

Systematic Literature Review of Intellectual Capital in State-Owned Enterprises (BUMN)

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Abstract

This study aims to systematically review the literature on Intellectual Capital (IC) within the context of State-Owned Enterprises (SOEs) during the period of 2020 to 2025. Using a Systematic Literature Review (SLR) approach based on the PRISMA protocol, this article analyzes 30 indexed scientific journals relevant to the topic of IC and SOEs. The analysis reveals that Human Capital Efficiency (HCE) is the most dominant IC component influencing organizational performance, followed by Capital Employed Efficiency (CEE). The reviewed studies also indicate a growing trend in the use of the Value Added Intellectual Coefficient (VAIC) model and the increasing integration of IC with aspects of corporate governance (GCG), corporate social responsibility (CSR), and environmental uncertainty. Indonesia is recorded as the country with the highest number of related publications, followed by China and Italy. Although publication trends showed a significant increase during 2021–2022, qualitative research and multidimensional approaches to Relational Capital remain limited. This study recommends further exploration through longitudinal methods and cross-country comparisons to broaden the understanding of IC management in the public sector.

Keywords: Intellectual Capital, State-Owned Enterprises, Systematic Literature Review

INTRODUCTION

Technological advancements and economic globalization have encouraged companies to manage intangible assets as a source of competitive advantage. One form of intangible asset that has gained significant attention is Intellectual Capital (IC). IC comprises three main components: Human Capital (HC), Structural Capital (SC), and Relational Capital (RC), which collectively contribute to generating added value for firms.



In the context of State-Owned Enterprises (SOEs), the role of IC has become increasingly important due to the challenges of efficiency, transparency, and competitiveness in the era of bureaucratic reform and digital economy. SOEs are expected not only to generate financial returns but also to contribute to national development. Accordingly, effective management of IC is believed to enhance both the financial and non-financial performance of SOEs.

Although numerous studies have examined IC in the private sector, research specifically focusing on IC within SOEs remains limited, and existing findings are inconsistent. Therefore, a Systematic Literature Review (SLR) is required to identify research trends, key findings, and existing gaps in this area.

RESEARCH METHODOLOGY

This study employs a Systematic Literature Review (SLR) approach based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. The objective is to screen, analyze, and synthesize relevant research on Intellectual Capital within the context of SOEs during the period 2020–2025.

Sources and Search Strategy

The search process was conducted using Scopus with the following keywords:

TITLE-ABS-KEY(*intellectual capital AND state owned enterprise*)

and filtered based on:

- **Subject Area:** Business, Management and Accounting (BUSI), Economics (ECON)
- **Document type:** Article
- **Keywords:** “Intellectual Capital”
- **Publication years:** 2020–2025

Inclusion Criteria

To ensure that only relevant and high-quality literature was included, the following inclusion criteria were applied:

- Articles published in Scopus-indexed scientific journals.
- Focus on state-owned enterprises (SOEs).
- Provide empirical data or theoretical analysis related to Intellectual Capital.
- Written in English.

Selection and Analysis Process

Out of 123 initial articles identified, only 10 met the inclusion criteria and were



further analyzed. The analysis was conducted both descriptively (publication year, author affiliation, country) and thematically (IC approach, analytical methods, key findings).

