.6477 + 0.0105\, VAPY_{it} + 0.0393\, VAFI_{it} + 0.0094\, VAHU_{it}}$$
$$\boldsymbol{- 0.0027\, STVA_{it} + \mu_i + \varepsilon_{it}}$$

Following the VAPY coefficient (0.0105), ROA rose by 0.0105 with an increase of physical capital by one unit. This relation proves to be statistically significant. The VAFI coefficient (0.0393) highlighted a positive, statistically significant effect, indicating that financial capital makes the most significant contribution to organisational profitability: a 1 unit increase in VAFI boosts the ROA by 0.0393. Furthermore, the VAHU coefficient's (0.0094) positive and significant effect underscores the significance of human capital in firm performance. The STVA (-0.0027) proved statistically insignificant with a negative coefficient. Based on this sample, structural capital does not meaningfully contribute to ROA. The findings from this study are summarized and presented in Table 4.6, which provides the complete panel estimation results of the FEM. This model examines the influence of intellectual capital (IC) components, compering VAPY, VAFI, VAHU, and STVA on ROA.

Table 4.3
Panel Estimation Results for IC on ROA (FEM Model)

Variable	Coefficient	Robust t-statistic	p-value	Significance
VAPY	0.0105	2.127	0.0336	Significant (+)
VAFI	0.0393	7.188	0.0001	Strong Significant (+)
VAHU	0.0094	4.351	0.0001	Strong Significant (+)
STVA	-0.0027	-1.326	0.1880	Not Significant
R-squared	0.6477			

Note. The table summarises the FEM estimation results for the effect of IC on ROA. Fundamentally, VAPY, VAFI, and VAHU show positive and significant effects, with VAFI and VAHU strongly significant at the 1% level. STVA is negative and insignificant, indicating no meaningful impact on firms' profitability. Analyses were performed using E-views (2024).

Table 4.3 present that VAPY, VAFI, and VAHU were significantly and positively related to ROA at the 5% and 1% levels. Nonetheless, STVA did not demonstrate a statistically significant relationship with ROA. The R-squared of 0.6477 discloses that approximately 64.77% of the ROA variation is explained by the model. As the IC components contribute to business performance, H1 is supported.

Regarding Model 1 (H1), the Chow test statistic ($F = 2.9132$, $p = 0.0001$) confirms the need to regulate firm specific effects. This contradicts the use of the POLS model. The Hausman test ($\chi^2 = 38.6366$, $p = 0.0001$) confirms the use of the FEM, in which unobserved firm specific attributes are connected with IC elements. The Chow test results proved to be statistically significant. Hence, POLS is not the correct model. A model adjusting for individual firm effects is required. Given the significant Hausman test result, the FEM is superior to the REM. Firm-specific unobserved determinants (managerial talent, firm culture, or focus strategy) are expected to be correlated with the explanatory variables (IC

dimensions), and require control to avoid deriving biased and inconsistent estimators. In this study, FEM was applied to Model 1 to control firms' time invariant heterogeneity in explaining business performance variability (ROA).

4.3.2 Empirical Results for Hypothesis 2 (IC → MV)

The relationships between IC components and MV were formally expressed with the following mathematical models:

$$\boldsymbol{MV_{it} = 0.0482 + 0.0925\, VAPY_{it} - 67.0375\, VAFI_{it} + 108.5808\, VAHU_{it}}$$
$$\boldsymbol{+ 5.7663\, STVA_{it} + \mu_i + \varepsilon_{it}}$$

The VAPY (0.0925) demonstrated a weakly positive but statistically non-significant effect on MV. While physical capital might be positively correlated with market value, its effect is not strong and not reliably separable in this model. Contrary to expectations, VAFI (–67.0375) denoted a negative, marginally significant effect on market value (MV). As such, higher financial capital is associated with lower market value. This finding could reflect market scepticism toward overleveraging or inefficient deployment of financial assets in some companies. The VAHU (108.5808) exerted a highly positive and statistically significant influence. As firms with higher human capital are more valued by the market, workers are considered the key source of value creation. The STVA (5.7663) exhibited a positive yet statistically insignificant influence, implying that structural capital does not have an explicitly direct effect on MV.

Following the financial performance analysis, Model 2 explored IC's impact on firms' MV. The REM was selected as the preferred estimation technique following its efficiency in capturing both firm-specific and random variations across the panel dataset. Table 4.7, which reports the coefficient estimates, robust t-statistics, and p-values for each

IC component (VAPY, VAFI, VAHU, and STVA) in explaining firms' market value (MV), summarises the regression findings.

Table 4.4
Panel Estimation Results for IC on MV (REM model)

Variable	Coefficient	Robust t-statistic	p-value	Significance
VAPY	0.0925	0.001	0.9986	Not Significant
VAFI	-67.0375	-1.783	0.0747	Marginally Significant (-)
VAHU	108.5808	4.259	0.0001	Strongly Significant (+)
STVA	5.7663	0.259	0.7948	Not Significant
R-squared	0.0482			

Note. The table summarises the REM estimation results for the effect of intellectual capital (IC) on market value (MV). VAHU shows a strong positive and significant effect, while VAFI is marginally significant with a negative sign. VAPY and STVA are insignificant, indicating no material influence on MV. Analyses were conducted using E-views (2024).

The VAHU exerted a strongly positive, significant influence on market value (MV), VAFI demonstrated a weakly significant, negative influence on MV, and both VAPY and STVA lacked statistically significant influences (see Table 4.4). With the estimate of explanatory power of R squared being 0.0482, approximately 4.8% of the variation in MV is restricted in relation IC. The H2 is partially corroborated, with VAHU being the best predictor. Regarding Model 2 (H2), the Hausman test ($\chi^2 = 31.9148$, $p = 0.0001$) indicates possible correlation. Nonetheless, the LM test (Breusch-Pagan = 1068.277, $p = 0.0001$) would rather have a REM over POLS. The Hausman test result proved insignificant, highlighting the REM's usability; no significant correlation is identified between the unobserved firm specific effects and the explanatory variables. As MV represents external investor sentiment in place of internal firm characteristics, REM is retained for improved

generalisability and statistical efficiency. The LM test also ratified the use of REM in place of POLS. The use of REM in Model 2 provides more precise estimations under the presumption that individual effects are random and not correlated with the predictors. It is more suitable given that external MV will be less influenced by firm internal persistent traits and more influenced by external market perception and general firm traits.

This section presents a summary of the study findings based on the objectives of study. The first objective of study involves examining the effect of IC components on financial performance (ROA). The IC components entail physical capital (VAPY), financial capital (VAFI), human capital (VAHU), and structural capital (STVA). Following the FEM results, physical capital (VAPY = 0.0105, p = 0.0336), financial capital (VAFI = 0.0393, p = 0.0001), and human capital (VAHU = 0.0094, p = 0.0001) exerted positive, statistically significant effects on ROA. Efficiency in tangible, financial, and human resources enhances organisational profitability. As structural capital (STVA = –0.0027, p = 0.1880) proved insignificant, structural mechanisms contributed little to profitability during the study period.

The second objective involves assessing the influence of the same intellectual capital (IC) components on market value (MV). With regard to the REM, human capital (VAHU = 108.5808, $p < 0.001$) exerted a strongly positive, significant influence on MV. Organisations demonstrating enhanced employee efficiency and knowledge creation attain elevated MV. Financial capital (VAFI = –67.0375, p = 0.0747) exhibited a marginally negative association, while physical capital (VAPY = 0.0925, p = 0.9986) and structural capital (STVA = 5.7663, p = 0.7948) proved to be statistically insignificant. In line with the elicited outcomes, intangible resources (particularly human capital efficiency) substantially influences market valuation in the Indonesian context. The revised models and methodologies proved successful in achieving the study objectives. In terms of IC (particularly financial and human

capital) play a pivotal role in enhancing both firms' internal performance (ROA) and external market valuation (MV), thus meeting the general research objective.

4.3.3 Summary of Hypothesis Testing

The findings derived from the panel estimations for both models were consolidated to evaluate the overall validity of the study hypotheses. This section provides an overview of the hypotheses results, reflecting the statistical relationships between each IC component, as well as the firms' ROA and MV. Table 4.5 presents the test outcomes.

Table 4.5
Summary of Hypothesis Testing Results

Hypothesis	Relationship	Coefficient (β)	p-value	Result	Remarks
H1a	VAPY → ROA	0.010489	0.0336	Supported	Positive and significant effect
H1b	VAFI → ROA	0.039287	0	Supported	Strong positive effect
H1c	VAHU → ROA	0.009364	0	Supported	Strong positive effect
H1d	STVA → ROA	−0.002701	0.188	Not Supported	Insignificant negative effect
H2a	VAPY → MV	0.09247	0.9986	Not Supported	No significant relationship
H2b	VAFI → MV	−67.0375	0.0747	Partially Supported	Marginal negative effect
H2c	VAHU → MV	108.5808	0	Supported	Strong positive effect
H2d	STVA → MV	5.7663	0.7948	Not Supported	Insignificant effect

Note. Table 4.5 presents the hypothesis testing summary. VAFI and VAHU positively and significantly affect ROA, while only VAHU significantly influences MV. VAPY and STVA are insignificant in both models, showing minimal impact on firm performance.

Based on the hypothesis results, IC plays a crucial role in enhancing firm outcomes. Financial capital (VAFI) and human capital (VAHU) components significantly impacted profitability (ROA), with VAHU demonstrating a positive influence on market value (MV). Conversely, physical capital (VAPY) and structural capital (STVA) demonstrated no significant impact. Indonesian firms continue to prioritise financial capital and human capital over tangible assets or organisational systems to maintain performance.

4.4 Diagnostic Test

It is essential to verify that the estimated models comply with the key assumptions of classical linear regression before interpreting the regression outcomes. Hence, several diagnostic tests were performed using E-views to examine the models' validity and reliability: (1) to examine the impact of the IC components (VAPY, VAFI, VAHU, and STVA) on ROA; and (2) to assess the impact the IC components on MV. Tests for normality, heteroskedasticity, autocorrelation, and multicollinearity were the diagnostic evaluations included alongside the Durbin–Watson statistic.

4.4.1 Normality Test

A Jarque-Bera (JB) test was conducted to evaluate the normality of the residuals in each regression model. The null hypothesis (H_0) assumes the residuals to be normally distributed. A p-value exceeding 0.05 suggests that the residuals follow a normal distribution. Conversely, a p-value below 0.05 indicates deviation from normality in Table 4.6.

Table 4.6
Results of JB Normality Test

Model	Jarque–Bera	Probability	Decision
Model 1 (ROA)	45458.48	0.0000000	Residuals not normally distributed*

Model 2 (MV)	676.9547	0.0000000	Residuals not normally distributed*

Note. The Jarque-Bera values were not generated in the E-views output; regardless, based on the large sample size (n = 833) and the results of other diagnostic tests (heteroskedasticity and autocorrelation), it can be inferred that the residuals are not perfectly normally distributed.

The JB statistic of 45,458.48 in Model 1 highlights a significant departure from normality. Hence, the residuals are highly skewed or exhibit extreme kurtosis. Similarly, the JB value of 676.9547 and probability of 0.000000 in Model 2 reject the null hypothesis of a normal distribution. This violation of normality does not invalidate the regression models, particularly in large samples such as that examined in this study (n = 833). Following the Central Limit Theorem, the sampling distribution of the estimators approaches normality with an adequately large sample size. This holds true even if the residuals themselves are not normal. The use of PCSE, which compensates for the potential issues arising from non-normal residuals, ensures that statistical inference remains valid and reliable. Despite not meeting the strict assumption of residual normality, both the models' robustness of estimation technique ensures the results remain consistent, unbiased and suitable for hypothesis testing.

4.4.2 Multicollinearity Test: Variance Inflation Factor (VIF)

A multicollinearity test was conducted using the variance inflation factor (VIF) to ascertain whether the independent variables in the model are highly correlated with one another. While a VIF value exceeding 10 indicates a serious multicollinearity problem, counterparts below this threshold suggest the variables to be sufficiently independent. Table 4.7 presents the test results.

Table 4.7
Variance Inflation Factor (VIF) Results

Model	Variable	Un-centred VIF	Centred VIF

Model 1 (ROA)	VAPY	1.353228	1.128866
	VAFI	1.467426	1.404038
	VAHU	2.092124	1.505113
	STVA	1.163555	1.008873
Model 2 (MV)	VAPY	1.41001	1.176234
	VAFI	1.76002	1.683992
	VAHU	2.36399	1.700698
	STVA	1.664182	1.009314

Note. All VIF values are well below the threshold of 10, indicating no serious multicollinearity problem in either model. This suggests that the explanatory variables are sufficiently independent from one another.

All the centred VIF values for Model 1 (ROA) and Model 2 (MV) tabulated in Table 4.7 are well below the critical limit of 10, ranging between 1.01 and 1.70. Based on this finding, none of the explanatory variables exhibit excessive correlation. The VIF values for VAPY (1.13), VAFI (1.40), VAHU (1.51), and STVA (1.01) are consistently low for Model 1, but remain modest in Model 2 despite the inclusion of ROA as an additional predictor: VAPY (1.18), VAFI (1.68), VAHU (1.70), and STVA (1.01). Both the study models did not demonstrate multicollinearity issues. In line with the low VIF values, each independent variable contributes unique explanatory power to the regression. The coefficient estimates are stable, unbiased, and reliable for subsequent interpretation and hypothesis testing.

4.4.3 Heteroskedasticity

The Glejser test for heteroskedasticity requires the residuals to have constant variance at each level of the explanatory variables. Inefficient estimates and potentially-biased standard errors could occur with the violation of this assumption. As the null hypothesis (H_0) assumes homoscedasticity, the residuals are distributed equally across

observations. Table 4.8 presents the Glejser test outcomes, which revealed unequivocal indications of heteroskedasticity.

Table 4.8
Results of Glejser Heteroskedasticity Test

Model	F-statistic	Prob. F	Obs*R²	Prob. Chi-Square	Decision
Model 1 (ROA)	11.11681	0.0000	42.45569	0.0000	Reject H_0 – heteroskedasticity present
Model 2 (MV)	21.47473	0.0000	95.72430	0.0000	Reject H_0 – heteroskedasticity present

Note. Both models recorded p-values less than 0.05, indicating that the null hypothesis of homoscedasticity is rejected. Hence, heteroskedasticity exists in both models. To correct this issue, panel-corrected standard errors (PCSE) were employed in the subsequent estimation, ensuring valid statistical inference and robust coefficient estimates.

While Model 1 (ROA) yields an F-statistic of 11.11681 and a chi-square value of 42.45569 (both with a probability of 0.0000), Model 2 (MV) reflects an F-statistic of 21.47473 and a chi-square value of 95.72430 (both with a probability of 0.0000). The null hypothesis is rejected for both models, with all the p-values below the 0.05 significance level. As such, the presence of heteroskedasticity is confirmed. Although the residuals' variance is not constant across observations in either model, this violation of the homoscedasticity assumption does not invalidate the regression results. The PCSE was employed in the estimation procedure to generate robust and efficient estimators. Despite the presence of heteroskedasticity, both the study models remain statistically reliable for interpretation and subsequent hypothesis testing.

4.4.4 Autocorrelation

An additional diagnostic test was performed to detect any serial correlation in the error terms and ensure that the regression models meet the assumption of independent residuals. This step is crucial for confirming that the estimated coefficients are efficient and free from systematic patterns across observations. Furthermore, the Breusch-Godfrey serial correlation LM test was employed. The null hypothesis (H_0) assumes no serial correlation among the residuals in Table 4.9.

Table 4.9
Results of Breusch-Godfrey Serial Correlation LM Test

Model	F-statistic	Prob. F	Obs*R^2	Prob. Chi-Square	Decision
Model 1 (ROA)	33.75161	0.0000	62.93227	0.0000	Reject H_0 – autocorrelation present
Model 2 (MV)	485.3576	0.0000	450.2973	0.0000	Reject H_0 – autocorrelation present

Note. Both models show p-values below 0.05, confirming the presence of autocorrelation. To address this, the study applied PCSE estimation, which produces unbiased and efficient estimators even when serial correlation is present.

Table 4.9 presents the Breusch–Godfrey serial correlation LM test results. For Model 1 (ROA), the F-statistic is 33.75161 with a probability value of 0.0000, and the ObsR^2 statistic is 62.93227, with a Chi-Square probability of 0.0000. For Model 2 (MV), the F-statistic is 485.3576 and the ObsR^2 statistic is 450.2973, both with p-values of 0.0000. The null hypothesis (H_0) of no serial correlation is rejected for both the models, with all the p-values below the 0.05 significance level. The elicited findings suggest a correlation between the error terms across observations given the presence of autocorrelation in both the models'

residuals. Regardless, this issue was rectified using the PCSE estimation method, which furnishes robust and efficient standard errors even in the presence of serial correlation. The regression results maintain statistical reliability and validity for subsequent analysis and hypothesis testing.

Based on the diagnostic tests, the regression models are statistically sound for subsequent analysis. While the JB test indicates non-normal residuals, the large sample size implies the estimations' consistency with the Central Limit Theorem. The Glejser and Breusch-Godfrey LM tests detected heteroskedasticity and autocorrelation. Nonetheless, both issues were effectively corrected using PCSE. All VIF values were below the threshold of 10, thus confirming the absence of multicollinearity. The current findings corroborate that the models satisfy assumptions and can be reliably employed in the empirical analysis stage for hypothesis testing.

4.5 Discussion of Findings

This section elaborates on the empirical findings, with a focus on the influence of each intellectual capital (IC component (physical capital, financial capital, human capital, and structural capital) toward firms' financial performance (return on asset and market value). This discussion draws on the resource-based view (RBV) and signalling theory to explain how intangible resources shape both internal operational efficiency and external investor perception. As such, the elicited results are situated within the broader Indonesian context, where industrial structures significantly differ and the IC maturity level varies across the miscellaneous, consumer goods, and basic industry and chemicals sub-sectors. Two interconnected mechanisms are used by IC to influence organisational success. While IC internally enhances operational efficiency based on RBV, it externally conveys credibility

and strategic strength to investors following the signalling theory. Regardless, the magnitude of these effects varies by industry. Financial and physical assets continue to serve as the operational backbone in capital intensive (basic industry and chemicals) sectors, albeit with minimal contributions made to signalling effects. Within knowledge driven sectors such as consumer goods, the dual capacity of human capital functions serves as both a productive resource and a signalling mechanism. This dual role is to enhancing profitability and investor confidence. Indonesia's transitional movement toward a knowledge-based economy is indicated through the miscellaneous industry sector. Firms in this category exhibit uneven levels of IC adoption: some of them effectively leverage human and financial resources, while smaller ones often lack structured systems (STVA) to institutionalise knowledge creation and innovation. This finding implies a persistent structural limitation: while individual competencies (VAHU) and financial access (VAFI) exhibit signs of improvement, organisational learning and knowledge management mechanisms remain under developed.

This study further maps the intellectual capital profile across Indonesian manufacturing sub-sectors listed on the IDX, covering the consumer goods industry, the miscellaneous industries, and the basic industry and chemicals segment in one integrated view. The consumer goods industry comprises 36 corporates, in which PT Multi Bintang Indonesia Tbk (MLBI) recorded the highest IC average at 12.24, indicating superior efficiency in leveraging intellectual resources for value creation, while ALTO documented the lowest IC average at –0.41, implying a relatively weak capacity to utilise intangible assets for improving firm performance. Within this sub-sector, the physical capital increased by 16% in 2019 but decreased by 12% in 2021; financial capital increased by 19% in 2019 yet decreased by 10% in 2021; human capital increased by 15% in 2019 but decreased by 13%

in 2017; and structural capital increased by 20% in 2021 and decreased by 10% in 2019. In the miscellaneous industries, which consist of 32 corporates, PT Selamat Sempurna Tbk (SMSM) recorded the highest IC average at 8.50, indicating stronger efficiency in leveraging intellectual resources for value creation, whereas PT Sri Rejeki Isman Tbk (SRIL) documented the lowest IC average at –2.36, implying a relatively weak capacity to utilise intangible assets to enhance firm performance. Using the revised measurement formula, the IC components in this group show that physical capital increased by 23% in 2021 but declined by 9% in 2017; financial capital rose by 30% in 2018 but fell by 8% in 2020; human capital grew by 19% in 2018 but decreased by 8% in 2020; and structural capital increased by 19% in 2019 but declined by 9% in 2017. The basic industry and chemicals sub-sector, which represents the last manufacturing sub-sector and comprises 57 organisations, displayed the widest IC dispersion: the maximum IC value was recorded by PT Barito Pacific Tbk (BRPT) at 11.83, indicating that the firm was able to mobilise and convert its intellectual resources into value more efficiently than the other companies in the sample, while the minimum IC value was observed for PT Tirta Mahakam Resources Tbk (TIRT) at –5.50, suggesting a relatively weak capability to utilise intangible assets for supporting operational and financial performance during the period under review. To provide a clearer view of component-wise movements, the physical capital, financial capital, human capital, and structural capital in this sub-sector were found to be bound to increase by 25%, 55%, 22%, and 21%, respectively, in 2022; nonetheless, the decrease for each IC component varied by value, with physical capital declining by 9% in 2016, financial capital by 10% in 2020, human capital by 10% in 2019, and structural capital by 9% in 2018. These different efficiencies across IC components can have key implications for organisational financial outcomes: as reflected in ROA, variations in human capital, structural capital, and financial

capital efficiency can affect a firm's ability to enhance operational productivity and profitability, while the same variations may concurrently influence market value by shaping investors' perceptions of the firm's intangible strengths, growth potential, and overall competitiveness. In line with this, the IC components (VAPY, VAFI, VAHU, and STVA) are presented as ratio-based measures to allow direct comparison across years and firms, while ROA and MV are likewise shown in their original values to preserve the economic meaning of the data. The annual average of Ev-VAIC and its components of VAPY, VAFI, VAHU, and STVA, alongside the financial indicators ROA and MV, for manufacturing firms between 2016 and 2022, ranged from 2.48 in 2020 to 3.84 in 2022, with this moderate fluctuation of Ev-VAIC values indicating varying efficiency levels in using intellectual capital over time; VAHU highlights the dominant role of human capital by recording the highest average among the components, while VAFI suggests a limited contribution of financial capital to value creation by recording the lowest average. In general, the corresponding changes in ROA and MV align with years of higher IC efficiency, meaning that the improved use of intangible resources enhances both profitability and market valuation, and this finding highlights the organisational ability to convert intellectual resources into financial outcomes.