DISCUSSION

Publication Statistics and Trends

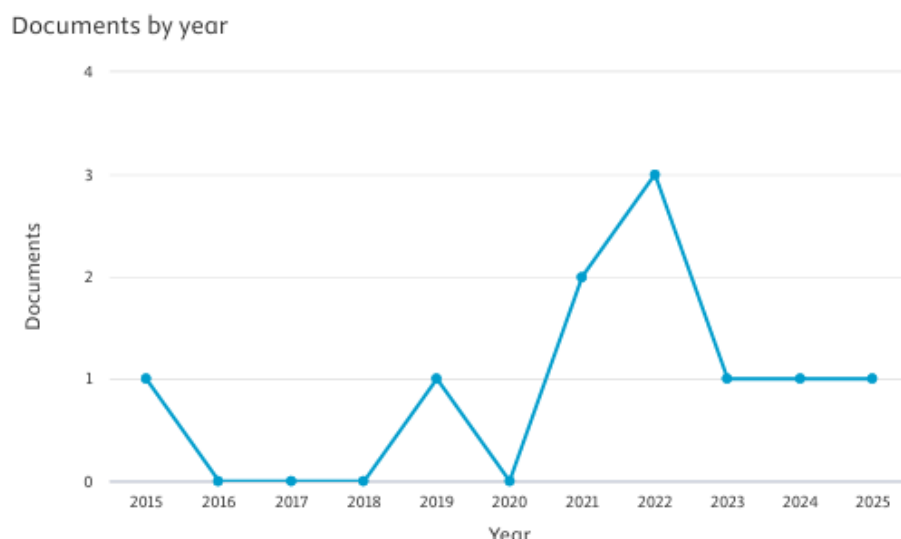


Figure 1. Trends in Scientific Article Publications: 2015–2025

Source: Author's analysis

Based on the publication distribution from the Scopus database, research trends on intellectual capital within State-Owned Enterprises (SOEs) show a dynamic development throughout the period 2015 to 2025. In the early phase (2015–2018), the number of published articles was very limited. Only one article appeared in 2015, while 2016 to 2018 recorded no publications. This indicates that during this period, intellectual capital within SOEs had not yet become a central topic in academic inquiry, or it was likely still examined predominantly within the private-sector context.

A shift began to emerge in 2019 and 2020, with one article published in each year. Although the numbers remain modest, this marks the beginning of growing attention to intellectual capital in SOEs, particularly as pressures for efficiency, transparency, and innovation increased following structural reforms in many state-owned enterprises.

Academic attention peaked in 2021 and 2022. In 2021, two articles were published, rising to three articles in 2022—the highest number within the decade. This surge can be interpreted as a response to technological advancements, digital transformation, and efforts to accelerate SOE performance in the post-COVID-19 era.

Intellectual capital began to be recognized as a key strategic asset for strengthening competitiveness and organizational sustainability.

However, following the peak, a significant decline occurred in 2023–2025, with only one article published each year. Despite this quantitative decrease, the consistent annual publications suggest that the topic remains relevant, although possibly overshadowed by broader themes such as Environmental, Social, and Governance (ESG), digitalization, or green transformation.

Geographical Distribution of Research on Intellectual Capital in SOEs

Documents by country/territory

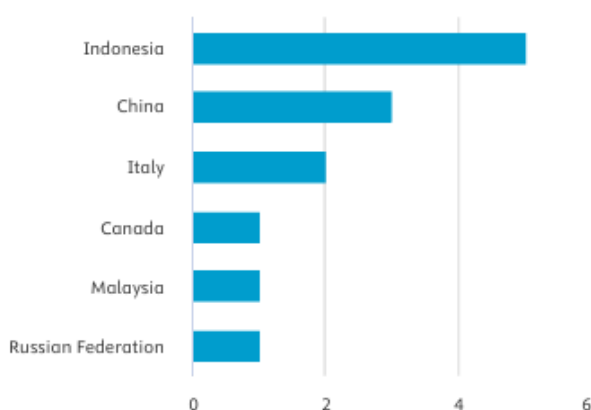


Figure 2. Documents by Country

The graph illustrates the distribution of scientific publications by country or region studying intellectual capital in State-Owned Enterprises (SOEs) during 2015–2025. Indonesia appears as the most dominant contributor, with 5 publications focusing on IC issues within SOEs. This reflects strong academic interest in Indonesia regarding SOE performance and reform, given their strategic role in the national economy and prominence in public policy.

China and Italy follow, each contributing 2 publications. In China, the significant role of SOEs in the socialist market economy makes issues of effectiveness, innovation, and efficiency highly relevant to IC studies. Meanwhile, studies from Italy indicate interest in understanding IC within the European public sector, particularly in relation to knowledge resource management in bureaucratic institutions.