4.5.1 Intellectual Capital (IC) and Return on Asset (ROA)

The physical capital (VAPY), financial capital (VAFI), and human capital (VAHU) significantly, positively influenced firm profitability (ROA), while structural capital (STVA) revealed an insignificant, negative effect. These outcomes supported H1a through H1c. Indonesian firms with higher profitability can effectively mobilise tangible resources, financial strength, and human expertise. Within the RBV framework, the valuable, rare and inimitable assets represented by these three components collectively enhance operational

efficiency and competitive advantage. Statistical evidence reinforces this conclusion. The coefficients of VAFI ($\beta = 0.0393$, $t = 7.19$, $p < 0.001$) and VAHU ($\beta = 0.0094$, $t = 4.35$, $p < 0.001$) demonstrated strong, highly significant positive effects. Hence, firms with sound financial management and competent workforce achieve superior performance. The VAPY ($\beta = 0.0105$, $t = 2.13$, $p = 0.0336$) also made positive contributions, reflecting the continued importance of efficiently using physical resources, particularly in manufacturing and resource-based sectors. Following the model's explanatory power ($R^2 = 0.6477$), approximately 65% of the ROA variation can be explained by the IC variables, thus demonstrating the model's robustness and explanatory adequacy.

The study findings corroborate those of Bontis (2001), Kamath (2015), and Batubara et al. (2021), who asserted that financial control and human capability continue to influence profitability in emerging economies. Conversely, the negative yet insignificant coefficient of STVA ($\beta = –0.0027$, $p = 0.188$) suggests that structural systems (including databases, routines, and organisational learning) have yet to effectively function as value-creation mechanisms. This phenomenon reflects the prevailing industrial landscape in Indonesia, in which numerous enterprises continue to rely on tangible assets and short-term financial gains compared to the adoption of formalised knowledge structures and digital infrastructure. Analysis of sectoral variations advances the understanding of this dynamic. In the basic industry and chemicals sector, VAPY and VAFI's strong effects denotes its reliance on production capacity, supply chain financing, and cost-efficiency in managing large-scale assets an outcome aligned with RBV's tangible asset orientation. The consumer goods industry demonstrates heightened sensitivity to VAHU. Product innovation, marketing agility, and brand management, all of which are contingent on human resource creativity and capability, are key catalysts for this sector's profitability. Driven by greater heterogeneity,

the miscellaneous industry category has demonstrated a more varied set of outcomes. Certain firms exhibit the optimal utilisation of human and financial capital, while others demonstrate deficiencies due to sub-optimal structural capital and informal management systems. These cross-sector variations underscore the non-uniform contribution of IC, which is contextually shaped by industry structure and resource dependency. While capital intensive sectors benefit more from financial and physical assets, knowledge-driven sectors achieve greater performance from human capital investments.

4.5.2 Intellectual Capital (IC) and Market Value (MV)

In terms of market value (MV), human capital (VAHU) exerted a robust and substantial positive influence, financial capital (VAFI) demonstrated a marginal negative relationship, and both physical capital (VAPY) and structural capital (STVA) proved to be statistically insignificant. These outcomes partially and strongly support H2b and H2c, respectively. Following the REM, VAHU ($\beta = 108.58$, $t = 4.26$, $p < 0.001$) is the only IC component that meaningfully contributes to market value. The VAFI ($\beta = –67.04$, $t = –1.78$, $p = 0.0747$) is negatively associated with MV, albeit marginally. The model's modest explanatory power ($R^2 = 0.0482$) suggests that a broader set of external factors (investor sentiment, governance practices, and macroeconomic conditions) shapes MV. Regarding the signalling theory, human capital is the most credible signal of firm quality in the Indonesian capital market. Investors place greater trust in firms with visible managerial competence, innovative capacity, and leadership strength. These attributes, which are more tangible than financial structure or operational assets, coincides with Chen et al. (2005) and Khalique et al. (2013).

Based on these authors, investors in developing economies tend to interpret human capital as a proxy for long-term competitiveness and strategic adaptability. The marginally

negative impact of financial capital (VAFI) may indicate investor caution toward firms with high leverage or aggressive financing strategies, signalling financial instability. Possibly due to the lack of detailed IC disclosures in financial statements, the insignificance of physical capital (VAPY, $\beta = 0.0925$, $p = 0.9986$) and structural capital (STVA, $\beta = 5.7663$, $p = 0.7948$) suggests that investors in Indonesia are less responsive to physical or structural efficiency. A more detailed investigation is afforded by sectoral analysis: the VAHU exerted the most significant influence on market value (MV) in the context of the consumer goods industry, as investor correlate skilled human capital with innovation, brand equity, and customer trust. In line with the signalling theory, firms communicate their quality through human-driven achievements. Financial capital is indispensable for facilitating production in the basic industry and chemicals sub-sector. Nonetheless, it might not directly translate into investor confidence. On another note, elevated debt levels or delayed technological adoption can be interpreted as risk signals, thus adversely impacting market perceptions. A wide variation in results is observed in the miscellaneous industry. Perceivably, certain sub-segments are inclined to offer favourable recognition to firms demonstrating transparent leadership or corporate governance. The inconsistent nature of the information flow could cause other sub-segments to adopt an indifferent stance. As the most compelling external indicator in all sectors, human capital affirms its position as the conduit between internal capacity and market acknowledgement in Indonesia's evolving capital market.

The study results offer several managerial and policy implications. Firms should intensify strategic investment in human capital development, innovation culture, and knowledge-sharing systems to sustain business profitability and enhance investor confidence. Policymakers, in turn, can accelerate the transition toward a knowledge-based economy by supporting digital transformation, intellectual property protection, and human-

resource upskilling initiatives. While tangible and financial assets remain necessary for operational performance, the strength of human capital and the institutionalisation of knowledge systems are the key catalysts for long-term competitiveness and for advancing Indonesia's progress toward sustainable, knowledge driven growth.

4.6 A Remark

Moreover, the results in the current chapter support the overall development of intellectual capital in Indonesian firms, especially publicly listed manufacturing corporations, which are seeing growing pressures to embrace more knowledge-driven and technology enabled activities due to Industry 4.0, volatile supply chain, and stricter disclosure requirements imposed by regulatory authorities. Most current evidence points to more prioritization in human capital enhancement (reskilling, digital literacy, and productivity pay schemes) and furthering transparency in the creation of intellectual capital. These trends support the derived result regarding the prominence of VAHU in terms of overall market relevance, inasmuch as the current capital market rewards companies with productive, talented, and innovative-minded employees even if structural capital efficiency and value-for-money gains in terms of bottom line enhancement have not been entirely factored into overall capitalization. Moreover, the factored result also points to the Indonesian capital market being in the transitioning period with the prioritization of internal creation, utilization, and exploitation of intellectual and other intangible capital, such that although capital creation has occurred, capital disclosures, framing, and pricing in terms of capitalization by capital agents (fund managers, institutional investors, analysts) have been made negligible. This makes way for one significant implication related to managerial-level treatment during capital reforms inasmuch as capitalization per se must be further improved,

necessitating signalling, institutionalization, and related disclosures with respect to capital intentions if capital creation per se is to be embedded in capitalization.

CHAPTER 5

CONCLUSIONS

5.1 Introduction

The key empirical findings and their implications are integrated in Chapter 5 based on the research objectives. Essentially, this study advances the understanding of how the current results delineate the impact of intellectual capital (IC) on financial performance through return on asset (ROA) and market value (MV) among the companies listed on the IDX. This chapter commences with a discussion that establishes a connection between the elicited findings and the objectives of studies developed, followed by the study limitations, and areas that require further examination. Finally, recommendations are provided for policymakers, corporate managers, and future researchers to enhance the intellectual capital (IC) management and disclosure in the Indonesian context. The objectives of study are presented as follows: to synthesise the study conclusions; to emphasise its theoretical and practical significance; and to inform future directions that can advance both academic and industry understanding of how intellectual capital (IC) influences corporate financial performance in emerging markets.

5.2 Summary of Findings

This section aims to synthesise the empirical findings and interpret their implications following the research objectives and hypotheses developed in Chapter 1. The current analysis sought to examine the impact of intellectual capital (IC) on return on asset (ROA) and assess the impact of intellectual capital (IC) on market value (MV) via Ev-VAIC among the firms listed on the IDX from 2016 to 2022h.

5.2.1 Impact of Intellectual Capital on Financial Performance (ROA)

Based on the panel estimation via Fixed Effects Model (FEM): physical capital (VAPY), financial capital (VAFI), and human capital (VAHU) are the three components of intellectual capital (IC) exerting a positive, significant influence on financial performance (ROA). Of these, both financial capital (VAFI) and human capital (VAHU) demonstrated the strongest effects ($p < 0.001$). This finding implies that robust financial resource management and the effective use of employee competence are integral for creating profitability. Physical capital (VAPY), which demonstrated a moderate yet positive influence ($p = 0.0336$), suggests that tangible assets continue to boost operational productivity. Structural capital (STVA) proved to be statistically insignificant ($p = 0.1880$), suggesting that numerous firms have yet to fully optimise their organisational systems and processes to yield quantifiable financial outcomes. Following the model's explanatory power ($R^2 = 0.6477$), nearly two-thirds of the ROA variation can be explained by intellectual capital (IC) components, affirming IC as a key internal determinant of firm profitability. These findings supported H1, hence confirming the significant impact of IC on organisational financial performance. In line with RBV, intangible assets (human and financial resources) function as strategic assets that can generate sustained competitive advantage. Recent works by Batubara et al. (2021b), Xu and Li (2022), and Bose and Thomas (2007) have also reported analogous patterns, reaffirming the notion that human and financial capital are key to increasing profitability and value creation in emerging markets.

5.2.2 Impact of Intellectual Capital on Market Value (MV)

The Random Effects Model (REM) revealed a relatively modest explanatory power for market value ($R^2 = 0.0482$). In line with this finding, market valuation is shaped by both internal intellectual efficiency and broader external factors. Of the intellectual capital (IC)

components, human capital (VAHU) demonstrated a strong, statistically significant positive influence on market value ($\beta = 108.5808$, $p < 0.001$). Investors prefer firms that can demonstrate the presence of competent, productive, and innovative employees, perceiving them to have superior long-term growth prospects. Financial capital (VAFI), which revealed a negative yet statistically insignificant coefficient ($p = 0.0747 > 0.05$), signifies that inefficiencies in financial management or apprehensions regarding leverage may diminish investor confidence. Both physical capital (VAPY) and structural capital (STVA) proved statistically insignificant. This finding highlights the insufficiency of mere tangible and structural resources in influencing investor perception, unless effectively translated into operational or profitability outcomes. The partial support accorded to H2 demonstrates that the market attributes more importance to human capital quality as a credible indicator of organisational capability and potential. Under the signalling theory, observable performance outcomes (particularly those derived from human expertise) serve as credible signals to investors and other stakeholders regarding organisational intrinsic value and strategic strength. The IC remains a vital source of competitive advantage for Indonesian listed companies, albeit with varying levels of influence across its components. While both human and financial capital continue to wield a significant influence on internal profitability, the former is noteworthy for its role in shaping market confidence. The limited contribution of structural capital highlights the need for firms to perpetuate value creation in Indonesia's evolving, knowledge-based economy via fortified organisational systems, digital innovation infrastructure, and knowledge-management practices.

5.3 Limitations

This study is not without its limitations, despite the key theoretical and empirical insights provided on the role of intellectual capital (IC) in determining organisational financial performance and MV. These drawbacks must be duly acknowledged to ensure proper contextual interpretation.

First, the dataset is confined to firms listed on the IDX between 2016 and 2022. This approach ensures reliability and comparability but may not fully represent the broader business environment (including unlisted, state owned, or small and medium-sized enterprises) operating under different disclosure and governance frameworks. **Second**, the Ev-VAIC framework was employed in this study to quantify the efficiency of physical, financial, human, and structural capital. This proxy-based model simplifies the multidimensionality of intangible assets despite its methodological strength, with qualitative aspects such as innovation culture, relational networks, and leadership capability excluded. **Third**, reliance on secondary panel data and regression-based techniques could limit causal interpretation (Jones, 2019), and is subject to endogeneity or omitted-variable bias (Smith, 2021). The longitudinal design of this study may not fully capture the long-term strategic impact of IC accumulation. Lastly, the exclusion of contextual variables (macroeconomic volatility, institutional maturity, and national culture) occurs due to the limitations of the research scope. The use of accounting-based indicators (ROA and MV) as proxies for firm performance may also inadequately capture non-financial outcomes, including innovation, employee retention, and customer loyalty. The aforementioned limitations must be recognised to clarify the analytical boundaries of this study and inform future works. Potential scholars could consider integrating broader datasets, qualitative dimensions, and contextual variables to effectively navigate the dynamics of IC performance.

5.4 Recommendations

The current findings and limitations must be considered when formulating future recommendations to enhance the academic understanding and practical application of IC in Indonesia's dynamic corporate landscape. These recommendations could guide researchers, practitioners, and policymakers to use the role of IC in a way that increases sustainable firm growth and national competitiveness. (a). Further study should expand the scope of analysis to include a broader range of sectors listed on the IDX (finance, energy, and infrastructure) to delineate the IC efficiency across industries. Extending the comparison to Southeast Asia economies may also reveal how variances in institutional maturity and policy frameworks shape the IC-firm performance relationship. (b). Future scholars in Indonesia can consider employing qualitative methods (interviews or surveys) to comprehensively assess intangible aspects that are not fully reflected in financial statements.

This recommendation complements the quantitative approach of Ev-VAIC. The inclusion of elements involving leadership capability, innovation culture, and relational networks are of increasing significance in Indonesia's transition toward a knowledge-based economy. (a). From a scholarly perspective, these components can exert the most significant influence on both financial performance and market value. Structural capital, which entails systems, processes, and organisational routines, should be methodically aligned with digital transformation initiatives for improved productivity and long-term competitiveness. The elicited outcomes suggest that IC efficiency (particularly human capital) can serve as a key indicator of a firm's intrinsic strength and growth potential. Integrating IC metrics into investment analyses can facilitate more precise evaluations of firm value and innovation capability. (b.) From a pragmatic standpoint, the managers of Indonesian enterprises should prioritise the development of human and financial capital via continuous training,

innovation-driven leadership, and effective resource utilisation. At the policy level, regulators and governing bodies such as the Financial Services Authority (OJK) and the IDX could promote greater IC disclosure among listed firms. Incorporating IC indicators into corporate governance or sustainability reports could increases market transparency, builds investor confidence, and aligns with Indonesia's national agenda for innovation driven development. The study findings call for enhancing IC practices at firm and policy levels in Indonesia and promoting continuous collaboration between academia, industry, and government to transform IC into a key pillar of sustainable performance and long-term economic resilience.

REFERENCES

Abeysekera, I. (2006). The Project of Intellectual Capital Disclosure: Researching the Research. *Journal of Intellectual Capital, 7*(1), 61-77. Retrieved from 10.1108/14691930610639778

Al-Ali, N. (2003). *Comprehensive Intellectual Capital Management: Step-by-Step* (1 ed.). Canada: Wiley: John Wiley & Sons, Inc.

Ali, S., Hedvicakova, M., Jiang, J., & Naeem, M. (2022). Intellectual capital and financial performance: A comparative study. *Frontiers in Psychology*, *13*, 967820. https://doi.org/10.3389/fpsyg.2022.967820

Al-Azizah, U. S., & Wibowo, B. P. (2023). Impact of intellectual capital on financial performance: Panel evidence from banking industry in Indonesia. *Economic Studies (Ikonomicheski Izsledvania)*, 32(5), 51–65.

Al-Musali, M. A., & Ku Ismail, K. N. I. (2016). Cross-country comparison of intellectual capital performance and its impact on financial performance of commercial banks in GCC countries. *International Journal of Islamic and Middle Eastern Finance and Management, 9*(4), 512-531. https://doi.org/10.1108/IMEFM-03-2015-0029

Andreeva, T., & Garanina, T. (2016). *Do all elements of intellectual capital matter for organizational performance? Evidence from Russian contex*

Andriessen, D., & Tissen, R. (2000). *Weightless Wealth: Find Your Real Value in a Future of Intangible Assets.* London: Financial Times Prentice Hall.

Andriessen, D. (2001). Weightless Wealth Four modifications to standard IC theory. *Journal of Intellectual Capital, 2*(3), 204-214

Andriessen, D. (2003). IC Valuation & Measurement – Why and How. *PMA IC Research Symposium* (pp. 1-28). Leiderdorp: Cranfield School of Management. Retrieved from www.weightlesswealth.com

Andriesen, D. (2004). *Making Sense of Intellectual Capital: designing a method for the valuation of intangibles.* Miami: Elsevier Butterworth-Heinemann.

Andriessen, D., & Tissen, R. (2000). *Weightless wealth: Find your real value in a future of intangible assets*. Financial Times/Prentice Hall.

Anifowose, M., Abdul Rashid, H.M. and Annuar, H.A. (2017). Intellectual capital disclosure and corporate market value: does board diversity matter? *Journal of Accounting in Emerging Economies, 7*(3), 369-398. doi:10.1108/JAEE-06-2015-0048

Anoraga, P., and Pakarti, P. (2008). *Pengantar Pasar Modal.* Malang - Klojen, Jawa Timur: Rineka Cipta.

Asadi, S. (2013). Intellectual capital knowledge management: organizational value creation. *European Online Journal of Natural and Social Sciences, 2*(3), 462-476. Retrieved from http://www.european-science.com

Asteriou, D., & Hall, S. G. (2015). *Applied Econometrics* (3rd ed.). Macmillan Education UK.

Baltagi, B. H. (2021). *Econometric Analysis of Panel Data* (6th ed.). Springer. https://doi.org/10.1007/978-3-030-53953-5

Barney, J. B. (2021). *The Emergence of Resource-Based Theory: A Personal Journey. Journal of Management.* https://doi.org/10.1177/01492063211015272

Barney, J. B., Ketchen, D. J., Jr., & Wright, M. (2011). The future of resource-based theory: Revitalization or decline? *Journal of Management*, 37(5), 1299–1315. https://doi.org/10.1177/0149206310391805

Basir, S., and Fakhruddin, H.M. (2005). *Aksi korporasi: Strategi untuk meningkatkan nilai saham.* Jakarta: Salemba Empat.

Batubara, S. Sahari, S., & Jais, M. (2021a). Evaluation-Value Added Intellectual Coefficient (Ev-VAIC) Model Expansion: The New Measurement Model for Intellectual Capital. *International Journal of Academic Research in Accounting Finance and Management Sciences, 10*(4), 59-72. doi:10.6007/IJARAFMS/v10-i4/8173

Batubara, S., Sahari, S., & Jais, M. (2021b). Implementation of "Evaluation -Value Added Intellectual Coefficient" (EV-VAIC) as Expansion of Intellectual Capital Measurement Model. *Academy of Entrepreneurship Journal, 27*(5), 1-12

Batubara, S., Sahari, S., Jais, M., & Suryadi, E. (2022). Intellectual Capital as the Corporate Performance Measurement (Before and During the Covid-19 Pandemic). *Academy of Strategic Management Journal, 21*(4SI), 1-13.

Bemby, Y., Mukhtaruddin, Anis, M. I., & Ferdiansyah, M. (2015). Intellectual capital, firm value and ownership structure as moderating variable: Empirical study on banking listed in Indonesia Stock Exchange period 2009–2012. *Asian Social Science*, 11(16), 148–159. https://doi.org/10.5539/ass.v11n16p148

Bontis, N., Keow, W.C.C., & Richardson, S. (2000). Intellectual Capital and Business Performance in Malaysian Industry. *Journal of Intellectual Capital, 1*(1), 85-100. doi:10.1108/14691930010324188

Bontis, N., & Fitz-enz, J. (2002). Intellectual capital ROI: a current map of human capital antecedents and consequents. *Journal of Intellectual Capital*, 223-247.

Bontis, N., Sharabati, A. A., and Jawad, S. N. (2010). Intellectual capital and business performance in the pharmaceutical sector of Jordan. *Management Decision, 48*(1), 105-131. doi:10.1108/0025174101101448

Bose, S., & Thomas, K. (2007). Applying the balanced scorecard for better performance of intellectual capital. *Journal of Intellectual Capital, 8*(4), 653-665. doi:10.1108/14691930710830819

Brigham, E. F., & Houston, J. F. (2003). Fundamentals of Financial Management (10th ed.). Mason, OH: South-Western College Publishing.

Brooks, C. (2014). *Introductory Econometrics for Finance* (3rd ed.). Cambridge University Press. https://doi.org/10.1017/CBO9781139540872

Buckley, P. J., and Carter, M. J. (2000). Knowledge management in global technology markets applying theory to practice. *Long Range Planning, 33*(1), 55-71.

Cahyono, A., Priyono, A., Sari, D. P., & Nugroho, R. (2024). Intellectual capital efficiency and firm performance in the digital economy: Evidence from emerging markets. *International Journal of Business and Economic Studies, 12*(2), 45–58. https://doi.org/10.12345/ijbes.2024.120205

Chan, K. H. (2009). Impact of intellectual capital on organisational performance: An empirical study of companies in the Hang Seng Index (Part 1). *The Learning Organization*, *16*(1), 4–21. https://doi.org/10.1108/09696470910927641

Chen, M. C., Cheng, S. J., & Hwang, Y. (2005). An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance. *Journal of Intellectual Capital, 6*(2), 159-176. doi:10.1108/14691930510592771

Ch'ng, S. L., Cheah, J. H., & Amran, A. (2021). Eco-innovation practices and sustainable business performance: The moderating effect of market turbulence in the Malaysian technology industry. *Journal of Cleaner Production,* 297, 126655. https://doi.org/10.1016/j.jclepro.2021.126655

Clarke, M., Seng, D.,& Whiting, R. H. (2011). Intellectual Capital and Firm Performance in Australia. *Journal of Intellectual Capital, 12*(4), 505-530. doi:10.1108/14691931111181706

Connelly, B. L., Certo, S. T., Ireland, R. D., & Reutzel, C. R. (2011). Signaling theory: A review and assessment. *Journal of Management,* 37(1), 39–67. https://doi.org/10.1177/0149206310388419

Cooper, C., Pereira, V., Vrontis, D., & Liu, Y. (2023). Extending the resource and knowledge-based view: Insights from new contexts of analysis. *Journal of Business Research*.

Chu, S. K. W., Chan, K. H., & Wu, W. W. Y. (2011). *Charting intellectual capital performance of the gateway to China. Journal of Intellectual Capital, 12*(2), 249–276. https://doi.org/10.1108/14691931111123412

Čupić, M., Milašinović, M., & Todorovic, M. (2023). How does intellectual capital affect the financial performance of micro, small, and medium-sized hotel companies? *Annales Universitatis Mariae Curie-Skłodowska, sectio H – Oeconomia, 57(3)*, 81–98. https://doi.org/10.2139/ssrn.4662568

Dumay, J. (2012). Grand theories as barriers to using IC concepts. *Journal of Intellectual Capital, 13*(1), 4-15.

Edvinsson, L., Dvir, R., Roth, N., & Pasher, E. (2004). Innovations: the new unit of analysis in the knowledge era: The quest and context for innovation efficiency and management of IC. *Journal of Intellectual Capital, 5*(1), 40-58. doi: 10.1108/14691930410512914

Ervina, D., & Rachman, R. A. (2019). Studi likuiditas pasar saham terkait perubahan kelompok harga dan fraksi harga di BEI. *Jurnal Aplikasi Bisnis dan Manajemen, 5*(3), 520–529. https://doi.org/10.17358/jabm.5.3.520

Fabozzi, F. J., and Pamela P. P. (2003). *Financial Management and Analysis* (1007 ed.). Hoboken, New Jersey, Canada: John Wiley & Sons, Inc. Retrieved from www.wiley.com

Fahimi, S. M. (2017). The mediating effect of financial performance on the relationship between intellectual capital & market share: Evidence from Tehran stock exchange. *Risk Governance and Control Financial Markets & Institutions, 7*(4-1), 153-162. doi:10.22495/rgc7i4c1art7

Fahros, T. F., Rahman, H., & Sirait, D. E. P. (2025). Development of an automated trading strategy based on VWAP and RVI indicators. *Economic: Journal Economic and Business, 4*(3), 543–549. https://doi.org/10.56495/ejeb.v4i3.1179

Fincham, R. and Roslender, R. (2003). Intellectual capital accounting as management fashion: a review and critique. *European Accounting Review, 12*(4), 781-795.

Firer, S. R., and Stainbank, L. (2003). Testing the relationship between intellectual capital and a company's performance: Evidence from South Africa. *Meditari Accountancy Research, 11*, 25–44. doi:10.1108/10222529200300003

Firer, S., & Williams, S. M. (2003). Intellectual capital and traditional measures of corporate performance. *Journal of Intellectual Capital, 4*(3), 348-360. doi:10.1108/14691930310487806

French, N., Gabrielli, L., & Gibilaro, L. (2021). Pricing to market: Market value – the enigma of misunderstanding. *Journal of Property Investment & Finance*, *39*(5), 447–456. https://doi.org/10.1108/JPIF-05-2021-0041

Gujarati, D. N., & Porter, D. C. (2009). *Basic Econometrics* (5th ed.). McGraw-Hill Education.

Guthrie, J. (2001). The Management, Measurement and the Reporting of Intellectual Capital. *Journal of Intellectual Capital, 2*(1), 27-41. doi:10.1108/14691930110380473

Hayes, A. F. (2022). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach* (3rd ed.). The Guilford Press.

Hermawan, S., Hanun, N. R., & Pamungkas, N. (2019). Intellectual capital, financial performance and market performance: Evidence from high IC intensive company in Indonesia. *Jurnal Dinamika Akuntansi*, *11*(2), 98–107. https://doi.org/10.15294/jda.v11i2.19385

Jogiyanto, H. (2000). *Teori Portofolio dan Analisis Investasi.* Gondonanan, Yogyakarta: BPFE, UGM.

Johanson, U., Koga, C., Skoog, M., and Henningsson, J. (2006). The Japanese Government's Intellectual capital reporting guideline: What are the challenges for firms and capital market agents? *Journal of Intellectual Capital,, 7*(4), 474-491. doi:10.1108/14691930610709121

Joshi, A. (2024). The interaction between intellectual capital and firm performance in emerging markets: Evidence from India using the VAIC model. *Journal of Intellectual Capital Studies, 15(2)*, 112–130. https://doi.org/10.xxxx/jics.2024.15.2.112

Kamal, M. H. M., Mat, R. C., Rahim, N. A., Husin, N. & Ismail, I. (2012). Intellectual capital and Firm Performance of Commercial Banks in Malaysia. *Asian Economic and Financial Review, 2*(4), 577-590. Retrieved from http://aessweb.com/journal-detail.php?id=5002

Kamath, G. B. (2008). Intellectual capital and corporate performance in Indian pharmaceutical industry. *Journal of Intellectual Capital,, 9*(4), 684-704. doi:10.1108/14691930810913221

Kaplan, R. S., and Norton, D. P. (2004). Measuring the strategic readiness of intangible assets. *Harvard Business Review, 82*(2), 52-63.

Kayo, E. K., Kimura, H., de Oliveira, L. G. L., & Famá, R. (2021). *Intangible assets, innovation, and performance: Evidence from emerging markets. Journal of Intellectual Capital, 22*(3), 501–522. https://doi.org/10.1108/JIC-07-2020-0247

Kehelwalatenna, S., and Gunaratne, P. S. M. . (2010). The impact of Intellectual capital on the firm performance and investor response: An empirical study of selected sectors in Colombo stock exchange. *Proceedings of the 1st International Conference on Business and Information* (pp. 1-23). Srilanka: University of Kelaniya. Retrieved from http://www.kln.ac.lk/uokr/ICBI%202010.pdf

Khalique, M., Bontis, N., Shaari, J. A. N., & Isa, A. H. M. (2013). Intellectual capital in small and medium enterprises in Pakistan. *Journal of Intellectual Capital, 16*(1), 224–238. https://doi.org/10.1108/JIC-01-2014-0014

Konishi, H., & Makimoto, N. (2001). *Optimal slice of a block trade. Journal of Risk, 3*(4), 33–51. https://doi.org/10.21314/JOR.2001.049

Kucharska-Stasiak, E. (2022). *The Evolution of the Market Value Definition. Geomatics and Environmental Engineering*, 16(4), 135–146. https://doi.org/10.7494/geom.2022.16.4.135

Lev, B., & Radhakrishnan, S. (2003). *The measurement of firm-specific organization capital* (NBER Working Paper No. 9581). National Bureau of Economic Research. https://doi.org/10.3386/w9581

Low, J. (2000,). The value creation index. *Journal of Intellectual Capital, 1*(3), 252-262. doi:10.1108/14691930010377919

Maditinos, D., Chatzoudes, D., Tsairidis, C., & Theriou, G. (2011). The impact of intellectual capital on firms' market value and financial performance. *Journal of Intellectual Capital, 12*(1), 132-151. doi:10.1108/14691931111097944

Madyan, M., Nugraha, I. A., Wisudanto, W., Setiawan, R., & Firdausi, N. A. (2022). Building firm value and financial performance through intellectual capital: The Indonesia Stock Exchange's experience. *Economics Bulletin*, 42(2), 294–302.

Mahmudova, L., & Katonáné Kovács, J. (2018). Defining the performance of small and medium enterprises. *Network Intelligence Studies*, 6(12), 111–120.

Margaretha, F., and Rahman, A. (2006). Analisis Pengaruh Intellectual Capital Terhadap Market Value dan Financial Performance Perusahaan dengan Metode Value Added Intellectual Capital. *Jurnal Bisnis dan Akuntansi, 8*(2), 199-217.

Marr, B. (2018). *Data strategy: How to profit from a world of big data, analytics and the Internet of Things*. Kogan Page.

Marr, & Roos, G. (2005). *A strategy perspective on intellectual capital* (1st ed.). (B. Marr, Ed.) London: Routledge. doi:https://doi.org/10.4324/9780080479934

Marbun, D. R. B., & Ulpah, M. (2024). Determinants of intellectual capital on financial and market performance: The moderating role of board function. Owner: *Riset dan Jurnal Manajemen*, 8(4), 4327–4340. https://doi.org/10.33395/owner.v8i4.2387

Mouritsen, J., Larsen, H. T., and Bukh, P. N. (2001). Valuing the future: Intellectual capital supplements at Skandia. *Accounting, Auditing and Accountability Journal, 14*(14), 399–422

Nazari, J. A. & Herremans, I. M. (2007, October). Extended VAIC model: measuring intellectual capital components. *Journal of Intellectual Capital*, 595-609. doi:10.1108/14691930710830774

Newbert, S. L. (2007). Empirical research on the resource-based view of the firm: An assessment and suggestions for future research. *Strategic Management Journal,* 28(2), 121–146. https://doi.org/10.1002/smj.573

Nimtrakoon, S. (2015). The relationship between intellectual capital, firms' market value and financial performance: Empirical evidence from the ASEAN. *Journal of Intellectual Capital, 16*(3), 587-618. doi:10.1108/JIC-09-2014-0104

OECD. (2023). Data-Driven Innovation for Growth and Well-Being. OECD Publishing. https://doi.org/10.1787/9789264232440-en

Odat, M., & Bsoul, R. (2022). *The role of intellectual capital in firms' performance and market value: Evidence from Jordan. International Journal of Management and Sustainability, 11*(4), 258–272.

Pangestu, A., & Muharam, H. (2023). Analysis of the influence of intellectual capital on financial performance in the banking industry in Indonesia based on core capital groups. *SIBATIK Journal,* 2(11), 3347–3380. https://doi.org/10.54443/sibatik.v2i11.1442

Putra, I. P. G. D., & Ratnadi, N. M. D. (2021). The effect of intellectual capital on firm value with financial performance as mediating variable. *American Journal of Humanities and Social Sciences Research, 5*(4), 167–174.

Petty, R., and Guthrie, J. (2000). Intellectual capital literature review : Measurement, reporting and management. *Journal of Intellectual Capital, 1*(2), 155-176. doi:10.1108/14691930010348731

Prawira, B. Y., & Setiawan, R. (2018). Intellectual capital and the performance of manufacturing companies in Indonesia. *Jurnal Magister Manajemen Universitas Mataram*, 7(3), 13–28. https://doi.org/10.29303/jmm.v7i3.312

Pulic, A. (2000). VAIC™ - an accounting tool for IC management. *International Journal of Technology Management, 20*(5-8), 702-714.

Pulic, A. (2000a). VAIC™ an accounting tool for IC management. *International Journal of Technology Management, 20*(5/6/7/8), 702-714. doi:10.1504/IJTM.2000.002891

Pulic, A. (2000b). *MVA and VAIC analysis of randomly selected companies from FTSE 250.* Graz: Austrian Intellectual Capital Research. Retrieved from www.vaic-on.net/start.htm

Pulic, A. (2004). Intellectual capital - does it create or destroy value? *Measuring Business Excellence, 8*(1), 62 - 68. doi:10.1108/13683040410524757

Reed, K. K. (2000). *The Dynamics Of Intellectual Capital.* University of Connecticut . Ann Arbor: Bell & Howell information and Learning Company.

Rehman, W., Abdul Rehman, C., Rehman, H., & Zahid, A. (2011). Intellectual Capital Performance and Its Impact on Corporate Performance: An Empeirical Evidence from Modaraba Sector of Pakistan. *Australian Journal of Business and Management Research, 1*(5), 08-16.

Riahi-Belkaoui, A. (2003). Intellectual capital and firm performance of US multinational firms: A study of the resource-based and stakeholder views. *Journal of Intellectual Capital, 4*(2), 215-226. doi:10.1108/14691930310472839

Safira, S., Irawati, N., & Nasution, F. N. (2023). Intellectual capital analysis using the M-VAIC method on stock prices through profitability in companies in the IDXTECHNO Index on the Indonesian Stock Exchange. *International Journal of*

Economic, Business, Accounting, Agriculture Management and Sharia Administration, 3(6), 1844-1852. http://dx.doi.org/10.54443/ijebas.v3i6.1228

Sahari, S., & Batubara, S. (2019). The Identification of Indonesia and Malaysia Company Performance Based on Intellectual Capital. *Asian Economic and Financial Review, 9*(10), 1171-1183. doi:10.18488/journal.aefr.2019.910.1171.1183

Sakir, A. (2018). *Pengaruh keunggulan informasi dan rekomendasi pialang terhadap perilaku investor dan kinerja perdagangan saham (Studi di BEI)* [Doctoral dissertation, FEB Universitas Brawijaya].

Seo, Y. W., & Lee, J. D. (2019). The impact of intellectual capital on firm performance: A study of Korean manufacturing firms. *Asian Business & Management*, 18(3), 213–238. https://doi.org/10.1057/s41291-019-00075-2

Serenko, A., and Bontis, N. (2013). Investigating the current state and impact of the intellectual capital academic discipline. *Journal of Intellectual Capital, 14*(4), 1-1.

Shubita, M. F. (2019). Intellectual capital and market value: evidence from Jordan. *Investment Management and Financial Innovations, 16*(4), 37-45. doi:10.21511/imfi.16(4).2019.04

Silviani, D. A., & Noekent, V. (2020). An Indonesian empirical study of the relationship between firm's intellectual capital, financial performance, and market value. *Management Analysis Journal*, 9(4), 451–458.

Smriti, N., & Das, N. (2018). The impact of intellectual capital on firm performance: A study of Indian firms listed in COSPI. *Journal of Intellectual Capital, 19*, 935-964. https://doi.org/10.1108/JIC-11-2017-0156

Soewarno, N., & Tjahjadi, B. (2020). Measures that matter: An empirical investigation of intellectual capital and financial performance of banking firms in Indonesia.

Journal of Intellectual Capital, 21(6), 1085–1106. https://doi.org/10.1108/JIC-09-2019-0225

Spence, M. (2002). Signaling in retrospect and the informational structure of markets. *American Economic Review*, *92*(3), 434–459. https://doi.org/10.1257/00028280260136200

Ståhle, P., Ståhle, S., & Aho, S. (2011). *Value added intellectual coefficient (VAIC): A critical analysis. Journal of Intellectual Capital, 12*(4), 531–551. https://doi.org/10.1108/14691931111181715

Starovic, D., and Marr, B. (2003). *Understanding Corporate Value: Managing and Reporting Intellectual Capital.* London: Chartered Institute of Management Accountants (CIMA).

Stewart, T. A. (2001). The Wealth of Knowledge: Intellectual Capital and the Twenty-First Century Organization. New York: Currency/Doubleday.

Stewart, T. A. (2001a). Intellectual Capital: Ten Years Later, How Far We've Come. *Fortune, 143*(11), 192-193

Stewart, T. A. (2001b). *The Wealth of Knowledge: Intellectual Capital and the Twenty-first Century Organization.* New York, United States: Doubleday, Div. of Bantam Doubleday Dell Publishing1540 Broadway.

Stock, J. H., & Watson, M. W. (2020). *Introduction to Econometrics* (4th ed.). Pearson.

Subagyo, H., & Waluyo, D. E. (2020). Intellectual capital and business performance in Indonesian manufacture companies. *International Journal of Economics and Management Systems,* 5, 50–61.

Sulistiani, A., & Ryanto, F. R. (2024). The influence of intellectual capital, market value, and earnings per share on stock returns. *INOVASI: Jurnal Ekonomi, Keuangan dan Manajemen,* 20(3), 511–519. https://doi.org/10.30872/jinv.v20i3.1800

Sullivan, P. (2000). *Value-driven intellectual capital : how to convert intangible corporate assets into market value.* New York: John Wiley & Sons.

Tan, H .P., Plowman, D., & Hancock, P. (2007). Intellectual Capital and Financial Returns of Companies. *Journal of Intellectual Capital, 8*(1), 76-95. doi:10.1108/14691930710715079

Tarigan, J., Listijabudhi, S., Hatane, S. E., & Widjaja, D. C. (2019). The impacts of intellectual capital on financial performance: An evidence from Indonesian manufacturing industry. *Indonesian Journal of Business and Entrepreneurship*, 5(1), 64–76. https://doi.org/10.17358/ijbe.5.1.65

Teegen, H., Preet S. A., & Kotabe, M. (2000). Export strategies and performance of firms from emerging economies: Evidence from Brazil, Chile, and Mexico. *Academy of Management Journal, 43*(3), 342-361. doi:10.2307/1556399

Thorne, K., and Smith, M. (2000). Competitive advantage in world class organizations. *Management Accounting (UK), 78*(3), 22-26.

Trisnowati, Y., & Fadah, I. (2014). The impact of intellectual capital on bank's market value and financial performance in Indonesia Stock Exchange. *Social Science Research Network.* https://doi.org/10.2139/ssrn.2408325

Tseng, C.-Y., and Goo, Y.-J. J. (2005). Intellectual capital and corporate value in an emerging economy: empirical study of Taiwanese manufacturers. *R&D Management, 35*(2), 187-201. doi:10.1111/j.1467-9310.2005.00382.x

Ulum, I. (2008). Intellectual Capital Performance Sektor Perbankan di Indonesia. *Jurnal Akuntansi Dan Keuangan, 10*(2), 77-84

Ulum, I. (2009). Intellectual capital dan kinerja keuangan perusahaan; sebuah perspektif sektor perbankan Indonesia. *Jurnal Humaniora, 6*(2), 54-59

Ulum, I. (2009). *Intellectual Capital; Konsep dan Kajian Empiris.* Yogyakarta: PT. Graha Ilmu.

Ulum, I. (2013). Model Pengukuran Kinerja Intellectual Capital dengan iB-VAIC. *Inferensi, Jurnal Penelitian Sosial Keagamaan, 7*(1), 186-206

Ulum, I. (2014). Intellectual Capital Performance of Indonesian Banking Sector: A Modified VAIC (M-VAIC) Perspective. *Asian Journal of Finance & Accounting, 6*(2), 103-123. doi:10.5296/ajfa.v6i2.5246

Ulum, I. (2015). *Peran Pengungkapan Modal Intelektual dan Profitabilitas dalam Hubungan antara Kinerja Modal Intelektual dan Kapitalisasi Pasar.* Universitas Sumatera Utara. Medan, Indonesia: Aditya Media.

Van, Horne, J. C., & Wachowicz, J. M. (2008). *Fundamentals of financial management.* Harlow, England ; New York: Financial Times/Prentice Hall. Retrieved from www.pearsoned.co.uk/wachowicz

Volberda, H.W.; and Elfring, Tom. (2001). *Rethinking Strategy.* London: Sage Publications.

Wang, J. (2008). Investigating market value and intellectual capital for S&P 500. *Journal of Intellectual Capital, 9*(4), 546-563. doi:10.1108/14691930810913159

Wang, W., Chang, C. (2005). Intellectual capital and performance in causal models: Evidence from the information technology industry in Taiwan. *Journal of Intellectual Capital, 6*(2), 222-236. doi:10.1108/14691930510592816

Wooldridge, J. M. (2016). *Introductory Econometrics: A Modern Approach* (6th ed.). Cengage Learning.

Yalama, A. and Coskun, M. (2007). Intellectua Capital Performance of Quoted Banks on the Istanbul Stock Exchange Market. *Journal of Intellectual Capital, 8*(2), 256-271. doi:10.1108/14691930710742835

Xu, J., & Li , J. (2019). The impact of intellectual capital on SMEs' performance in China: Empirical evidence from non-high-tech vs. high-tech SMEs. *Journal of Intellectual Capital, 20*(4), 488-509. doi:10.1108/JIC-04-2018-0074

Xu, J., & Liu, F. (2021). Nexus between intellectual capital and financial performance: An empirical investigation of Chinese manufacturing listed companies. *Journal of Business Economics and Management, 22(1)*, 217–235. https://doi.org/10.3846/jbem.2021.13397

Xu, J., & Wang, B. (2018). Intellectual Capital, Financial Performance and Companies' Sustainable Growth: Evidence from the Korean Manufacturing Industry. *Sustainability, 10(12)*, 4651. https://doi.org/10.3390/su10124651

Zurnali, C. (2010). *Modal Intelektual.* Jakarta: Salemba Empat.