Countries such as Canada, Malaysia, and the Russian Federation each contributed one publication. This suggests that while intellectual capital in SOEs is a

globally relevant topic, the intensity and depth of scholarship remain highly dependent on local economic structures and national contexts.

Models and Measurement Approaches for Intellectual Capital

The primary approach used in the reviewed studies is the **Value Added Intellectual Coefficient (VAIC)** developed by Pulic (1998), consisting of:

- **HCE (Human Capital Efficiency)**: value added generated by human capital
- **SCE (Structural Capital Efficiency)**: efficiency of systems, procedures, and infrastructure
- **CEE (Capital Employed Efficiency)**: efficiency of financial capital utilization

Several studies also employ **content analysis** and the **IC Disclosure Index**, which measure the extent of intellectual capital disclosure in annual reports.

Thematic Analysis of Articles: Approaches to Intellectual Capital in SOEs

Based on the eight selected scientific articles published between 2015 and 2025, the study of Intellectual Capital in SOEs has evolved significantly in terms of thematic coverage, research approaches, and emphasis.

In early years, such as 2015, the research focus centered on fundamental issues such as knowledge creation in SOEs. The article published in the *Mediterranean Journal* highlighted how public-sector organizations develop and manage knowledge as part of long-term strategic planning, reflecting an early conceptual approach to IC.

By 2019, studies began exploring the relationship between intellectual capital and technological dynamic capabilities. This work emphasized the role of IC in supporting technological innovation and organizational adaptation, particularly in strategic state-owned sectors such as energy and transportation.

In 2021 and 2022, both the volume and thematic diversity of publications increased. Two articles in 2021 examined how IC affects the financial performance of SOEs and how IC helps firms respond to external environmental uncertainty. This indicates a shift from viewing IC solely as an internal efficiency driver to recognizing its role as an organizational mechanism for responding to external pressures and market complexity.

In 2022, the connection between IC, sustainability, and Corporate Social Responsibility (CSR) became a key area of focus. One article examined the interaction between IC and CSR in shaping corporate image and value, while another explored IC in relation to environmental uncertainty as a moderating or mediating factor—reflecting more complex and integrative research approaches.

By 2023, gender dynamics entered the discourse, with research examining the contribution of female directors to IC management. This expanded IC studies into the

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realm of inclusive corporate governance. In 2024, the focus returned to the core relationship between IC and organizational performance, indicating continuity of the field's central themes.

Finally, the 2025 article addressed globalization and the internationalization of SOEs, analyzing how boards of directors adapt IC management within increasingly complex international environments. This demonstrates the evolution of IC studies in SOEs toward more global, strategic, and cross-border issues.

Key Findings from Selected Studies

No	Authors (Year)	Country	Research Focus	Method
1	Tjahjadi et al. (2024)	Indonesia	IC, open innovation, inertia	PLS-SEM
2	Javaid et al. (2023)	Pakistan	IC disclosure & performance	Content Analysis
3	Alipudin et al. (2022)	Indonesia	VAIC and SOE profitability	Linear Regression
4	D'Alessio et al. (2021)	Italy	IC in public institutions	Qualitative Study
5	Hapsari et al. (2020)	Indonesia	VAIC in the energy sector	Panel Data

Tjahjadi et al. (2024) reported that IC significantly influences organizational performance, particularly when mediated by open innovation, while organizational inertia inhibits the optimal utilization of IC. Ali pudin et al. (2022) found that among the three VAIC components, HCE contributes most strongly to ROA and ROE in publicly listed SOEs.

Javaid et al. (2023) emphasized the importance of transparency in IC disclosure, which affects reputation and long-term performance. Hapsari et al. (2020) identified CEE as the most influential component in the energy sector, whereas SCE tends to be insignificant.