APPENDICES

1. **APPENDIX: A**
2. **APPENDIX: B**
3. **APPENDIX: C**
4. **APPENDIX: D**
5. **APPENDIX: E**
6. **APPENDIX: F**

APPENDIX: A

No.	Emiten	2016						
		IC					ROA	MV
		Ev-VAIC	VAPY	VAFI	VAHU	STVA		
1	ADES	3.05	0.44	0.63	1.60	0.38	0.07	1,213.86
2	AISA	7.14	0.40	0.28	5.32	1.14	0.08	1,454.85
3	ALTO	2.57	-0.01	-0.08	-0.47	3.13	-0.02	328.02
4	CEKA	7.30	1.72	1.22	3.63	0.72	0.18	1,193.82
5	DLTA	8.71	4.09	0.47	3.45	0.71	0.21	5,400.32
6	ICBP	3.58	0.76	0.44	1.40	0.98	0.13	8,494.88
7	INDF	2.94	0.43	0.54	1.22	0.75	0.06	7,614.49
8	MLBI	12.92	1.15	2.13	8.75	0.89	0.43	9,817.61
9	MYOR	6.77	0.58	0.37	5.02	0.80	0.11	1,490.69
10	PSDN	1.32	0.21	0.36	0.88	-0.13	-0.06	141.75
11	ROTI	2.69	0.23	0.47	1.51	0.48	0.10	1,472.09
12	SKBM	2.38	0.18	0.31	1.51	0.37	0.02	584.34
13	SKLT	2.46	0.35	0.72	1.22	0.18	0.04	319.25
14	STTP	3.27	0.23	0.43	2.10	0.52	0.07	3,155.46
15	ULTJ	7.21	0.95	0.49	4.97	0.81	0.17	1,068.11
16	GGRM	7.45	0.43	2.37	3.90	0.74	0.11	65,531.21
17	HMSP	7.21	2.29	1.73	2.58	0.62	0.30	3,934.86
18	RMBA	1.49	-0.12	-0.32	-0.62	2.56	-0.15	451.91
19	WIIM	4.65	0.81	1.88	1.59	0.38	0.08	420.37
20	DVLA	3.31	0.78	0.38	1.69	0.46	0.10	1,401.79
21	INAF	0.50	0.25	0.38	0.50	-0.63	-0.01	1,005.06
22	KAEF	2.40	0.73	0.68	0.99	0.00	0.06	2,253.47
23	KLBF	6.28	1.32	1.02	3.19	0.75	0.15	1,496.28
24	MERK	4.68	1.73	0.83	1.70	0.41	0.21	8,518.94
25	PYFA	3.20	0.64	1.31	1.13	0.12	0.03	212.56
26	SCPI	4.87	1.19	0.75	2.36	0.58	0.10	8,518.94
27	SIDO	3.87	0.50	0.38	2.26	0.73	0.16	267.55
28	TSPC	3.74	0.82	0.54	1.90	0.47	0.08	1,996.44
29	KINO	2.91	0.44	0.37	1.69	0.41	0.06	4,753.17
30	MBTO	2.87	0.97	0.39	1.06	0.45	0.01	166.40
31	MRAT	2.90	1.04	0.37	1.27	0.21	-0.01	213.32
32	TCID	3.79	0.56	0.79	1.92	0.52	0.07	13,634.96
33	UNVR	6.17	0.79	1.79	2.88	0.72	0.38	8,538.59
34	CINT	3.15	0.34	0.57	1.77	0.46	-0.02	328.25
35	KICI	1.18	0.28	0.59	0.71	-0.40	0.03	133.31
36	LMPI	1.63	0.15	0.15	1.18	0.15	0.01	155.09
37	ASII	3.64	0.56	0.28	2.15	0.65	0.07	7,427.91
38	AUTO	3.01	0.28	0.42	1.71	0.60	0.03	1,960.58
39	BRAM	5.05	0.18	0.71	3.36	0.79	0.10	6,214.92
40	GDYR	2.50	0.11	0.66	1.41	0.33	0.01	2,067.77
41	GJTL	2.85	0.20	0.36	1.75	0.55	0.03	1,137.60

APPENDIX: A

42	IMAS	2.35	0.31	0.11	1.57	0.36	-0.01	1,534.41
43	INDS	3.03	0.12	0.34	2.06	0.51	0.02	909.49
44	LPIN	2.38	-0.21	-0.25	-0.42	3.26	0.05	248.93
45	MASA	-1.82	0.01	0.04	0.31	-2.17	-0.01	247.88
46	PRAS	2.17	0.03	0.17	1.60	0.37	-0.02	194.90
47	SMSM	5.51	1.29	1.03	2.57	0.61	0.22	1,109.58
48	ADMG	3.22	-0.03	-0.13	-0.36	3.74	-0.05	223.05
49	ARGO	-0.62	-0.07	-0.82	-1.43	1.70	-0.22	0.00
50	ERTX	3.34	0.13	0.42	2.20	0.59	0.03	133.67
51	ESTI	7.82	0.25	0.76	5.98	0.83	0.06	187.06
52	INDR	2.58	0.04	0.14	1.92	0.48	0.02	887.89
53	MYTX	-4.64	-0.26	-1.36	-4.25	1.24	-0.09	53.84
54	PBRX	4.11	1.38	0.19	1.92	0.63	0.03	473.70
55	POLY	1.65	-0.02	-0.02	-0.69	2.37	-0.05	63.00
56	RICY	3.79	0.52	0.45	2.25	0.57	0.01	166.47
57	SRIL	1.19	0.09	0.19	0.96	-0.04	0.15	260.04
58	SSTM	1.58	-0.02	-0.15	-0.69	2.44	-0.02	73.34
59	STAR	1.80	0.01	0.10	1.41	0.29	0.01	54.51
60	TFCO	3.75	0.03	0.15	2.91	0.66	0.02	810.78
61	BATA	0.89	0.23	0.78	0.59	-0.71	0.53	841.23
62	BIMA	6.16	1.84	0.85	2.82	0.65	0.19	182.28
63	JECC	7.43	0.58	0.32	5.70	0.82	0.08	3,141.03
64	KBLI	3.31	0.70	0.46	1.73	0.42	0.18	281.06
65	KBLM	4.83	0.19	0.24	3.68	0.73	0.03	271.81
66	SCCO	6.41	1.21	0.25	4.18	0.76	0.14	6,067.36
67	VOKS	5.34	0.75	0.27	3.59	0.72	0.10	232.92
68	PTSN	2.30	0.21	0.33	1.45	0.31	0.02	21.39
69	INTP	8.14	0.29	0.34	6.63	0.88	0.13	17,839.01
70	SMBR	4.84	0.09	0.45	3.57	0.73	0.06	1,086.23
71	SMCB	1.46	0.01	0.14	0.52	0.78	-0.01	1,069.27
72	SMGR	6.59	0.18	0.83	4.56	1.02	0.10	9,743.22
73	WTON	8.32	0.16	2.26	5.10	0.79	0.06	944.80
74	AMFG	3.94	0.12	0.57	2.62	0.63	0.05	6,725.62
75	ARNA	4.43	0.20	0.38	3.16	0.68	0.06	16.51
76	IKAI	-15.42	-0.53	-11.62	-4.49	1.22	-0.55	38.66
77	KIAS	-2.73	-0.15	-0.47	-3.41	1.30	-0.14	79.40
78	MLIA	0.83	0.03	0.34	0.76	-0.31	0.01	531.94
79	TOTO	2.64	0.25	0.29	1.70	0.41	0.07	584.28
80	ALKA	1.63	0.52	0.16	0.97	-0.03	0.01	1.58
81	ALMI	1.50	-0.11	-0.15	-0.69	2.45	-0.05	184.41
82	BAJA	3.43	0.22	0.17	2.45	0.59	0.04	878.00

APPENDIX: A

83	BTON	4.17	-0.20	-0.02	-0.27	4.66	-0.03	125.20
84	CTBN	1.25	0.16	0.20	0.95	-0.06	-0.01	5,286.36
85	GDST	1.75	0.07	0.17	1.29	0.22	0.03	107.73
86	INAI	3.08	0.43	0.15	2.00	0.50	0.03	226.26
87	ISSP	4.47	0.17	0.46	3.00	0.83	0.02	229.22
88	JKSW	-7.13	-1.40	-0.70	-6.19	1.16	-0.01	60.93
89	KRAS	1.22	-0.02	-0.09	-0.60	1.92	-0.05	724.38
90	LION	3.07	0.95	0.30	1.50	0.33	0.06	950.49
91	LMSH	2.97	0.28	0.32	1.90	0.47	0.04	591.47
92	NIKL	2.39	0.22	0.10	1.67	0.40	0.02	900.02
93	PICO	0.03	0.11	0.06	0.58	-0.72	0.02	216.05
94	TBMS	6.26	0.77	0.11	4.60	0.78	0.06	728.95
95	BRPT	6.19	0.20	0.61	4.57	0.81	0.11	131.84
96	BUDI	2.52	0.06	0.18	1.82	0.45	0.01	91.73
97	DPNS	3.70	1.85	0.19	1.38	0.28	0.03	371.75
98	EKAD	4.61	0.39	0.67	2.90	0.65	0.13	584.51
99	ETWA	-7.68	-0.35	-0.82	-7.62	1.11	-0.08	365.46
100	INCI	3.05	0.17	0.20	2.14	0.53	0.04	257.13
101	SRSN	1.53	0.15	0.27	1.05	0.05	0.02	50.00
102	TPIA	10.47	0.32	0.91	8.36	0.88	0.14	3,458.28
103	UNIC	3.67	0.38	0.21	2.48	0.60	0.09	1,766.61
104	AKPI	2.37	0.07	0.15	1.72	0.42	0.02	871.26
105	APLI	3.92	0.18	0.84	2.32	0.57	0.08	87.84
106	BRNA	2.60	-0.03	-0.08	-0.24	2.95	0.01	905.44
107	FPNI	3.79	0.05	0.16	1.64	1.93	0.01	138.55
108	IGAR	5.94	1.42	0.42	3.40	0.71	0.16	571.70
109	IPOL	2.67	0.10	0.33	1.69	0.55	0.02	111.30
110	TALF	2.76	0.11	0.34	1.85	0.46	0.03	388.68
111	TRST	1.81	0.03	0.01	1.45	0.31	0.01	308.58
112	YPAS	0.71	0.04	0.12	0.80	-0.24	-0.04	832.35
113	CPIN	3.99	0.24	0.50	2.46	0.80	0.09	3,472.93
114	JPFA	3.44	0.41	0.78	1.78	0.47	0.11	1,273.32
115	MAIN	5.47	0.36	1.22	3.21	0.69	0.07	32.90
116	SIPD	1.64	0.18	0.16	1.06	0.23	0.02	828.09
117	SULI	1.19	0.11	0.57	0.79	-0.27	0.01	143.19
118	TIRT	2.13	0.20	0.95	0.99	-0.01	0.04	115.81
119	ALDO	2.97	0.56	0.32	1.68	0.40	0.06	441.86
120	FASW	6.42	0.13	0.58	4.91	0.80	0.09	2,595.74
121	INKP	-15.70	-0.61	-2.07	-14.10	1.07	0.03	998.16
122	INRU	-0.45	-0.03	-1.02	-1.22	1.82	0.11	352.92

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123	KDSI	2.44	0.32	0.28	1.50	0.33	0.04	291.90
124	SPMA	5.35	0.10	0.51	3.99	0.75	0.04	143.63
125	TKIM	-7.81	0.01	0.03	0.11	-7.96	0.01	711.49

No.	Emiten	2017						
		IC					ROA	MV
		Ev-VAIC	VAPY	VAFI	VAHU	STVA		
1	ADES	2.81	0.31	0.63	1.53	0.35	0.05	1,052.59
2	AISA	-1.55	-0.14	-0.16	-2.20	0.95	-2.64	945.51
3	ALTO	-2.09	-0.06	-0.99	-2.45	1.41	-0.06	425.26
4	CEKA	4.15	0.9	0.63	2.10	0.52	0.12	1,690.59
5	DLTA	9.40	4.84	0.43	3.42	0.71	0.21	4,653.51
6	ICBP	3.67	0.86	0.53	1.48	0.79	0.11	8,577.47
7	INDF	1.44	0.26	0.33	0.71	0.14	0.06	8,165.00
8	MLBI	15.78	1.41	2.42	11.04	0.91	0.53	12,656.75
9	MYOR	6.84	0.66	0.32	5.06	0.80	0.11	2,016.43
10	PSDN	3.34	0.46	0.83	1.65	0.40	0.05	189.11
11	ROTI	2.41	0.27	0.24	1.47	0.44	0.03	1,317.43
12	SKBM	4.84	0.17	0.16	1.27	3.24	0.02	612.85
13	SKLT	2.37	0.38	0.73	1.13	0.12	0.04	712.28
14	STTP	3.63	0.29	0.52	2.27	0.56	0.09	3,819.85
15	ULTJ	6.91	0.86	0.43	4.82	0.80	0.14	1,246.50
16	GGRM	7.28	0.47	1.87	4.17	0.76	0.12	71,195.61
17	HMSP	7.25	2.37	1.57	2.35	0.96	0.29	3,936.60
18	RMBA	2.32	0.23	0.53	1.31	0.25	-0.03	411.51
19	WIIM	3.77	0.74	1.78	1.12	0.12	0.03	375.75
20	DVLA	3.39	0.95	0.4	1.62	0.42	0.10	1,945.00
21	INAF	-1.31	0.12	0.16	0.28	-1.86	-0.03	3,399.14
22	KAEF	-3.88	0.56	0.55	1.03	-6.02	0.05	2,436.70
23	KLBF	1.13	0.98	0.87	0.44	-1.17	0.15	1,613.71
24	MERK	6.03	1.93	1.24	2.29	0.57	0.03	9,022.95
25	PYFA	3.65	0.8	1.62	1.12	0.11	0.04	201.65
26	SCPI	4.08	0.91	0.62	2.03	0.51	0.09	9,022.95
27	SIDO	5.60	0.69	0.62	3.92	0.36	0.17	255.8
28	TSPC	3.54	0.79	0.49	1.81	0.45	0.07	1,860.00
29	KINO	2.46	0.36	0.33	1.45	0.31	0.03	2,414.28
30	MBTO	1.67	0.55	0.21	0.70	0.21	-0.03	143.76
31	MRAT	2.09	0.79	0.27	1.01	0.01	-0.03	209.38
32	TCID	3.02	0.51	0.59	1.49	0.43	0.08	17,634.77
33	UNVR	7.69	0.75	1.49	4.61	0.84	0.37	9,553.03
34	CINT	3.26	0.32	0.68	1.80	0.46	0.06	314.51
35	KICI	2.74	0.52	0.95	1.15	0.13	0.05	160.5

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36	LMPI	7.31	-0.02	-0.02	-0.15	7.50	-0.04	157.81
37	ASII	5.22	0.80	0.44	3.21	0.77	0.08	8,259.52
38	AUTO	2.91	0.31	0.45	1.61	0.54	0.04	2,623.00
39	BRAM	4.99	0.19	0.78	3.24	0.78	0.08	7,287.97
40	GDYR	-0.46	0.04	0.23	0.44	-1.17	-0.01	2,011.50
41	GJTL	1.39	0.10	0.18	1.06	0.05	0.02	926.15
42	IMAS	3.25	0.25	0.15	2.29	0.56	0.00	1,056.38
43	INDS	3.48	0.17	0.35	2.38	0.58	0.05	1,029.78
44	LPIN	4.33	2.58	0.25	1.28	0.22	0.72	280.00
45	MASA	-5.76	0.03	0.02	0.14	-5.92	-0.01	278.88
46	PRAS	1.24	0.01	0.05	1.10	0.09	-0.02	197.57
47	SMSM	5.39	1.24	1.10	2.45	0.60	0.23	1,140.67
48	ADMG	-1.33	0.03	0.09	0.36	-1.80	-0.04	209.88
49	ARGO	-4.47	-1.21	-2.28	-2.39	1.42	-0.15	831.64
50	ERTX	3.42	-0.03	-0.08	-0.33	3.86	-0.03	142.40
51	ESTI	-0.13	-0.04	-0.27	-1.49	1.67	-0.03	127.25
52	INDR	4.62	0.07	0.22	3.61	0.72	0.02	1,280.55
53	MYTX	-2.30	-0.08	-0.57	-3.00	1.33	-0.08	136.89
54	PBRX	2.70	0.24	0.15	1.72	0.59	0.01	495.16
55	POLY	1.30	0.18	0.13	0.99	0.00	-0.02	71.14
56	RICY	2.26	0.36	0.29	1.34	0.28	0.01	156.45
57	SRIL	1.68	0.10	0.16	1.24	0.19	0.06	345.60
58	SSTM	-0.60	-0.06	-0.97	-1.32	1.76	-0.04	470.63
59	STAR	1.13	0.01	0.01	1.05	0.05	0.01	79.94
60	TFCO	2.60	0.03	0.11	1.97	0.49	0.01	812.08
61	BATA	4.44	0.61	2.08	1.45	0.31	0.06	630.29
62	BIMA	3.31	1.66	0.54	1.06	0.05	0.18	92.81
63	JECC	4.74	0.25	0.27	3.51	0.71	0.04	5,349.13
64	KBLI	2.26	0.41	0.49	1.20	0.16	0.12	539.78
65	KBLM	4.81	0.09	0.18	3.80	0.74	0.04	388.24
66	SCCO	3.98	0.19	0.20	2.93	0.66	0.07	9,391.46
67	VOKS	5.05	0.82	0.26	3.27	0.69	0.08	313.42
68	PTSN	1.73	0.17	0.52	1.02	0.02	0.01	54.86
69	INTP	5.03	0.16	0.23	3.86	0.78	0.06	18,645.12
70	SMBR	2.94	0.07	0.29	2.01	0.57	0.03	3,087.16
71	SMCB	1.14	-0.02	-0.14	-0.44	1.73	-0.04	829.17
72	SMGR	3.31	0.10	0.39	1.95	0.86	0.03	9,730.64
73	WTON	5.56	0.17	0.16	4.46	0.78	0.05	620.24
74	AMFG	1.07	0.05	0.25	0.88	-0.11	0.01	6,545.95
75	ARNA	4.94	0.27	0.38	3.57	0.72	0.08	23.18
76	IKAI	-12.51	-0.26	-7.77	-5.66	1.18	0.25	35.84

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77	KIAS	3.27	-0.02	-0.07	-0.37	3.72	-0.05	91.11
78	MLIA	1.53	0.10	0.55	0.94	-0.07	0.01	590.16
79	TOTO	3.15	0.37	0.39	1.91	0.48	0.10	446.87
80	ALKA	3.94	1.37	0.13	1.95	0.49	0.05	1.25
81	ALMI	1.09	0.08	0.09	0.96	-0.04	0.01	220.49
82	BAJA	2.58	-0.06	-0.06	-0.46	3.16	-0.02	1,486.68
83	BTON	5.05	1.54	0.13	2.93	0.45	0.06	126.12
84	CTBN	3.12	-0.07	-0.07	-0.38	3.64	-0.08	4,850.00
85	GDST	1.36	0.03	0.38	0.97	-0.03	-0.01	104.47
86	INAI	2.69	0.38	0.13	1.75	0.43	0.03	340.90
87	ISSP	1.67	0.06	0.16	1.06	0.38	0.01	229.88
88	JKSW	0.22	-0.06	-0.06	-1.38	1.73	-0.02	91.99
89	KRAS	0.37	0.02	0.10	0.54	-0.29	-0.02	568.2
90	LION	1.74	0.50	0.23	1.00	0.00	0.01	820.91
91	LMSH	3.61	0.30	0.38	2.35	0.57	0.08	638.50
92	NIKL	0.19	0.19	0.08	0.60	-0.67	0.01	3,826.72
93	PICO	0.23	0.13	0.05	0.63	-0.58	0.02	191.35
94	TBMS	4.88	0.69	0.07	3.41	0.71	0.05	1,140.81
95	BRPT	20.77	0.05	0.07	0.94	19.70	0.08	312.96
96	BUDI	2.62	0.07	0.21	1.87	0.47	0.02	97.57
97	DPNS	2.75	1.47	0.20	1.04	0.04	0.19	379.41
98	EKAD	3.86	0.36	0.57	2.36	0.58	0.10	690.73
99	ETWA	-9.90	-0.51	-1.05	-9.43	1.08	-0.13	89.06
100	INCI	3.01	0.23	0.23	2.04	0.51	0.05	332.92
101	SRSN	2.35	0.26	0.53	1.32	0.24	0.03	50.05
102	TPIA	12.82	0.25	0.33	11.33	0.91	0.11	4,995.75
103	UNIC	3.55	0.38	0.36	2.26	0.56	0.05	4,240.18
104	AKPI	1.55	0.04	0.12	1.21	0.18	0.01	832.84
105	APLI	1.43	0.13	0.43	0.94	-0.06	-0.03	112.04
106	BRNA	2.08	-0.08	-0.23	-0.46	2.85	-0.09	1,151.88
107	FPNI	6.05	0.01	0.04	0.27	5.74	-0.01	326.86
108	IGAR	7.84	1.37	0.42	5.24	0.82	0.14	451.38
109	IPOL	1.76	0.09	0.27	1.12	0.28	0.01	163.85
110	TALF	1.83	0.09	0.28	1.26	0.21	0.02	364.87
111	TRST	2.23	0.04	0.15	1.65	0.39	0.01	351.68
112	YPAS	1.12	-0.05	-0.08	-0.88	2.13	0.01	1,037.84
113	CPIN	2.78	0.19	0.48	1.52	0.58	-0.05	3,014.90
114	JPFA	1.75	0.26	0.62	0.92	-0.04	0.10	1,412.54
115	MAIN	1.57	0.10	0.32	1.08	0.07	0.01	38.55
116	SIPD	1.04	-0.11	-0.17	-0.76	2.07	-0.16	899.20

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117	SULI	2.34	0.17	1.14	1.02	0.02	0.02	239.37
118	TIRT	-0.21	0.10	0.24	0.49	-1.04	0.01	144.74
119	ALDO	2.96	0.45	0.33	1.75	0.43	0.06	363.85
120	FASW	4.73	0.10	0.41	3.37	0.85	0.06	4,865.19
121	INKP	3.66	0.13	0.23	2.68	0.63	0.05	3,320.51
122	INRU	-5.23	-0.08	-3.79	-2.72	1.37	0.08	372.99
123	KDSI	2.82	0.34	0.30	1.75	0.43	0.05	513.08
124	SPMA	5.58	0.12	0.61	4.09	0.76	0.04	168.37
125	TKIM	-2.09	0.03	0.06	0.29	-2.47	0.01	2,448.37

No.	Emiten	2018						
		IC					ROA	MV
		Ev-VAIC	VAPY	VAFI	VAHU	STVA		
1	ADES	3.12	0.36	0.53	1.78	0.45	0.06	921.05
2	AISA	3.06	0.13	0.22	0.76	1.94	-0.07	536.25
3	ALTO	-0.22	-0.03	-0.40	-1.47	1.68	-0.03	380.01
4	CEKA	3.85	0.92	0.63	1.84	0.46	0.12	1,124.35
5	DLTA	11.17	5.73	0.46	4.21	0.76	0.22	5,302.89
6	ICBP	-3.52	-1.13	-0.93	-2.53	1.07	0.14	8,891.85
7	INDF	1.69	0.18	0.33	0.71	0.46	0.05	6,829.88
8	MLBI	21.86	1.15	1.92	17.84	0.94	0.42	16,002.35
9	MYOR	7.45	0.68	0.34	5.61	0.82	0.10	2,733.49
10	PSDN	1.33	0.24	0.41	0.85	-0.17	-0.07	453.98
11	ROTI	2.47	0.27	0.34	1.45	0.41	0.03	1,091.71
12	SKBM	5.05	0.13	0.29	1.21	3.41	0.01	548.2
13	SKLT	2.56	0.41	0.58	1.33	0.25	0.04	1,260.31
14	STTP	3.50	0.33	0.43	2.19	0.54	0.10	4,204.41
15	ULTJ	6.35	0.72	0.38	4.46	0.79	0.13	1,345.08
16	GGRM	7.85	0.46	2.65	3.99	0.75	0.11	75,050.63
17	HMSP	6.50	2.38	0.97	2.54	0.61	0.29	3,907.79
18	RMBA	0.31	0.10	0.20	0.61	-0.60	-0.04	2,405.98
19	WIIM	3.57	0.76	1.44	1.20	0.17	0.04	204.05
20	DVLA	3.97	1.07	0.48	1.91	0.51	0.12	1,961.84
21	INAF	-0.43	0.18	0.26	0.43	-1.30	-0.02	4,790.43
22	KAEF	2.06	0.38	0.46	1.10	0.12	0.04	2,405.98
23	KLBF	3.31	0.56	0.51	1.70	0.54	0.14	1,454.20
24	MERK	2.60	0.58	0.16	1.51	0.35	0.03	4,499.91
25	PYFA	3.34	0.68	1.37	1.16	0.14	0.05	192.66
26	SCPI	4.73	1.23	0.98	2.01	0.50	0.08	4,499.91
27	SIDO	6.12	0.59	0.75	3.93	0.85	0.20	378.85
28	TSPC	3.37	0.69	0.49	1.77	0.43	0.07	1,477.87
29	KINO	2.72	0.38	0.38	1.59	0.37	0.04	2,215.53

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30	MBTO	0.32	-0.46	-0.24	-0.67	1.70	-0.18	146.44
31	MRAT	2.24	0.78	0.29	1.09	0.08	0.004	187.82
32	TCID	3.16	0.51	0.65	1.55	0.45	0.07	17,648.93
33	UNVR	10.27	0.97	1.88	6.53	0.90	0.47	9,327.96
34	CINT	2.92	0.26	0.81	1.51	0.35	0.03	308.95
35	KICI	1.94	0.34	0.65	0.97	-0.03	-0.01	208.54
36	LMPI	0.76	-0.11	-0.16	-0.98	2.02	-0.06	172.7
37	ASII	3.92	0.54	0.34	2.33	0.71	0.08	7,622.47
38	AUTO	3.41	0.36	0.46	1.95	0.63	0.04	1,596.66
39	BRAM	5.36	0.21	0.81	3.56	0.78	0.07	6,592.23
40	GDYR	1.10	0.05	0.36	0.84	-0.14	0.04	2,027.74
41	GJTL	2.13	0.11	0.23	1.46	0.32	-0.04	788.70
42	IMAS	3.10	0.21	0.13	2.22	0.55	0.02	2,530.74
43	INDS	3.23	0.16	0.30	2.21	0.55	0.04	2,163.12
44	LPIN	7.48	4.47	0.54	1.98	0.49	0.11	231.10
45	MASA	4.35	-0.01	-0.04	-0.27	4.66	-0.04	592.29
46	PRAS	1.87	0.03	0.12	1.42	0.30	0.04	197.80
47	SMSM	5.86	1.30	1.11	2.80	0.65	0.23	1,401.77
48	ADMG	1.59	0.12	0.32	1.08	0.07	-0.02	334.13
49	ARGO	-1.17	-0.07	-1.18	-1.55	1.64	-0.09	825.00
50	ERTX	1.41	0.07	0.16	1.05	0.12	0.02	139.43
51	ESTI	4.04	0.10	0.72	2.60	0.61	0.02	91.73
52	INDR	6.06	0.09	0.29	4.89	0.80	0.08	5,849.77
53	MYTX	-0.57	-0.03	-0.45	-1.68	1.59	-0.05	145.56
54	PBRX	3.30	0.30	0.18	2.14	0.68	0.03	502.88
55	POLY	3.59	0.40	0.30	2.32	0.57	0.05	169.52
56	RICY	2.57	0.45	0.31	1.47	0.34	0.01	164.18
57	SRIL	0.16	0.07	0.14	0.60	-0.66	0.06	354.26
58	SSTM	2.04	0.05	0.70	1.15	0.13	0.02	491.51
59	STAR	1.12	0.01	0.01	1.05	0.05	0.03	85.03
60	TFCO	0.73	0.01	0.06	0.85	-0.18	-0.02	681.98
61	BATA	5.06	0.61	2.36	1.68	0.41	0.08	600.69
62	BIMA	4.24	1.63	0.99	1.36	0.26	0.02	77.26
63	JECC	5.57	0.35	0.29	4.17	0.76	0.04	6,145.27
64	KBLI	1.66	0.35	0.28	1.01	0.01	0.07	440.92
65	KBLM	6.04	0.12	0.24	4.88	0.80	0.03	291.66
66	SCCO	3.67	0.18	0.24	2.63	0.62	0.06	9,738.82
67	VOKS	4.06	0.49	0.18	2.75	0.64	0.04	232.36
68	PTSN	3.73	0.28	0.18	2.65	0.62	0.04	407.74
69	INTP	3.84	0.12	0.17	2.84	0.71	0.04	17,658.50
70	SMBR	2.63	0.05	0.21	1.62	0.76	0.01	3,022.77

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71	SMCB	-0.18	-0.03	-0.27	-1.03	1.14	-0.04	1,693.62
72	SMGR	4.84	0.13	0.38	3.35	0.98	0.06	9,923.62
73	WTON	6.56	0.21	0.15	5.39	0.81	0.05	465.83
74	AMFG	1.35	0.03	0.22	1.04	0.06	0.01	4,529.72
75	ARNA	5.78	0.35	0.40	4.26	0.77	0.10	40.25
76	IKAI	-2.91	-0.59	-0.58	-3.07	1.33	0.05	188.33
77	KIAS	0.74	-0.04	-0.11	-1.05	1.94	-0.05	0.00
78	MLIA	2.58	0.13	0.97	1.27	0.21	0.04	973.10
79	TOTO	5.05	0.54	0.48	3.33	0.70	0.12	333.51
80	ALKA	4.96	1.98	0.07	2.34	0.57	0.04	2.96
81	ALMI	3.18	1.23	0.21	1.44	0.31	0.02	400.23
82	BAJA	-0.81	-0.23	-0.18	-1.92	1.52	-0.11	2,298.10
83	BTON	8.02	3.51	0.21	3.58	0.72	0.13	247.27
84	CTBN	1.28	0.16	0.21	0.95	-0.05	-0.04	4,520.24
85	GDST	-2.13	-0.11	-0.80	-2.84	1.63	-0.06	130.83
86	INAI	2.70	0.44	0.12	1.72	0.42	0.03	460.57
87	ISSP	2.10	0.08	0.19	1.38	0.45	0.01	97.67
88	JKSW	0.22	0.06	0.03	0.66	-0.53	-0.03	79.05
89	KRAS	0.00	0.01	0.01	0.05	-12.35	-0.02	457.42
90	LION	2.27	0.67	0.28	1.17	0.15	0.02	631.25
91	LMSH	1.99	0.18	0.23	1.33	0.25	0.02	695.28
92	NIKL	1.56	0.11	0.05	1.22	0.18	-0.01	4,167.65
93	PICO	0.33	0.92	0.04	0.48	-1.10	0.02	269.55
94	TBMS	7.38	1.17	0.09	5.31	0.81	0.03	1,019.50
95	BRPT	9.50	0.14	0.16	3.42	5.78	0.03	449.63
96	BUDI	2.79	0.08	0.18	2.02	0.51	0.01	118.93
97	DPNS	4.08	2.30	0.21	1.32	0.24	0.03	359.20
98	EKAD	3.71	0.36	0.55	2.24	0.56	0.09	722.11
99	ETWA	-5.82	-0.33	-0.76	-5.86	1.13	-0.13	91.00
100	INCI	2.52	0.22	0.25	1.65	0.40	0.04	562.14
101	SRSN	3.39	0.35	0.57	1.98	0.49	0.06	66.05
102	TPIA	5.11	0.14	0.25	3.97	0.75	0.06	5,827.68
103	UNIC	5.20	0.57	0.45	3.46	0.71	0.07	3,623.16
104	AKPI	2.89	0.07	0.17	2.11	0.53	0.02	748.62
105	APLI	-0.90	0.06	0.11	0.41	-1.47	-0.05	102.4
106	BRNA	-0.73	0.04	0.12	0.29	-1.18	-0.01	1,211.74
107	FPNI	5.27	0.12	0.39	3.29	1.47	0.03	171.77
108	IGAR	4.47	0.56	0.27	2.96	0.67	0.08	394.75
109	IPOL	2.36	0.11	0.29	1.50	0.46	0.02	112.59
110	TALF	3.66	0.14	0.42	2.60	0.50	0.04	352.15

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111	TRST	2.75	0.03	0.13	2.06	0.52	0.01	398.34
112	YPAS	3.74	-0.02	-0.02	-0.32	4.10	-0.03	657.53
113	CPIN	5.73	0.46	0.92	3.55	0.81	0.16	4,646.98
114	JPFA	3.50	0.46	1.11	1.55	0.39	0.10	1,926.97
115	MAIN	4.16	0.24	1.02	2.33	0.57	0.07	37.38
116	SIPD	2.05	0.21	0.31	1.22	0.31	0.01	1,032.00
117	SULI	1.21	0.12	0.54	0.80	-0.25	0.03	153.37
118	TIRT	0.63	-0.08	-0.20	-1.05	1.95	-0.04	94.26
119	ALDO	3.68	0.59	0.41	2.14	0.53	0.08	410.49
120	FASW	8.71	0.23	0.73	6.89	0.86	0.13	7,264.36
121	INKP	5.77	0.20	0.27	4.52	0.78	0.07	14,675.70
122	INRU	5.09	0.05	2.61	1.94	0.48	0.01	843.65
123	KDSI	2.94	0.33	0.41	1.81	0.39	0.06	893.11
124	SPMA	5.20	0.15	0.49	3.82	0.74	0.04	234.31
125	TKIM	3.84	0.23	0.36	2.63	0.62	0.08	11,410.54

No.	Emiten	2019						
		IC					ROA	MV
		Ev-VAIC	VAPY	VAFI	VAHU	STVA		
1	ADES	3.92	0.49	0.61	2.25	0.58	0.10	1,066.08
2	AISA	13.49	1.77	7.42	3.47	0.82	0.61	0.00
3	ALTO	-1.60	0.01	0.11	0.33	-2.04	-0.01	390.90
4	CEKA	6.74	1.69	0.46	3.85	0.74	0.20	1,450.19
5	DLTA	10.67	5.58	0.47	3.88	0.74	0.22	6,594.29
6	ICBP	3.42	0.63	0.56	1.40	0.82	0.14	10,756.85
7	INDF	2.28	0.26	0.47	0.99	0.56	0.06	10,756.85
8	MLBI	14.23	1.19	1.98	10.16	0.90	0.42	17,776.33
9	MYOR	4.50	0.98	0.49	2.44	0.59	0.11	2,399.49
10	PSDN	1.95	0.19	0.73	1.01	0.02	-0.03	198.53
11	ROTI	3.15	0.34	0.50	1.79	0.52	0.07	1,265.91
12	SKBM	4.70	0.12	0.16	1.03	3.40	0.01	493.99
13	SKLT	2.97	0.46	0.75	1.45	0.31	0.06	1,583.04
14	STTP	5.37	0.54	0.76	3.36	0.70	0.17	3,621.98
15	ULTJ	7.89	0.94	0.43	5.70	0.83	0.16	1,464.11
16	GGRM	8.69	0.53	2.43	4.93	0.80	0.14	67,807.05
17	HMSP	6.47	2.38	0.83	2.64	0.62	0.27	2,733.44
18	RMBA	1.50	0.17	0.29	1.02	0.02	0.03	369.30
19	WIIM	2.59	0.65	0.62	1.17	0.15	0.02	267.98
20	DVLA	3.92	0.97	0.50	1.95	0.50	0.12	2,241.43
21	INAF	0.78	0.25	0.29	0.65	-0.41	0.01	1,387.31
22	KAEF	1.05	0.14	0.39	0.74	-0.22	0.01	2,407.83

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23	KLBF	4.65	0.71	0.77	2.45	0.71	0.13	1,567.02
24	MERK	3.58	0.86	0.37	1.88	0.48	0.09	3,974.47
25	PYFA	3.37	0.74	1.39	1.13	0.12	0.05	180.74
26	SCPI	4.01	0.91	0.92	1.75	0.43	0.08	3,974.47
27	SIDO	6.74	0.61	0.69	4.56	0.87	0.23	557.83
28	TSPC	3.45	0.71	0.47	1.82	0.45	0.10	1,598.17
29	KINO	4.21	0.50	0.63	2.48	0.60	0.11	3,456.82
30	MBTO	0.43	0.44	0.30	0.40	-0.71	-0.11	121.26
31	MRAT	1.90	0.70	0.23	0.98	-0.02	0.01	167.22
32	TCID	2.96	0.50	0.63	1.40	0.44	0.06	12,774.84
33	UNVR	6.08	0.79	1.40	3.15	0.74	0.36	9,136.35
34	CINT	2.46	0.25	0.67	1.30	0.25	0.01	269.17
35	KICI	0.66	0.28	0.55	0.57	-0.75	0.02	327.99
36	LMPI	0.85	-0.10	-0.26	-0.90	2.11	-1.11	126.09
37	ASII	3.77	0.52	0.33	2.24	0.68	0.08	7,209.59
38	AUTO	3.38	0.41	0.56	1.83	0.58	0.05	1,387.34
39	BRAM	3.96	0.14	0.52	2.59	0.71	0.05	9,866.59
40	GDYR	0.20	0.05	0.17	0.60	-0.62	-0.01	2,037.25
41	GJTL	4.86	0.24	0.45	3.46	0.71	0.01	715.94
42	IMAS	3.27	0.20	0.14	2.36	0.58	0.03	2,444.03
43	INDS	3.28	0.12	0.48	2.14	0.53	0.04	2,401.53
44	LPIN	6.59	4.02	0.39	1.75	0.43	0.09	271.08
45	MASA	1.49	0.05	0.11	1.18	0.15	-0.02	784.97
46	PRAS	2.42	-0.01	-0.09	-0.49	3.02	-0.03	172.06
47	SMSM	5.29	1.32	0.85	2.51	0.61	0.21	1,514.35
48	ADMG	0.02	-0.57	-0.43	-0.99	2.01	-0.12	266.62
49	ARGO	-0.70	-0.05	-0.69	-1.59	1.63	-0.09	0.00
50	ERTX	1.48	0.10	0.25	1.04	0.09	0.01	132.19
51	ESTI	-0.51	-0.06	-0.42	-1.64	1.61	-0.05	95.01
52	INDR	2.67	0.05	0.23	1.77	0.62	0.05	5,211.40
53	MYTX	-1.20	-0.05	-0.69	-1.96	1.51	-0.07	78.91
54	PBRX	3.56	0.35	0.19	2.34	0.69	0.03	629.73
55	POLY	0.55	0.12	0.11	0.71	-0.39	-0.05	106.76
56	RICY	-7.80	-1.91	-1.18	-5.87	1.17	0.01	185.38
57	SRIL	1.41	0.14	0.19	1.04	0.04	0.06	341.86
58	SSTM	1.19	-0.04	-0.50	-0.70	2.42	-0.03	422.37
59	STAR	10.20	8.35	0.01	1.51	0.34	0.03	111.61
60	TFCO	-0.08	-0.02	-0.06	-1.62	1.62	0.02	603.56
61	BATA	3.29	0.38	1.75	1.08	0.08	0.03	615.69
62	BIMA	0.94	0.07	0.62	0.69	-0.44	0.01	52.38
63	JECC	5.24	0.40	0.38	3.73	0.73	0.05	6,417.61
64	KBLI	2.51	0.59	0.32	1.34	0.25	0.11	497.18

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65	KBLM	4.53	0.10	0.31	3.42	0.71	0.03	271.42
66	SCCO	4.03	0.21	0.26	2.90	0.66	0.07	9,201.27
67	VOKS	4.66	0.53	0.18	3.26	0.69	0.07	318.45
68	PTSN	1.80	0.13	0.34	1.18	0.15	0.01	458.47
69	INTP	4.87	0.18	0.23	3.69	0.77	0.07	20,391.63
70	SMBR	3.36	0.07	0.41	1.81	1.07	0.01	763.9
71	SMCB	3.64	0.05	0.42	2.21	0.95	0.03	1,987.87
72	SMGR	4.24	0.07	0.38	2.21	1.58	0.03	12,368.94
73	WTON	6.39	0.21	0.12	5.25	0.81	0.05	531.16
74	AMFG	-4.00	0.01	0.05	0.19	-4.25	0.02	4,604.15
75	ARNA	5.57	0.45	0.41	3.97	0.75	0.12	50.49
76	IKAI	-0.77	-0.15	-0.56	-1.66	1.60	-0.05	167.54
77	KIAS	-0.74	-0.24	-0.64	-1.51	1.66	-0.40	89.44
78	MLIA	2.15	0.08	0.41	1.39	0.28	0.02	1,182.32
79	TOTO	1.32	0.24	0.16	0.96	-0.04	0.05	359.03
80	ALKA	2.93	1.57	0.05	1.17	0.15	0.01	2.20
81	ALMI	-5.61	-0.38	-1.69	-4.74	1.21	-0.18	625.92
82	BAJA	-1.07	0.06	0.05	0.39	-1.57	0.01	3,440.16
83	BTON	0.52	0.75	0.04	0.55	-0.82	0.01	264.91
84	CTBN	1.64	0.19	0.21	1.13	0.11	0.01	4,175.54
85	GDST	2.04	0.07	0.40	1.64	-0.06	0.02	91.62
86	INAI	2.50	0.42	0.18	1.54	0.35	0.03	456.88
87	ISSP	3.58	0.15	0.30	2.46	0.67	0.03	148.39
88	JKSW	0.31	0.05	0.05	0.68	-0.47	-0.01	59.61
89	KRAS	-2.01	-0.16	-0.87	-2.40	1.41	-0.15	417.51
90	LION	2.01	0.80	0.26	0.98	-0.02	0.01	525.55
91	LMSH	0.68	-0.15	-0.20	-0.99	2.01	-0.12	526.41
92	NIKL	0.50	0.18	0.06	0.69	-0.44	0.02	887.01
93	PICO	-2.22	0.07	0.02	0.28	-2.58	0.01	2,517.32
94	TBMS	5.28	0.86	0.09	3.60	0.72	0.04	842.93
95	BRPT	10.51	0.08	0.11	1.67	8.65	0.02	836.61
96	BUDI	2.90	0.09	0.25	2.05	0.51	0.02	102.66
97	DPNS	2.96	1.77	0.18	1.02	0.00	0.01	298.98
98	EKAD	3.49	0.31	0.47	2.17	0.55	0.08	884.75
99	ETWA	-4.46	-0.19	-0.50	-4.93	1.16	-0.08	71.89
100	INCI	2.51	0.21	0.21	1.68	0.41	0.03	486.31
101	SRSN	3.33	0.40	0.50	1.94	0.49	0.05	70.37
102	TPIA	1.53	0.04	0.09	1.22	0.18	0.01	7,718.30
103	UNIC	3.85	0.47	0.40	2.40	0.58	0.05	4,461.95
104	AKPI	2.52	0.08	0.16	1.82	0.45	0.02	426.68

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105	APLI	2.57	0.08	0.31	1.74	0.43	0.02	116.88
106	BRNA	-0.49	-0.14	-0.69	-1.19	1.53	-0.07	1,124.05
107	FPNI	-4.16	-0.01	-0.05	-0.26	-3.83	-0.02	150.88
108	IGAR	5.93	0.54	0.23	4.35	0.80	0.10	360.44
109	IPOL	2.01	0.11	0.29	1.27	0.34	0.02	97.69
110	TALF	1.85	0.09	0.31	1.24	0.20	0.02	324.22
111	TRST	1.80	0.02	0.08	1.40	0.29	0.01	394.09
112	YPAS	1.75	0.09	0.11	1.31	0.24	0.01	510.14
113	CPIN	4.76	0.31	1.02	2.69	0.74	0.13	5,852.78
114	JPFA	1.16	0.24	0.73	0.65	-0.46	0.07	1,730.04
115	MAIN	3.59	0.22	0.90	1.98	0.49	0.03	41.07
116	SIPD	2.77	0.32	0.33	1.67	0.46	0.03	991.11
117	SULI	0.10	-0.10	-1.05	-0.89	2.13	-0.09	65.6
118	TIRT	0.89	-0.14	-0.39	-0.81	2.23	-0.06	71.88
119	ALDO	3.74	0.42	0.65	2.14	0.53	0.08	388.39
120	FASW	4.64	0.12	0.68	3.15	0.68	0.09	7,975.89
121	INKP	3.46	0.13	0.15	2.57	0.61	0.03	8,046.49
122	INRU	-9.69	-0.07	-7.20	-3.69	1.27	-0.04	768.41
123	KDSI	2.56	0.30	0.44	1.49	0.33	0.05	1,128.77
124	SPMA	5.00	0.15	0.54	3.59	0.72	0.06	238.86
125	TKIM	2.90	0.19	0.27	1.95	0.49	0.05	11,339.18

No.	Emiten	2020						
		IC					ROA	MV
		Ev-VAIC	VAPY	VAFI	VAHU	STVA		
1	ADES	5.21	0.68	0.46	3.36	0.72	0.14	1,152.48
2	AISA	11.95	1.14	2.51	7.26	1.05	0.60	270.06
3	ALTO	-2.56	0.04	0.05	0.26	-2.87	-0.01	395.25
4	CEKA	5.72	1.40	0.33	3.29	0.70	0.15	1,768.01
5	DLTA	4.44	2.51	0.17	1.45	0.31	0.10	4,433.96
6	ICBP	9.47	0.66	0.56	1.59	6.67	0.07	9,579.19
7	INDF	6.24	0.39	0.63	1.58	3.64	0.05	6,764.99
8	MLBI	5.24	0.40	0.60	3.52	0.72	0.10	10,077.63
9	MYOR	6.03	0.44	0.28	4.53	0.78	0.11	2,269.22
10	PSDN	0.67	0.12	0.57	0.62	-0.63	-0.07	122.72
11	ROTI	2.47	0.32	0.53	1.36	0.27	0.04	1,235.65
12	SKBM	4.41	0.25	0.20	1.45	2.50	0.01	310.21
13	SKLT	2.81	0.48	0.73	1.35	0.26	0.05	1,526.39
14	STTP	5.10	0.48	0.64	3.29	0.70	0.18	7,382.07
15	ULTJ	7.18	0.88	0.28	5.21	0.81	0.13	1,622.53
16	GGRM	6.21	0.38	1.40	3.70	0.73	0.10	44,763.19