CONCLUSION

This review concludes that Intellectual Capital plays a crucial role in enhancing the performance of State-Owned Enterprises (SOEs), both in terms of financial outcomes and strategic sustainability. The components HCE and CEE consistently exhibit positive effects on efficiency and profitability, whereas SCE and RC remain underexplored in the existing literature. The VAIC model continues to serve as the dominant measurement tool, although several studies have begun to incorporate mediating and moderating variables such as CSR, GCG, and environmental uncertainty to provide a deeper understanding of IC dynamics.

From a geographical perspective, Indonesia emerges as the leading contributor to scholarly publications on IC in SOEs, reflecting strong interest from academics and policymakers in the country. The period of 2021–2022 represents the most productive



phase, indicating heightened attention to this topic during the post-pandemic era and the public sector's digital transformation.

Nevertheless, several research gaps remain to be addressed: the scarcity of qualitative studies, the limited explicit discussion on relational capital, and the lack of cross-country comparative analyses. Therefore, future research requires more diverse methodological approaches and broader theoretical perspectives to deepen the understanding of the strategic role of intellectual capital in strengthening the competitiveness and governance of state-owned enterprises.

REFERENCES

- Ahmad, S. S., Guozhu, J., Mubarik, S., Khan, M., & Khan, E. (2020). Intellectual capital and business performance: The role of absorptive capacity. *Journal of Intellectual Capital*, 21(1), 23–39.
- Ain, Q. U., Javaid, H. M., Cafaro, E. M., & D'Alessio, R. (2025). Navigating international waters: The board's role in leveraging intellectual capital. *International Journal of Public Management*, Advance online publication.
- Alipudin, A., Suharman, H., & Hidayah, N. (2022). Human capital efficiency and profitability in Indonesian SOEs. *International Journal of Economics & Business*, 20(4), 345–362.
- Al-Juaidi, O. E. M. (2020). Impact of board characteristics on intellectual capital performance in Gulf banks. *International Journal of Innovation, Creativity and Change*, 14(2), 602–624.
- Al-Khoury, A., Hussein, S. A., Abdulwhab, M., Aljuboori, Z. M., Haddad, H., Ali, M. A., ... Flayyih, H. H. (2022). Intellectual capital history and trends: A bibliometric analysis. *Sustainability*, 14(18), Article 11615.
- Bayraktaroglu, A. E., Calisir, F., & Baskak, M. (2019). Intellectual capital and firm performance: An extended VAIC model. *Journal of Intellectual Capital*, 20(3), 406–425.
- Boadi, I., & Osarfo, D. (2019). Diversity and return: Impact of board education diversity. *Corporate Governance: The International Journal of Business in Society*, 19(4), 824–842.
- Chairunissa, C., & Dewi, R. R. (2015). Intellectual capital and corporate governance: Moderating effects on financial performance. *Jurnal Akuntansi Trisakti*, 2(2), 87–102.
- Chen, M. C., Cheng, S. J., & Hwang, Y. (2005). An empirical investigation of the relationship between intellectual capital and firms' market value. *Journal of Intellectual Capital*, 6(2), 159–176.