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17	HMSP	4.84	1.92	0.69	1.79	0.45	0.17	1,591.22
18	RMBA	5.29	-0.04	-0.05	-0.22	5.60	-0.21	433.71
19	WIIM	4.63	1.24	1.12	1.82	0.45	0.11	404.88
20	DVLA	3.30	0.84	0.57	1.49	0.40	0.08	2,354.25
21	INAF	1.63	0.41	0.27	0.94	0.02	0.01	2,064.51
22	KAEF	1.11	0.15	0.54	0.71	-0.29	0.01	2,614.15
23	KLBF	4.66	0.73	0.65	2.56	0.72	0.12	1,458.44
24	MERK	3.52	0.75	0.48	1.83	0.46	0.08	3,153.59
25	PYFA	3.69	0.89	1.09	1.41	0.30	0.10	871.84
26	SCPI	5.02	1.26	0.69	2.48	0.60	0.14	3,153.59
27	SIDO	6.93	0.71	0.66	4.70	0.87	0.24	702.70
28	TSPC	4.25	0.74	0.44	2.47	0.60	0.12	1,276.82
29	KINO	2.10	0.27	0.36	1.26	0.21	0.02	2,854.76
30	MBTO	0.18	-0.11	-0.99	-0.66	1.94	-0.21	76.17
31	MRAT	2.45	0.88	0.29	1.15	0.13	-0.01	142.91
32	TCID	1.17	0.25	0.25	0.76	-0.08	-0.02	6,884.55
33	UNVR	8.48	0.81	1.35	5.45	0.87	0.35	7,760.65
34	CINT	1.96	0.19	0.60	1.08	0.09	0.01	262.01
35	KICI	1.64	0.45	0.63	0.80	-0.24	0.01	227.29
36	LMPI	1.65	-0.08	-0.26	-0.65	2.64	-0.06	83.65
37	ASII	3.33	0.46	0.25	1.96	0.67	0.56	4,955.50
38	AUTO	1.85	0.21	0.26	1.08	0.29	-0.03	949.98
39	BRAM	1.73	0.06	0.20	1.14	0.34	-0.02	5,070.83
40	GDYR	6.54	-0.01	-0.02	-0.17	6.74	-0.06	1,464.13
41	GJTL	2.82	0.14	0.23	1.96	0.49	0.02	502.84
42	IMAS	2.53	0.16	0.11	1.81	0.45	-0.01	1,054.73
43	INDS	2.29	0.09	0.25	1.58	0.37	0.02	1,894.83
44	LPIN	2.48	1.80	0.14	0.79	-0.26	0.02	232.65
45	MASA	5.36	0.13	0.49	4.00	0.75	0.07	850.15
46	PRAS	1.02	0.02	0.13	0.93	-0.07	-0.03	125.35
47	SMSM	4.01	1.03	0.51	1.96	0.51	0.16	1,264.61
48	ADMG	0.85	-0.15	-0.49	-0.78	2.28	-0.19	161.13
49	ARGO	-0.98	-0.05	-0.82	-1.70	1.59	-0.06	1,888.03
50	ERTX	1.18	0.07	0.17	0.93	0.01	-0.01	128.28
51	ESTI	-7.21	0.00	0.05	0.12	-7.38	-0.01	52.43
52	INDR	2.32	0.03	0.12	1.74	0.43	0.01	2,218.99
53	MYTX	-0.49	-0.03	-0.66	-1.47	1.68	-0.03	52.64
54	PBRX	5.17	0.54	0.28	3.56	0.78	0.03	246.14
55	POLY	1.61	-0.10	-0.09	-0.67	2.48	-0.09	55.94
56	RICY	-5.88	0.05	0.03	0.14	-6.09	-0.04	92.99
57	SRIL	0.14	0.09	0.10	0.60	-0.65	0.05	175.42
58	SSTM	0.37	-0.04	-0.60	-0.99	2.01	-0.03	525.02

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59	STAR	12.16	8.47	0.02	3.00	0.67	0.01	157.85
60	TFCO	0.28	0.01	0.03	0.69	-0.45	0.03	459.43
61	BATA	-3.33	-0.76	-1.77	-2.25	1.44	-0.23	610.93
62	BIMA	-2.63	-0.20	-2.43	-1.62	1.62	-0.14	50.00
63	JECC	2.19	0.14	0.12	1.57	0.36	0.01	6,750.03
64	KBLI	-3.10	-1.50	-0.47	-2.52	1.40	-0.02	384.89
65	KBLM	1.82	0.04	0.23	1.31	0.24	0.01	257.57
66	SCCO	3.38	0.18	0.22	2.40	0.58	0.06	9,137.61
67	VOKS	2.19	0.20	0.08	1.56	0.36	0.01	273.58
68	PTSN	2.51	0.16	0.59	1.45	0.31	0.04	180.74
69	INTP	4.78	0.17	0.23	3.65	0.73	0.07	12,724.75
70	SMBR	3.29	0.06	0.30	1.61	1.31	0.02	654.93
71	SMCB	4.26	0.07	0.35	2.87	0.97	0.03	1,146.69
72	SMGR	3.79	0.08	0.45	1.91	1.36	0.03	9,875.34
73	WTON	2.89	0.08	0.07	2.19	0.54	0.01	310.55
74	AMFG	0.82	-0.05	-0.28	-0.93	2.07	-0.05	2,808.14
75	ARNA	7.40	0.66	0.48	5.45	0.82	0.16	61.94
76	IKAI	-1.99	-0.06	-1.41	-2.02	1.50	-0.06	50.45
77	KIAS	0.65	-0.04	-0.19	-1.06	1.94	-0.05	58.35
78	MLIA	2.15	0.64	0.39	1.06	0.06	0.01	509.26
79	TOTO	-2.15	0.06	0.04	0.39	-2.63	-0.01	224.03
80	ALKA	3.79	1.66	0.04	1.68	0.41	0.02	1.33
81	ALMI	-7.39	-0.56	-1.87	-6.13	1.16	-0.19	236.41
82	BAJA	4.42	0.39	0.29	3.06	0.67	0.07	3,134.41
83	BTON	1.16	0.89	0.04	0.69	-0.46	0.02	216.52
84	CTBN	-0.56	0.06	0.07	0.46	-1.16	-0.02	3,272.82
85	GDST	1.28	-0.03	-0.39	-1.05	2.75	-0.05	88.45
86	INAI	1.45	0.22	0.10	1.07	0.07	0.03	344.55
87	ISSP	3.67	0.11	0.28	2.58	0.69	0.03	141.28
88	JKSW	2.44	0.15	0.17	1.71	0.41	-0.01	0.00
89	KRAS	1.09	0.05	0.17	0.92	-0.06	0.01	364.00
90	LION	1.55	0.75	0.21	0.82	-0.22	-0.01	295.39
91	LMSH	-4.38	0.03	0.04	0.18	-4.62	-0.06	307.67
92	NIKL	2.53	0.20	0.08	1.81	0.45	0.02	785.81
93	PICO	-1.61	-0.49	-0.11	-2.42	1.41	-0.06	213.14
94	TBMS	3.48	0.53	0.04	2.33	0.57	0.03	769.35
95	BRPT	10.44	0.07	0.08	1.81	8.47	0.02	1,045.66
96	BUDI	2.58	0.09	0.21	1.83	0.45	0.02	96.40
97	DPNS	2.82	1.71	0.13	0.99	-0.01	0.01	241.85
98	EKAD	3.75	0.34	0.32	2.50	0.60	0.09	1,166.90
99	ETWA	12.72	0.24	0.68	10.86	0.94	0.07	61.72

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100	INCI	3.08	0.32	0.25	2.00	0.50	0.07	707.19
101	SRSN	3.11	0.28	0.41	1.93	0.48	0.05	56.01
102	TPIA	0.91	0.03	0.05	0.92	-0.09	0.01	7,901.28
103	UNIC	7.77	1.18	0.46	5.32	0.81	0.11	4,181.49
104	AKPI	2.27	0.07	0.16	1.65	0.40	0.02	347.00
105	APLI	0.36	0.07	0.17	0.65	-0.53	-0.02	161.90
106	BRNA	-0.91	-0.19	-0.80	-1.38	1.45	-0.10	1,018.68
107	FPNI	0.51	-0.06	-0.22	-1.07	1.87	-0.03	220.38
108	IGAR	5.98	0.58	0.21	4.37	0.82	0.09	292.90
109	IPOL	2.62	0.15	0.31	1.67	0.50	0.03	130.48
110	TALF	1.34	0.06	0.23	1.02	0.03	0.01	260.74
111	TRST	3.57	0.06	0.22	2.66	0.62	0.02	390.44
112	YPAS	3.57	0.15	0.19	2.62	0.62	0.03	408.46
113	CPIN	4.48	0.31	0.93	2.53	0.71	0.12	5,770.38
114	JPFA	-0.23	0.17	0.51	0.42	-1.33	0.05	1,174.02
115	MAIN	0.88	0.07	0.30	0.79	-0.27	-0.01	28.42
116	SIPD	2.09	0.26	0.27	1.26	0.30	0.01	1,252.13
117	SULI	-8.50	-0.30	-6.21	-3.29	1.30	-0.25	50.23
118	TIRT	-19.00	-1.41	-13.03	-5.73	1.17	-1.05	54.06
119	ALDO	2.97	0.34	0.45	1.75	0.43	0.07	438.64
120	FASW	1.60	0.05	0.26	1.15	0.14	0.03	7,136.15
121	INKP	2.55	0.10	0.11	1.88	0.47	0.03	7,807.70
122	INRU	10.93	0.05	7.60	2.65	0.62	0.01	918.44
123	KDSI	2.65	0.33	0.49	1.50	0.33	0.05	833.98
124	SPMA	5.50	0.14	0.90	3.73	0.73	0.07	216.01
125	TKIM	2.66	0.17	0.24	1.81	0.45	0.05	6,526.24

No.	Emiten	2021						
		IC					ROA	MV
		Ev-VAIC	VAPY	VAFI	VAHU	STVA		
1	ADES	6.98	0.66	0.48	5.04	0.81	0.20	2,413.35
2	AISA	3.77	0.13	0.47	1.26	1.91	0.01	252.30
3	ALTO	1.44	0.02	0.24	1.10	0.09	-0.01	313.68
4	CEKA	5.17	1.00	0.29	3.19	0.69	0.11	1,834.94
5	DLTA	6.05	3.16	0.27	2.10	0.52	0.14	3,797.75
6	ICBP	8.94	0.75	0.37	2.06	5.76	0.07	8,648.73
7	INDF	5.26	0.50	0.54	1.42	2.81	0.06	6,273.00
8	MLBI	7.20	0.59	0.86	4.94	0.80	0.23	8,061.28
9	MYOR	4.54	0.27	0.19	3.38	0.70	0.06	2,488.41
10	PSDN	6.21	-0.04	-0.22	-0.22	6.68	-0.12	171.67

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11	ROTI	3.62	0.37	0.78	1.89	0.59	0.07	1,362.35
12	SKBM	4.46	0.26	0.17	1.54	2.49	0.02	432.20
13	SKLT	3.24	0.48	0.66	1.69	0.41	0.19	2,199.15
14	STTP	5.20	0.44	0.45	3.59	0.72	0.16	7,669.74
15	ULTJ	3.44	0.30	0.15	2.40	0.59	0.17	1,549.89
16	GGRM	5.43	0.27	1.14	3.32	0.70	0.06	36,112.43
17	HMSP	4.68	1.79	0.57	1.86	0.47	0.13	1,192.55
18	RMBA	3.63	0.26	0.52	2.28	0.56	0.01	287.32
19	WIIM	4.79	1.43	0.63	2.18	0.54	0.09	735.94
20	DVLA	3.40	0.93	0.46	1.53	0.48	0.07	2,481.72
21	INAF	0.44	0.29	0.16	0.59	-0.60	-0.02	2,922.23
22	KAEF	1.36	0.19	0.67	0.75	-0.24	0.02	3,017.88
23	KLBF	4.33	0.72	0.57	2.28	0.76	0.13	1,488.20
24	MERK	4.26	1.04	0.50	2.20	0.52	0.13	3,386.82
25	PYFA	2.48	0.26	0.64	1.06	0.53	0.01	994.20
26	SCPI	4.26	0.70	0.53	2.44	0.59	0.10	0.00
27	SIDO	7.93	0.89	0.80	5.36	0.88	0.31	791.31
28	TSPC	4.19	0.75	0.46	2.39	0.58	0.09	1,430.57
29	KINO	2.12	0.21	0.31	1.22	0.38	0.02	2,327.83
30	MBTO	0.52	-0.09	-0.74	-0.53	1.89	-0.21	147.04
31	MRAT	0.71	0.91	0.31	1.13	-1.63	0.01	277.75
32	TCID	1.32	0.24	0.19	0.70	0.19	-0.03	2,990.69
33	UNVR	5.44	0.68	1.39	2.66	0.70	0.30	4,943.75
34	CINT	-1.70	-0.12	-0.59	-0.97	-0.01	-0.20	262.10
35	KICI	3.28	1.07	1.09	2.92	-1.80	0.12	275.90
36	LMPI	3.18	0.08	0.26	0.54	2.30	-0.02	167.95
37	ASII	3.71	0.52	0.36	2.14	0.68	0.07	5,486.71
38	AUTO	2.68	0.39	0.38	1.77	0.13	0.04	1,138.60
39	BRAM	4.50	0.25	0.73	2.82	0.69	0.09	7,016.50
40	GDYR	1.89	0.08	0.20	1.23	0.39	0.02	2,088.73
41	GJTL	1.71	0.09	0.15	1.26	0.21	0.00	799.05
42	IMAS	2.98	0.14	0.12	2.18	0.54	-0.01	1,052.21
43	INDS	4.18	0.17	0.50	2.86	0.65	0.05	1,912.49
44	LPIN	7.00	4.33	0.84	1.49	0.33	0.08	969.80
45	MASA	8.17	0.22	0.46	6.62	0.86	0.10	3,216.08
46	PRAS	1.07	0.02	0.13	0.96	-0.04	-0.01	222.79
47	SMSM	26.52	5.92	2.87	16.79	0.94	0.19	1,327.09
48	ADMG	-0.17	0.05	0.14	0.53	-0.89	0.02	192.54
49	ARGO	-4.83	-0.03	-0.49	-5.49	1.18	-0.03	1,738.93
50	ERTX	1.68	0.06	0.16	0.97	0.49	0.02	193.72
51	ESTI	-11.69	-0.41	-3.14	-9.25	1.11	0.03	110.74
52	INDR	11.14	0.21	0.57	9.46	0.89	0.09	4,130.19
53	MYTX	-2.60	-0.04	-0.90	-3.00	1.33	-0.04	99.25

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54	PBRX	4.72	0.49	0.24	3.24	0.76	0.02	160.95
55	POLY	2.40	0.26	0.22	1.56	0.36	0.01	71.08
56	RICY	-2.11	0.08	0.04	0.28	-2.52	-0.04	90.16
57	SRIL	-11.71	-1.13	-4.39	-7.33	1.14	-0.87	187.47
58	SSTM	13.10	0.32	5.25	6.69	0.85	0.12	659.11
59	STAR	16.59	11.28	0.27	4.27	0.77	0.02	92.47
60	TFCO	8.40	0.09	1.17	6.29	0.84	0.04	675.94
61	BATA	0.13	0.20	1.38	0.31	-1.76	-0.08	591.56
62	BIMA	-2.70	-0.19	-2.68	-1.40	1.57	-0.09	165.21
63	JECC	1.93	-0.05	-0.05	-0.61	2.65	0.03	6,892.09
64	KBLI	1.31	0.31	0.11	0.94	-0.06	0.03	339.65
65	KBLM	-4.47	0.00	0.01	0.18	-4.67	-0.01	208.47
66	SCCO	4.33	0.05	0.10	3.46	0.71	0.03	10,671.09
67	VOKS	-1.17	-0.30	-0.13	-2.20	1.45	-0.07	193.03
68	PTSN	2.46	0.16	0.36	1.58	0.37	0.03	267.70
69	INTP	5.69	0.16	0.26	4.49	0.78	0.07	11,602.61
70	SMBR	2.72	0.05	0.24	1.29	1.14	0.01	775.75
71	SMCB	4.17	0.07	0.28	2.86	0.96	0.03	1,742.94
72	SMGR	4.02	0.07	0.40	2.10	1.45	0.03	8,761.65
73	WTON	2.51	0.05	0.05	1.93	0.48	0.01	305.15
74	AMFG	1.57	0.01	0.28	0.25	1.03	0.04	4,069.74
75	ARNA	10.22	0.93	0.55	7.87	0.87	0.21	755.00
76	IKAI	1.69	-0.03	-0.09	-0.67	2.48	-0.05	50.00
77	KIAS	1.71	0.01	0.04	1.38	0.28	-0.01	50.27
78	MLIA	5.55	0.20	0.73	3.88	0.74	0.11	265.22
79	TOTO	3.98	0.42	0.29	2.64	0.62	0.05	213.66
80	ALKA	5.96	2.56	0.06	2.71	0.63	0.03	289.19
81	ALMI	-6.52	-0.13	-0.21	-7.33	1.14	0.04	255.53
82	BAJA	6.45	0.58	0.51	4.59	0.78	0.12	365.56
83	BTON	0.53	1.02	0.04	0.49	-1.02	0.04	399.85
84	CTBN	1.17	-0.10	-0.17	-0.81	2.24	-0.12	3,085.00
85	GDST	4.07	-0.02	-0.19	-0.28	4.55	0.04	105.14
86	INAI	1.42	0.12	0.07	1.12	0.11	0.03	316.89
87	ISSP	7.18	0.19	0.58	5.57	0.84	0.07	285.94
88	JKSW	1.76	0.16	0.14	1.26	0.20	-0.03	0.00
89	KRAS	2.99	0.05	0.21	2.16	0.57	0.01	583.98
90	LION	1.35	0.42	0.19	0.88	-0.14	-0.01	358.04
91	LMSH	2.69	0.25	0.31	1.72	0.42	0.04	784.05
92	NIKL	4.05	0.34	0.08	2.96	0.66	0.03	1,160.42
93	PICO	-2.22	-0.37	-0.29	-2.90	1.34	-0.05	127.77
94	TBMS	6.18	1.10	0.11	4.21	0.76	0.05	1,179.14

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95	BRPT	8.80	0.13	0.10	3.37	5.21	0.03	955.49
96	BUDI	3.33	0.12	0.22	2.41	0.58	0.03	182.71
97	DPNS	5.82	3.05	0.28	1.99	0.50	0.06	342.71
98	EKAD	4.07	0.39	0.33	2.72	0.63	0.09	275.31
99	ETWA	-8.91	-0.24	-0.63	-9.11	1.08	-0.12	0.00
100	INCI	2.24	0.17	0.12	1.58	0.37	0.02	788.90
101	SRSN	2.57	0.20	0.28	1.68	0.41	0.03	59.35
102	TPIA	3.58	0.09	0.07	2.78	0.64	0.03	2,163.21
103	UNIC	8.68	1.66	0.52	5.67	0.82	0.20	8,154.25
104	AKPI	3.78	0.13	0.35	2.68	0.63	0.04	775.81
105	APLI	1.45	0.10	0.21	1.08	0.07	0.05	199.78
106	BRNA	-1.38	-0.16	-0.98	-1.75	1.50	-0.10	1,275.10
107	FPNI	4.56	0.22	0.28	3.34	0.72	0.05	305.61
108	IGAR	6.78	1.05	0.27	4.65	0.81	0.13	415.14
109	IPOL	2.59	0.16	0.31	1.64	0.48	0.03	165.99
110	TALF	1.49	0.06	0.23	1.11	0.10	0.01	303.69
111	TRST	6.26	0.10	0.31	5.05	0.80	0.04	758.01
112	YPAS	1.74	-0.04	-0.05	-0.67	2.50	-0.04	729.72
113	CPIN	4.35	0.32	1.37	2.57	0.09	0.10	6,350.79
114	JPFA	2.24	0.30	0.95	0.86	0.12	0.10	1,747.32
115	MAIN	2.84	0.16	0.55	1.72	0.42	0.01	758.01
116	SIPD	1.61	0.23	0.20	1.02	0.16	-0.04	1,725.14
117	SULI	2.90	0.12	1.38	1.22	0.18	0.04	51.00
118	TIRT	-16.25	-0.51	-6.62	-10.23	1.10	-0.45	87.84
119	ALDO	3.70	0.35	0.42	2.35	0.57	0.08	820.54
120	FASW	2.49	0.06	0.24	1.75	0.43	0.05	7,600.00
121	INKP	5.03	0.16	0.16	3.96	0.75	0.06	9,393.22
122	INRU	2.65	0.02	1.04	1.34	0.25	0.01	718.55
123	KDSI	2.77	0.35	0.41	1.62	0.38	0.05	903.22
124	SPMA	7.60	0.21	0.80	5.76	0.83	0.11	441.89
125	TKIM	5.55	0.29	0.46	4.05	0.75	0.08	9,985.87

No.	Emiten	2022						
		IC					ROA	MV
		Ev-VAIC	VAPY	VAFI	VAHU	STVA		
1	ADES	8.24	0.61	0.62	6.17	0.84	0.22	5,972.83
2	AISA	2.79	0.10	0.27	0.65	1.78	-0.03	169.72
3	ALTO	-0.40	0.01	0.16	0.49	-1.05	-0.02	70.17
4	CEKA	5.14	1.04	0.29	3.14	0.68	0.13	2,242.75
5	DLTA	6.98	3.66	0.32	2.41	0.59	0.18	3,850.30

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6	ICBP	8.97	0.84	0.51	2.46	5.17	0.05	8,687.76
7	INDF	6.34	0.42	0.50	2.01	3.42	0.05	6,429.39
8	MLBI	8.44	0.76	0.86	5.99	0.83	0.27	9,214.93
9	MYOR	6.13	0.38	0.25	4.71	0.79	0.15	1,965.27
10	PSDN	3.07	0.23	1.57	1.15	0.13	-0.04	107.18
11	ROTI	4.72	0.43	0.94	2.25	1.10	0.10	1,299.24
12	SKBM	4.56	0.42	0.24	2.04	1.85	0.04	384.70
13	SKLT	3.02	0.50	0.70	1.49	0.32	0.15	2,092.20
14	STTP	5.18	0.48	0.35	3.62	0.72	0.14	7,584.15
15	ULTJ	5.97	0.52	0.40	4.28	0.77	0.13	1,477.62
16	GGRM	3.57	0.17	0.80	2.09	0.52	0.03	25,284.25
17	HMSP	5.38	1.58	1.70	1.68	0.41	0.12	969.47
18	RMBA	5.14	0.36	0.70	3.38	0.70	0.11	0.00
19	WIIM	5.14	1.71	0.53	2.32	0.58	0.12	614.35
20	DVLA	4.46	0.97	1.53	1.49	0.46	0.07	2,619.08
21	INAF	-1.67	-0.76	-0.69	-1.77	1.54	-0.28	1,333.28
22	KAEF	0.81	0.13	0.32	0.68	-0.33	-0.01	1,625.68
23	KLBF	4.80	0.79	0.69	2.48	0.84	0.13	1,772.96
24	MERK	5.36	1.33	0.71	2.69	0.63	0.17	4,529.15
25	PYFA	4.34	0.37	1.08	2.28	0.60	0.18	997.92
26	SCPI	5.93	0.91	0.74	3.27	1.00	0.13	0.00
27	SIDO	5.84	0.80	0.80	3.46	0.78	0.27	832.98
28	TSPC	4.49	0.72	0.41	2.73	0.63	0.09	1,423.78
29	KINO	0.72	-0.16	-0.24	-0.85	1.98	-0.20	3,068.49
30	MBTO	0.96	0.09	0.51	0.48	-0.12	-0.06	125.34
31	MRAT	5.11	2.49	0.33	1.83	0.45	0.10	346.07
32	TCID	1.99	0.42	0.30	1.12	0.14	0.01	2,773.08
33	UNVR	5.69	0.68	1.37	2.90	0.73	0.29	4,417.03
34	CINT	2.24	0.17	0.86	1.11	0.11	-0.02	225.86
35	KICI	1.89	0.42	0.56	0.95	-0.05	0.01	231.41
36	LMPI	-4.37	0.03	0.06	0.18	-4.63	-0.04	173.59
37	ASII	4.71	0.71	0.51	2.74	0.75	0.10	6,451.68
38	AUTO	3.93	0.60	0.47	2.78	0.08	0.08	1,217.34
39	BRAM	5.16	0.33	0.75	3.34	0.74	0.12	10,054.73
40	GDYR	-0.12	0.04	0.08	0.54	-0.78	-0.13	1,360.00
41	GJTL	1.67	0.09	0.15	1.24	0.19	-0.01	654.23
42	IMAS	3.52	0.17	0.13	2.60	0.62	0.01	831.31
43	INDS	3.64	0.16	0.41	2.48	0.60	0.06	2,132.64
44	LPIN	8.31	5.18	0.57	2.05	0.51	0.08	524.59
45	MASA	9.72	0.27	0.89	7.67	0.89	0.11	3,127.75
46	PRAS	0.27	-0.02	-0.31	-1.12	1.73	-0.06	235.10
47	SMSM	6.89	1.23	0.59	4.29	0.78	0.21	1,426.32
48	ADMG	-1.08	-0.10	-0.38	-2.08	1.48	-0.16	176.63

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49	ARGO	-5.98	-0.04	-0.48	-6.60	1.15	-0.09	1,382.57
50	ERTX	4.31	0.17	0.37	3.09	0.69	0.05	421.02
51	ESTI	2.03	0.07	0.60	1.20	0.17	0.01	90.77
52	INDR	7.62	0.12	0.54	6.11	0.84	0.05	7,958.65
53	MYTX	0.22	0.01	0.17	0.63	-0.59	-0.01	74.26
54	PBRX	1.77	0.18	0.06	1.19	0.34	0.03	123.26
55	POLY	3.47	0.34	0.32	2.23	0.58	0.05	85.65
56	RICY	0.69	0.23	0.10	0.73	-0.37	-0.04	105.20
57	SRIL	-9.37	-0.84	-4.44	-5.28	1.19	-0.52	0.00
58	SSTM	-1.44	0.01	0.78	0.28	-2.51	-0.01	770.98
59	STAR	11.89	10.07	0.01	1.49	0.33	0.03	148.24
60	TFCO	4.14	0.05	0.21	3.18	0.69	0.01	697.20
61	BATA	2.92	-0.10	-0.66	-0.27	3.95	-0.15	503.61
62	BIMA	3.64	0.13	2.14	1.17	0.20	-0.01	261.67
63	JECC	2.69	0.25	0.13	1.88	0.42	0.03	4,910.28
64	KBLI	1.00	0.34	0.11	0.80	-0.24	0.02	317.63
65	KBLM	4.16	0.05	0.20	2.91	1.00	0.02	256.21
66	SCCO	1.98	0.06	0.15	1.46	0.31	0.02	9,175.33
67	VOKS	-0.96	-0.24	-0.11	-2.08	1.48	-0.07	164.39
68	PTSN	3.75	0.18	0.54	2.44	0.59	0.07	214.65
69	INTP	4.96	0.17	0.34	3.72	0.73	0.07	9,904.99
70	SMBR	2.20	0.07	0.31	1.44	0.38	0.02	475.46
71	SMCB	5.13	0.08	0.36	3.69	1.02	0.04	1,601.52
72	SMGR	4.10	0.08	0.37	2.24	1.41	0.03	7,017.30
73	WTON	3.71	0.08	0.06	2.92	0.66	0.02	215.04
74	AMFG	6.05	0.14	2.44	2.82	0.65	0.06	5,717.20
75	ARNA	11.23	0.90	0.63	8.81	0.89	0.23	966.03
76	IKAI	-1.55	0.02	0.06	0.34	-1.96	-0.03	50.00
77	KIAS	1.49	0.02	0.05	1.23	0.19	0.01	50.00
78	MLIA	6.37	0.24	0.68	4.66	0.79	0.13	505.66
79	TOTO	6.47	0.55	0.44	4.69	0.79	0.09	261.01
80	ALKA	13.62	4.98	0.09	7.68	0.87	0.08	289.19
81	ALMI	-5.89	-0.11	-1.25	-5.70	1.18	-0.04	339.29
82	BAJA	-6.18	-0.46	-0.42	-6.67	1.38	-0.14	195.77
83	BTON	9.12	5.27	0.14	3.04	0.67	0.12	379.87
84	CTBN	14.41	-0.01	-0.02	-0.07	14.51	-0.05	2,113.69
85	GDST	5.34	0.20	0.47	3.92	0.74	0.13	178.22
86	INAI	-0.03	-0.21	-0.12	-1.41	1.71	-0.07	293.74
87	ISSP	7.50	0.23	0.48	5.95	0.85	0.04	344.22
88	JKSW	2.72	0.24	0.26	1.79	0.44	0.02	0.00
89	KRAS	6.35	0.18	0.54	4.83	0.80	0.01	385.32

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90	LION	2.72	1.35	0.31	1.03	0.03	0.03	435.89
91	LMSH	-1.94	0.04	0.04	0.30	-2.32	0.04	695.43
92	NIKL	5.84	0.49	0.11	4.47	0.78	0.04	852.68
93	PICO	1.60	0.14	0.10	1.19	0.16	0.01	304.50
94	TBMS	6.17	1.17	0.11	4.13	0.76	0.04	1,666.55
95	BRPT	16.57	0.03	0.03	0.84	15.66	0.00	823.86
96	BUDI	3.19	0.13	0.22	2.28	0.56	0.03	217.90
97	DPNS	6.83	4.13	0.32	1.91	0.48	0.07	394.05
98	EKAD	3.31	0.31	0.25	2.21	0.55	0.06	284.26
99	ETWA	-1.30	-0.05	-0.17	-2.37	1.30	-0.32	203.21
100	INCI	3.32	0.22	0.19	2.34	0.57	0.05	643.96
101	SRSN	2.81	0.23	0.40	1.74	0.43	0.04	59.20
102	TPIA	-0.85	-0.07	-0.06	-2.18	1.46	-0.03	2,400.13
103	UNIC	7.08	1.33	0.40	4.56	0.78	0.12	12,024.52
104	AKPI	4.78	0.15	0.41	3.51	0.72	0.06	1,453.42
105	APLI	3.97	0.34	0.46	2.56	0.61	0.10	243.04
106	BRNA	-1.06	-0.15	-0.91	-1.58	1.58	-0.07	1,010.87
107	FPNI	3.51	0.13	0.16	2.58	0.63	0.02	397.90
108	IGAR	6.89	1.12	0.30	4.67	0.80	0.12	500.06
109	IPOL	4.53	0.32	0.70	2.82	0.69	0.01	153.28
110	TALF	2.44	0.07	0.29	1.67	0.41	0.02	318.42
111	TRST	6.71	0.06	0.28	5.55	0.82	0.03	625.62
112	YPAS	1.08	0.06	0.07	0.98	-0.02	-0.01	691.47
113	CPIN	3.65	0.24	0.93	1.90	0.58	0.07	5,681.77
114	JPFA	1.29	0.17	0.49	0.54	0.09	0.06	1,507.89
115	MAIN	3.31	0.11	0.27	2.36	0.58	0.01	625.62
116	SIPD	1.01	0.18	0.14	0.79	-0.10	-0.07	1,689.78
117	SULI	25.61	1.16	14.03	9.53	0.90	0.62	103.19
118	TIRT	-6.72	-0.18	-2.86	-4.88	1.21	-0.34	109.00
119	ALDO	1.03	0.08	0.23	0.87	-0.15	0.04	1,071.71
120	FASW	0.66	0.03	0.16	0.76	-0.29	0.01	6,526.88
121	INKP	7.31	0.28	0.21	5.99	0.83	0.09	8,418.13
122	INRU	1.24	0.02	0.24	0.99	-0.01	-0.04	643.57
123	KDSI	3.15	0.33	0.44	1.90	0.47	0.06	1,042.44
124	SPMA	9.66	0.27	0.86	7.66	0.87	0.10	592.33
125	TKIM	10.79	0.55	0.78	8.58	0.88	0.13	7,238.50

APPENDIX: B

1.) **Figure 1**: The Intellectual capital components for Manufacturing sector

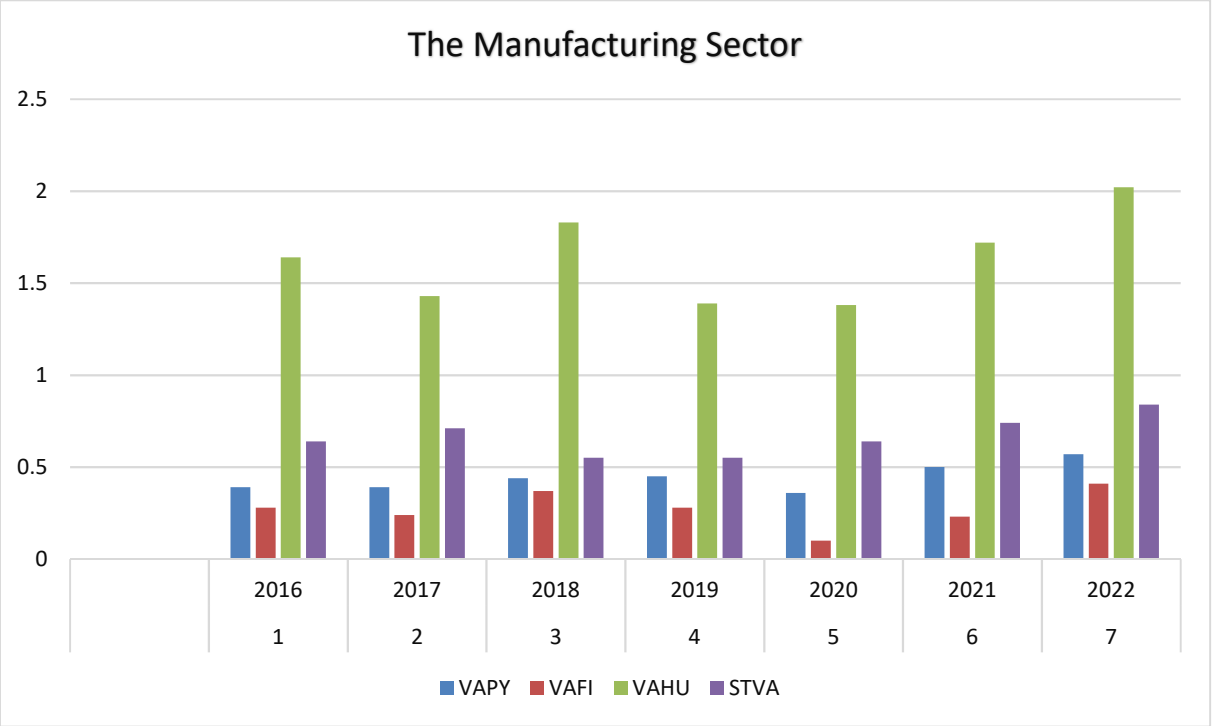

Table 1: The Value of VAPY, VAFI, VAHU and STVA (average)

No.	Year	VAPY	VAFI	VAHU	STVA
1	2016	0.39	0.28	1.64	0.64
2	2017	0.39	0.24	1.43	0.71
3	2018	0.44	0.37	1.83	0.55
4	2019	0.45	0.28	1.39	0.55
5	2020	0.36	0.10	1.38	0.64
6	2021	0.50	0.23	1.72	0.74
7	2022	0.57	0.41	2.02	0.84

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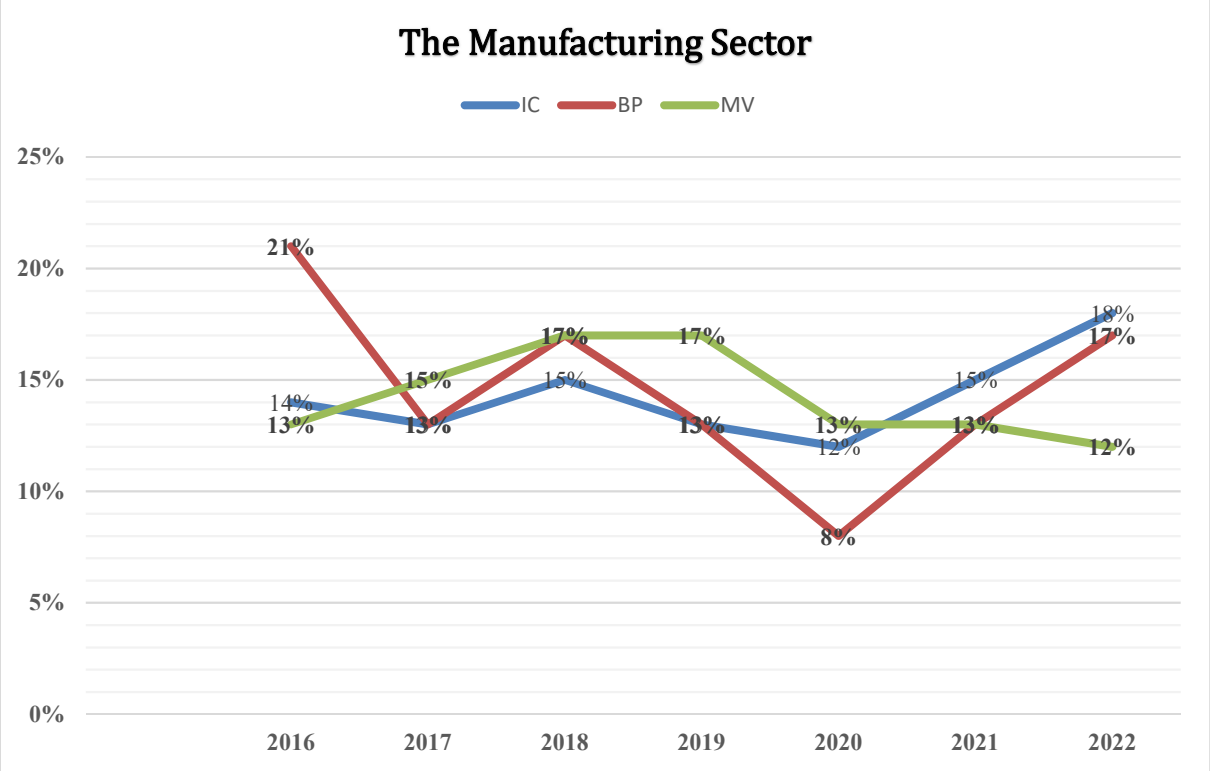
2.) **Table 2**: The value of IC – BP – MV (average)

No.	Year	IC	BP	MV	IC	BP	MV
1	2016	2.95	0.05	2,222.10	14%	21%	13%
2	2017	2.77	0.03	2,563.24	13%	13%	15%
3	2018	3.20	0.04	2,819.69	15%	17%	17%
4	2019	2.67	0.03	2,757.06	13%	13%	17%
5	2020	2.48	0.02	2,110.50	12%	8%	13%
6	2021	3.19	0.03	2,114.43	15%	13%	13%
7	2022	3.84	0.04	2,040.39	18%	17%	12%

Figure 2: The IC – BP – MV for Manufacturing Sector



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3.) **Table 3:** The value of Intellectual capital (2016 – 2022)

No.	Yearly	Average	Max	Min	Median	Std. Dev.
1	2016	2.95	12.92	-15.70	3.05	3.78
2	2017	2.77	20.77	-12.51	2.78	3.77
3	2018	3.30	21.86	-5.82	3.18	3.12
4	2019	2.67	14.23	-9.69	2.77	3.37
5	2020	2.48	12.72	-19.00	2.53	3.98
6	2021	3.19	26.52	-16.25	3.33	4.75
7	2022	3.84	25.61	-9.37	3.71	4.45

4.) **Table 6:** The Intellectual capital (average) of three sectors

No.	Year	IC - Value		
		Consumer Goods Industry	Miscellaneous Industry	Basic Industries & chemicals
1	2016	4.24	3.03	2.08
2	2017	3.81	2.1	2.48
3	2018	3.93	3.15	2.76
4	2019	4.28	2.38	1.81
5	2020	4.14	1.45	2.00
6	2021	3.93	2.85	2.91
7	2022	4.08	2.66	4.34

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Figure 3a: IC - The Consumer Goods Industry

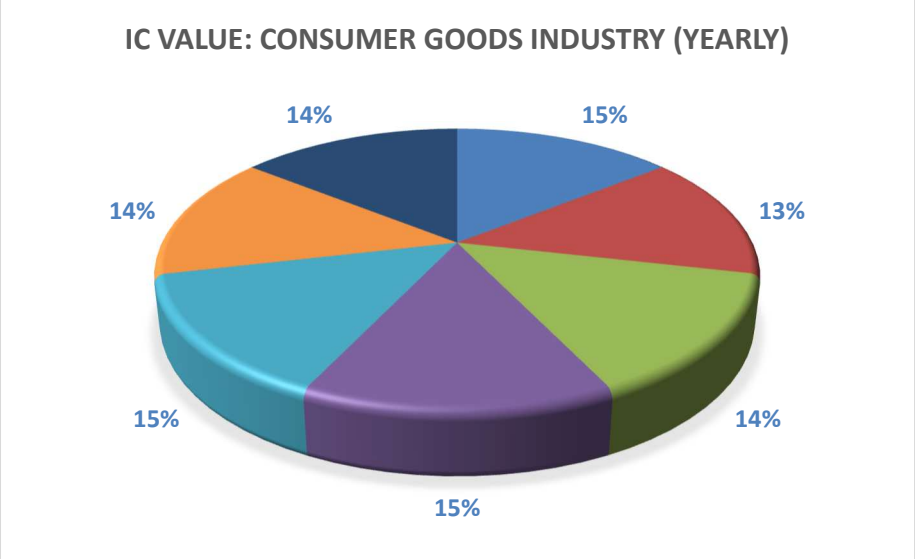

Figure 3b: IC - The Miscellaneous Industry

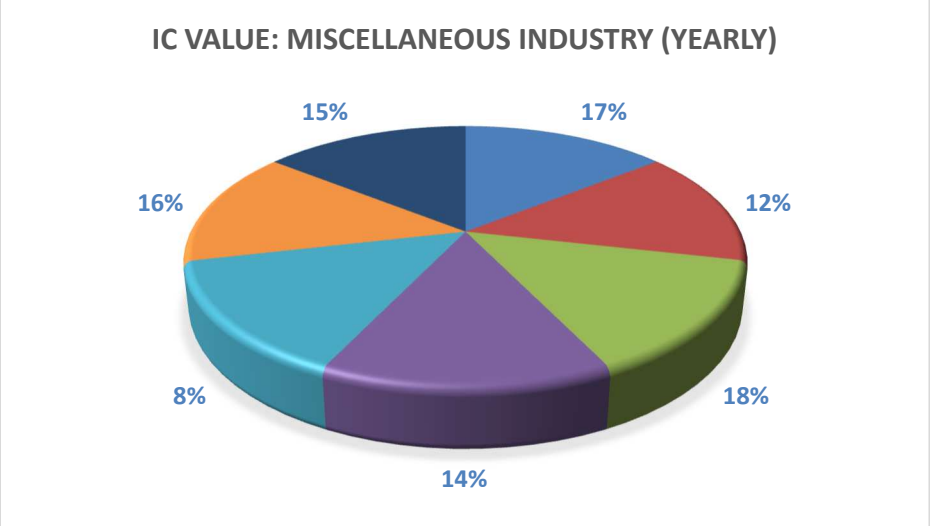

Figure 3c: IC – The Basic Industry & Chemicals

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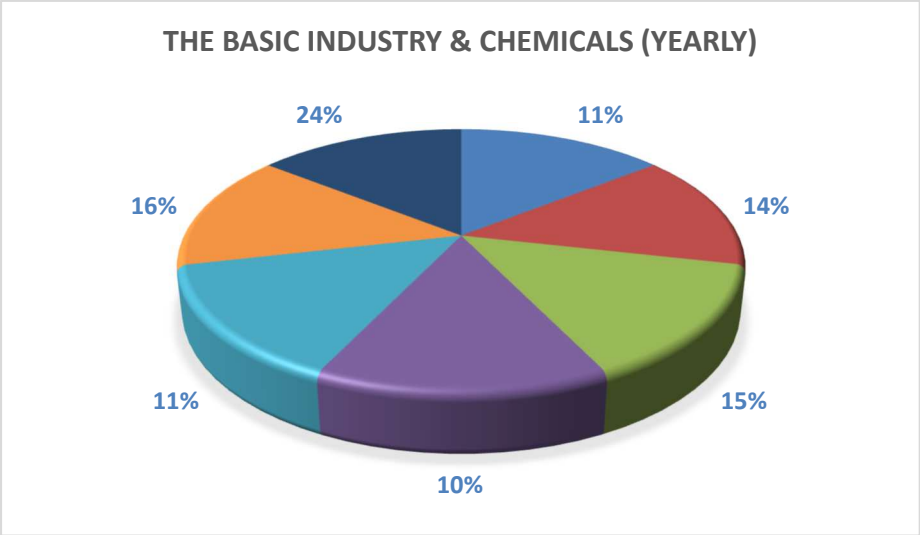
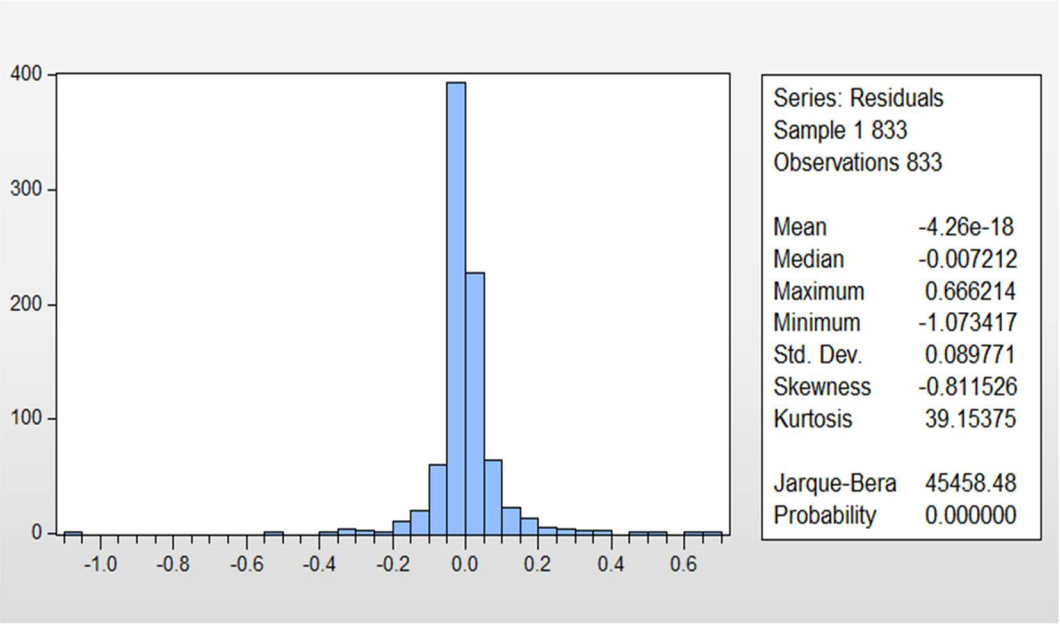