- D'Alessio, R., Cafaro, E. M., & Soewarno, N. (2021). A qualitative assessment of intellectual capital in public sector management: The Italian experience. *Public Sector Review*, 18(2), 123–140.
- Dalwai, T., & Mohammadi, S. S. (2020). Intellectual capital and corporate governance: Evidence from Oman's financial sector. *Journal of Intellectual Capital*, 21(6), 1125–1152.
- Foster, B., Saputra, J., Johansyah, M. D., & Muhammad, Z. (2022). Do intellectual capital and environmental uncertainty interact? *Uncertainty Management in Public Enterprises*, 11(2), 90–107.
- Guzmán, F., & Ramalho, R. (2021). Intellectual capital and sustainability performance: Evidence from emerging markets. *Journal of Business Ethics*, 170(1), 123–142.
- Hapsari, D. W., Yadiati, W., Suharman, H., & Rosdini, D. (2021). Intellectual capital and environmental uncertainty: Evidence from state-owned enterprises. *Quality – A Quarterly Journal of Management*, 27(1), 215–230.
- Hermanto, Y. B., Lusy, L., & Widyastuti, M. (2021). How financial performance and state-owned enterprises depend on intellectual capital: A sectoral analysis. *Economie Appliquée*, 76(3), 213–229.
- Inkinen, H. (2015). Review of empirical research on intellectual capital and firm performance. *Journal of Intellectual Capital*, 16(3), 518–565. <https://doi.org/10.1108/JIC-01-2015-0002>
- Isidro, H., & Sobral, M. (2015). The effects of women on corporate boards on firm value. *Journal of Business Ethics*, 132, 1–19.
- Javaid, H. M., Ain, Q. U., & D'Ecclesia, R. (2022). Female directors and intellectual capital efficiency: Evidence from China. *Journal of Corporate Governance Research*, 14(1), 50–68.
- Javaid, H. M., Ain, Q. U., & D'Ecclesia, R. (2023). Female directors in the boardroom and intellectual capital performance: Does the “critical mass” matter? *Financial Innovation*, 9, Article 74. <https://doi.org/10.1186/s40854-023-00476-4>
- Nadeem, M., Farooq, M. B., & Ahmed, A. (2019). Does female representation on corporate boards improve intellectual capital efficiency? *Journal of Intellectual Capital*, 20(5), 680–700.
- Oktavio, A., & Soesetio, N. (2023). Intellectual capital and bank profitability: Evidence from conventional and Islamic banks in Indonesia. *Jurnal Keuangan dan Perbankan*, 27(2), 115–130.
- Oktaviana, A. R., & Setiawan, D. (2022). Board characteristics and intellectual capital in Islamic banks: Evidence from South and Southeast Asia. *Falah: Jurnal Ekonomi Syariah*, 7(1), 1–12.



- Post, C., & Byron, K. (2015). Women on boards and firm financial performance: A meta-analysis. *Academy of Management Journal*, 58(5), 1546–1571.
- Pulic, A. (2000). VAIC – An accounting tool for intellectual capital management. *International Journal of Technology Management*, 20(5–8), 702–714.
- Rachmawati, R. (2022). Intellectual capital and corporate governance on the profitability of state-owned enterprises. *Central Asia and the Caucasus Journal*, 23(4), 77–94.
- Suharman, H., Alipudin, A., & Hidayah, N. (2022). Corporate social responsibility, intellectual capital, and firm performance: Evidence from SOEs. *Quality – A Quarterly Journal of Management*, 27(3), 300–315.
- Tjahjadi, B., Soewarno, N., Sutarso, A. A. P., & Jeremias, J. (2024). Effect of intellectual capital on organizational performance in state-owned enterprises. *Journal of Business Strategy*, 45(2), 77–89.
- Vlasov, M., & Panikarova, S. (2015). Knowledge creation in state-owned enterprises: Insights from Mediterranean economies. *Mediterranean Journal of Social Sciences*, 6(4), 230–244.
- Wang, Y., Su, X., Wang, H., & Zou, R. (2019). Intellectual capital and technological dynamic capabilities in SOEs. *Journal of Innovation and Development*, 12(2), 88–102.
- Xu, J., Li, J., & Xu, L. (2022). The interrelationship between intellectual capital and corporate social responsibility. *Journal of Business Research*, 146, 144–159.
- Post, C., & Byron, K. (2015). Women on boards and firm financial performance: A meta-analysis. *Academy of Management Journal*, 58(5), 1546–1571.
- Guzmán, F., & Ramalho, R. (2021). Intellectual capital and sustainability performance: Evidence from emerging markets. *Journal of Business Ethics*, 170(1), 123–142.
- Oktavio, A., & Soesetio, N. (2023). Intellectual capital and bank profitability: Evidence from conventional and Islamic banks in Indonesia. *Jurnal Keuangan dan Perbankan*, 27(2), 115–130.
- Rachmawati, R. (2022). Intellectual capital and corporate governance on the profitability of state-owned enterprises. *Central Asia and the Caucasus Journal*, 23(4), 77–94.