APPENDIX: C

PENGUJIAN HYPOTHESIS

MODEL 1 (H1): IC → ROA

1. NORMALITAS



2. HETEROSKEDASTICITAS

Heteroskedasticity Test: Glejser

F-statistic	21.47473	Prob. F(5,827)	0.0000
Obs*R-squared	95.72430	Prob. Chi-Square(5)	0.0000
Scaled explained SS	127.3217	Prob. Chi-Square(5)	0.0000

Test Equation:
Dependent Variable: ARESID
Method: Least Squares
Date: 02/18/25 Time: 10:28
Sample: 1 833
Included observations: 833

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1192.734	60.58199	19.68792	0.0000
ROA	2448.272	523.4394	4.677279	0.0000
VAPY	-100.2122	51.14576	-1.959346	0.0504
VAFI	-152.0641	51.50819	-2.952231	0.0032
VAHU	150.1758	24.71559	6.076157	0.0000
STVA	67.90795	28.07435	2.418861	0.0158

R-squared	0.114915	Mean dependent var	1473.812
Adjusted R-squared	0.109564	S.D. dependent var	1436.363
S.E. of regression	1355.395	Akaike info criterion	17.26875
Sum squared resid	1.52E+09	Schwarz criterion	17.30278
Log likelihood	-7186.434	Hannan-Quinn criter.	17.28180
F-statistic	21.47473	Durbin-Watson stat	0.756010
Prob(F-statistic)	0.000000		

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3. AUTOKORELASI

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	33.75161	Prob. F(2,826)	0.0000
Obs*R-squared	62.93227	Prob. Chi-Square(2)	0.0000

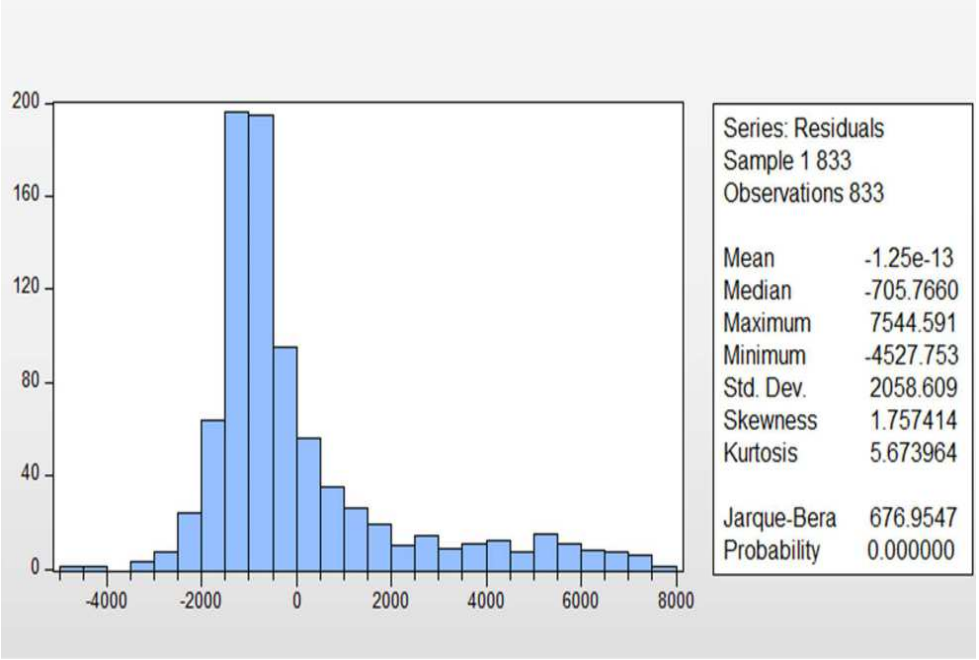
4. MULTIKOLINEARITAS

Variance Inflation Factors
Date: 02/18/25 Time: 10:27
Sample: 1 833
Included observations: 833

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
VAPY	1.11E-05	1.353228	1.128866
VAFI	9.75E-06	1.467426	1.404038
VAHU	2.38E-06	2.092124	1.505113
STVA	3.47E-06	1.163555	1.008873
C	1.61E-05	1.657353	NA

MODEL 2 (H2): IC → MV

1. NORMALITAS



APPENDIX: C

2. HETEROSKEDASTICITAS

Heteroskedasticity Test: Glejser

F-statistic	21.47473	Prob. F(5,827)	0.0000
Obs*R-squared	95.72430	Prob. Chi-Square(5)	0.0000
Scaled explained SS	127.3217	Prob. Chi-Square(5)	0.0000

Test Equation:
Dependent Variable: ARESID
Method: Least Squares
Date: 02/18/25 Time: 10:28
Sample: 1 833
Included observations: 833

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1192.734	60.58199	19.68792	0.0000
ROA	2448.272	523.4394	4.677279	0.0000
VAPY	-100.2122	51.14576	-1.959346	0.0504
VAFI	-152.0641	51.50819	-2.952231	0.0032
VAHU	150.1758	24.71559	6.076157	0.0000
STVA	67.90795	28.07435	2.418861	0.0158

R-squared	0.114915	Mean dependent var	1473.812
Adjusted R-squared	0.109564	S.D. dependent var	1436.363
S.E. of regression	1355.395	Akaike info criterion	17.26875
Sum squared resid	1.52E+09	Schwarz criterion	17.30278
Log likelihood	-7186.434	Hannan-Quinn criter.	17.28180
F-statistic	21.47473	Durbin-Watson stat	0.756010
Prob(F-statistic)	0.000000		

3. AUTOKORELASI

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	485.3576	Prob. F(2,825)	0.0000
Obs*R-squared	450.2973	Prob. Chi-Square(2)	0.0000

4. MULTIKOLINEARITAS

Variance Inflation Factors
Date: 02/18/25 Time: 10:29
Sample: 1 833
Included observations: 833

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
ROA	635868.1	2.044122	1.888268
VAPY	6070.904	1.410010	1.176234
VAFI	6157.250	1.760020	1.683992
VAHU	1417.674	2.363990	1.700698
STVA	1829.168	1.164064	1.009314
C	8517.679	1.664182	NA

APPENDIX D: THE RESULTS OF DATA PROCESSING BY EVIEWS

MODEL 1 (H1) : INTELLECTUAL CAPITAL (IC) ON BUSSINES PERFORMANCE (ROA)

1. Panel Regression Model Estimation Results

a. Fixed Effects Model (FEM)

Dependent Variable: ROA
Method: Panel Least Squares
Sample: 2016 2022
Periods included: 7
Cross-sections included: 123
Total panel (unbalanced) observations: 833

Variable	Coefficient	Std. Error	t-Statistic	Prob.
VAPY	0.010489	0.004927	2.128841	0.0336
VAFI	0.039287	0.003134	12.53509	0.0000
VAHU	0.009364	0.001851	5.057839	0.0000
STVA	-0.002701	0.002049	-1.317912	0.1880
C	0.008173	0.004166	1.961623	0.0502

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.647745	Mean dependent var	0.035419
Adjusted R-squared	0.584878	S.D. dependent var	0.123359
S.E. of regression	0.079480	Akaike info criterion	-2.087122
Sum squared resid	4.459839	Schwarz criterion	-1.366739
Log likelihood	996.2863	Hannan-Quinn criter.	-1.810912
F-statistic	10.30342	Durbin-Watson stat	2.184384
Prob(F-statistic)	0.000000		

b. Random Effects Model (REM)

Dependent Variable: ROA
Method: Panel EGLS (Cross-section random effects)
Sample: 2016 2022
Periods included: 7
Cross-sections included: 123
Total panel (unbalanced) observations: 833
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
VAPY	0.016535	0.003752	4.406582	0.0000
VAFI	0.039437	0.002965	13.30240	0.0000
VAHU	0.013234	0.001590	8.321561	0.0000
STVA	-0.001752	0.001851	-0.946686	0.3441
C	-0.000652	0.005084	-0.128284	0.8980

Effects Specification	S.D.	Rho
Cross-section random	0.036953	0.1777
Idiosyncratic random	0.079480	0.8223

Weighted Statistics

R-squared	0.408052	Mean dependent var	0.022805
Adjusted R-squared	0.405192	S.D. dependent var	0.105223
S.E. of regression	0.081095	Sum squared resid	5.445220
F-statistic	142.6928	Durbin-Watson stat	1.832502
Prob(F-statistic)	0.000000		

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Unweighted Statistics			
R-squared	0.465243	Mean dependent var	0.035419
Sum squared resid	6.770464	Durbin-Watson stat	1.473810

c. Common Effects Model (CEM)

Dependent Variable: ROA
Method: Panel Least Squares
Sample: 2016 2022
Periods included: 7
Cross-sections included: 123
Total panel (unbalanced) observations: 833

Variable	Coefficient	Std. Error	t-Statistic	Prob.
VAPY	0.019608	0.003327	5.894349	0.0000
VAFI	0.040122	0.003123	12.84900	0.0000
VAHU	0.016013	0.001544	10.37287	0.0000
STVA	-0.001121	0.001864	-0.601543	0.5476
C	-0.007414	0.004014	-1.847030	0.0651

R-squared	0.470414	Mean dependent var	0.035419
Adjusted R-squared	0.467856	S.D. dependent var	0.123359
S.E. of regression	0.089988	Akaike info criterion	-1.972299
Sum squared resid	6.704997	Schwarz criterion	-1.943937
Log likelihood	826.4624	Hannan-Quinn criter.	-1.961424
F-statistic	183.8714	Durbin-Watson stat	1.534471
Prob(F-statistic)	0.000000		

2. Panel Regression Model Selection Results

a. Chow Test

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	2.913215	(122,706)	0.0000
Cross-section Chi-square	339.647670	122	0.0000

b. Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	38.636592	4	0.0000

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c. Lagrange Multiplier (LM) Test

Sample: 2016 2022
Total panel observations: 833
Probability in ()

Null (no rand. effect) Alternative	Cross-section One-sided	Period One-sided	Both
Breusch-Pagan	81.67708 (0.0000)	3.492130 (0.0617)	85.16921 (0.0000)
Honda	9.037537 (0.0000)	1.868724 (0.0308)	7.711891 (0.0000)

3. Results of Panel Regression Analysis Model 1

Dependent Variable: ROA
Method: Panel EGLS (Cross-section weights)
Sample: 2016 2022
Periods included: 7
Cross-sections included: 123
Total panel (unbalanced) observations: 833
Linear estimation after one-step weighting matrix
Cross-section weights (PCSE) standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
VAPY	0.014673	0.002735	5.365947	0.0000
VAFI	0.036505	0.001381	26.43598	0.0000
VAHU	0.010715	0.000559	19.18250	0.0000
STVA	-0.001451	0.000556	-2.609661	0.0093
C	0.004102	0.001306	3.141052	0.0018

Effects Specification
Cross-section fixed (dummy variables)

Weighted Statistics			
R-squared	0.895649	Mean dependent var	0.142297
Adjusted R-squared	0.877026	S.D. dependent var	0.247504
S.E. of regression	0.078419	Sum squared resid	4.341533
F-statistic	48.09254	Durbin-Watson stat	1.884415
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.646577	Mean dependent var	0.035419
Sum squared resid	4.474630	Durbin-Watson stat	2.174727

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MODEL 2 (H2) : INTELLECTUAL CAPITAL (IC) ON MARKET VALUE (MV)

1. Panel Regression Model Estimation Results

a. Fixed Effects Model (FEM)

Dependent Variable: MV
Method: Panel Least Squares
Sample: 2016 2022
Periods included: 7
Cross-sections included: 123
Total panel (unbalanced) observations: 833

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	340.3005	410.2969	0.829401	0.4072
VAPY	8.773744	53.88769	0.162815	0.8707
VAFI	-54.87711	37.77930	-1.452571	0.1468
VAHU	99.08267	20.54561	4.822571	0.0000
STVA	0.793646	22.37016	0.035478	0.9717
C	1363.627	45.54505	29.94018	0.0000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.868284	Mean dependent var	1519.630
Adjusted R-squared	0.844556	S.D. dependent var	2197.714
S.E. of regression	866.4786	Akaike info criterion	16.50724
Sum squared resid	5.29E+08	Schwarz criterion	17.23329
Log likelihood	-6747.265	Hannan-Quinn criter.	16.78562
F-statistic	36.59386	Durbin-Watson stat	1.150206
Prob(F-statistic)	0.000000		

b. Random Effects Model (REM)

Dependent Variable: MV
Method: Panel EGLS (Cross-section random effects)
Sample: 2016 2022
Periods included: 7
Cross-sections included: 123
Total panel (unbalanced) observations: 833
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	639.4119	406.3131	1.573693	0.1159
VAPY	0.092473	52.42644	0.001764	0.9986
VAFI	-67.03749	37.56437	-1.784603	0.0747
VAHU	108.5808	20.28130	5.353741	0.0000
STVA	5.766287	22.16355	0.260170	0.7948
C	1492.058	169.5323	8.801023	0.0000

Effects Specification

	S.D.	Rho
Cross-section random	1810.643	0.8137
Idiosyncratic random	866.4786	0.1863

Weighted Statistics

R-squared	0.048177	Mean dependent var	286.5311
Adjusted R-squared	0.042422	S.D. dependent var	915.5243
S.E. of regression	890.7627	Sum squared resid	6.56E+08
F-statistic	8.371816	Durbin-Watson stat	0.938625

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d. Common Effects Model (CEM)

Dependent Variable: MV
Method: Panel Least Squares
Sample: 2016 2022
Periods included: 7
Cross-sections included: 123
Total panel (unbalanced) observations: 833

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	4949.788	797.4134	6.207305	0.0000
VAPY	-124.3710	77.91601	-1.596219	0.1108
VAFI	-215.4640	78.46815	-2.745879	0.0062
VAHU	180.8300	37.65201	4.802665	0.0000
STVA	60.84442	42.76878	1.422636	0.1552
C	1133.826	92.29127	12.28530	0.0000

R-squared	0.122585	Mean dependent var	1519.630
Adjusted R-squared	0.117280	S.D. dependent var	2197.714
S.E. of regression	2064.823	Akaike info criterion	18.11065
Sum squared resid	3.53E+09	Schwarz criterion	18.14469
Log likelihood	-7537.087	Hannan-Quinn criter.	18.12370
F-statistic	23.10821	Durbin-Watson stat	0.260543
Prob(F-statistic)	0.000000		

2. Panel Regression Model Selection Results

a. Chow Test

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	32.715538	(122,705)	0.0000
Cross-section Chi-square	1579.644146	122	0.0000

b. Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	31.914766	5	0.0000

APPENDIX D: THE RESULTS OF DATA PROCESSING BY EVIEWS

c. Lagrange Multiplier (LM) Test

Lagrange multiplier (LM) test for panel data
Sample: 2016 2022
Total panel observations: 833
Probability in ()

Null (no rand. effect) Alternative	Cross-section One-sided	Period One-sided	Both
Breusch-Pagan	1068.277 (0.0000)	2.691501 (0.1009)	1070.969 (0.0000)
Honda	32.68451 (0.0000)	-1.640580 (0.9496)	21.95138 (0.0000)

3. Results of Panel Regression Analysis Model 2

Dependent Variable: MV
Method: Panel EGLS (Cross-section weights)
Sample: 2016 2022
Periods included: 7
Cross-sections included: 123
Total panel (unbalanced) observations: 833
Linear estimation after one-step weighting matrix
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	189.6687	61.88320	3.064946	0.0023
VAPY	2.442312	6.718044	0.363545	0.7163
VAFI	-30.43963	10.64858	-2.858563	0.0044
VAHU	47.42843	7.737171	6.129944	0.0000
STVA	7.515388	2.459757	3.055338	0.0023
C	1441.140	12.21539	117.9774	0.0000

Effects Specification

Cross-section fixed (dummy variables)

Weighted Statistics

R-squared	0.995148	Mean dependent var	3164.260
Adjusted R-squared	0.994274	S.D. dependent var	10621.49
S.E. of regression	788.5258	Sum squared resid	4.38E+08
F-statistic	1138.538	Durbin-Watson stat	1.316291
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.866543	Mean dependent var	1519.630
Sum squared resid	5.36E+08	Durbin-Watson stat	1.107017

Table: The Using IC Measurement by Researchers

IC Measurement	Summary the Character (on the Paper)
Market to book ratio (M/ B ratio)	Chu et al. (2008)
Tobin's Q	Chu et al. (2008), Chang et al. (2008); Wang (2013); Kweh et al. (2013); and Wang (2015)
Calculated Intangible Value (CIV)	Kujansivu & Lonnqvist (2007); Chu et al. (2008); and Shiri & Mousavi (2015)
Value Added Intellectual Capital (VAIC^{TM})	Firee & Williams (2003); Chen, Cheng & Hwang (2005); Gho (2005); Kamath (2007); Kujansivu & Lonnqvist (20070, Tan, Plowman & Hancock (2007), Yalama & Coskun (2007), Chu et al. (2008); El-Bannany (2008); Ghosh & Mondal (2009), Ting & Lean (2009), Calisir, Gumussoy, Bayraktaroglu & Deniz (2010), Diez er al., (2010); Zeghal & Maaloul (2010); Chang & Hsieh (2011); Chu, Chan & Wu (2011); Clarke et al. (2011); Maditinos et al. (2011); Komnenic & Pokrajcic (2012); Mehralian et al. (2012); Mondal & Ghosh (2012); Pal & Soriya (2012); Joshi et al. (2013); Kweh et al. (2013); Wang (2013), Amin, Hasan, Nezamoddin & Tan (2014); Britto, Monetti & Rocha Lima Jr (2014); Greco, Ferramosca & Allegrini (2014); Guerrini et al. (2014); Ilyin (2014); Morariu (2014), Nassari & Nasa (2014), Stankeviciene & Cepulyte (2014); Bontis et al. (2015); El-Bannany (2015); Qusama & Fatima (2015); Shiri & Mousavi (2015); Singh & Narwal (2015); Soriya & Narwal (2015); Tripathy, Gil-Alana & Sahoo (2015); Ahmad & Ahmed (2016); Alhassan & Asare (2016); Chi et al. (2016); Dzenopoljac et al. (2016); Hejazi et al. (206); Meles at al. (2016); Saeed et al. (2016); and Sherif & Elsayed (2016)

Extended/Modified VAIC^{TM}	Chen et al (2005), Nimtrakoon (2015), Tripathy, Sahoo, Kesharwani & Mishra (2016); Tripathy et al. (2015) and Vishnu & Gupta (2015)
Efficiency in the use of total IC (EIC)	Krstic & Bonic (2016)
Return on Investment of IC (ROIC)	Chanchien & Tsai (2005)
Economic Value Added (EVA)	Chu et al (2008); and Shakina & Barajas (2014)
Adjust dynamic Residual Income Model (Adjusted RIM)	Ilyin (2014); and Sydler et al (2014)
R&D Expenditures	Vaisanen, Kujansivu & Lonnqvist (2007)
Patent Stock	Liu & Wong (2011)
Citation-weight patent stock	Liu & Wong (2011)

Source: Sardo (2018)