

Empirical Analysis of the Impact of Intellectual Capital on Energy Sector Companies

*Intellectual Capital in
the Energy Sector*

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ABSTRACT

This study examines the phenomenon of intellectual capital in the energy sector and its impact on company value. In the context of the disruptive and VUCA (Volatility, Uncertainty, Complexity, and Ambiguity) era, where technological changes and business uncertainties are on the rise, the management of intellectual capital becomes crucial. The aim of this research is to test the influence of intellectual capital on company value in the energy sector. The study employs a quantitative approach, utilizing secondary data from the annual reports of energy sector companies listed on the Indonesia Stock Exchange during the period 2016-2021. The analytical tools used include descriptive statistics and hypothesis testing. The research findings reveal that the disclosure of intellectual capital in the energy sector is considered good, with an average of 13.872%. Statistical analysis indicates a significant influence between intellectual capital and company value, with Tobin's Q as the company value indicator. This study contributes to understanding the concept of intellectual capital in the context of the energy sector, demonstrating that a larger company value corresponds to higher disclosure of intellectual capital. This conclusion is relevant for managers, investors, and business practitioners dealing with the complexities of the market. The research also establishes a foundation for developing adaptive and responsive strategies to rapid changes in the business environment within the energy sector.

Keywords: *Intellectual capital; Company value; Energy sector*

ABSTRAK

Penelitian ini membahas fenomena modal intelektual di sektor energi dan pengaruhnya terhadap nilai perusahaan. Dalam konteks era disruptif dan VUCA (Volatility, Uncertainty, Complexity, and Ambiguity), di mana perubahan teknologi dan ketidakpastian bisnis meningkat, pengelolaan modal intelektual menjadi krusial. Penelitian ini bertujuan untuk menguji pengaruh modal intelektual terhadap nilai perusahaan di sektor energi. Penelitian menggunakan pendekatan kuantitatif dengan memanfaatkan data sekunder dari laporan tahunan perusahaan sektor energi yang terdaftar di Bursa Efek Indonesia pada periode 2016-2021. Alat analisis yang digunakan adalah statistik deskriptif dan uji hipotesis. Hasil penelitian menunjukkan bahwa pengungkapan modal intelektual di sektor energi dinilai baik, dengan rata-rata sebesar 13,872%. Analisis statistik menunjukkan bahwa terdapat pengaruh signifikan antara modal intelektual dan nilai perusahaan,

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dengan Tobin's Q sebagai indikator nilai perusahaan. Penelitian ini memberikan kontribusi pada pemahaman konsep modal intelektual dalam konteks sektor energi, menunjukkan bahwa semakin besar nilai perusahaan, semakin tinggi pengungkapan modal intelektual. Kesimpulan ini relevan bagi manajer, investor, dan praktisi bisnis dalam menghadapi dinamika pasar yang kompleks. Penelitian ini juga menciptakan landasan untuk pengembangan strategi yang adaptif dan responsif terhadap perubahan lingkungan bisnis yang cepat di sektor energi.

***Kata kunci:** Modal intelektual; Nilai perusahaan; Sektor energi*

INTRODUCTION

Intellectual Capital significantly shapes company value by serving as a source of competitive advantage, operational efficiency, and innovation. Darroch (2005) stated that effective management of knowledge, skills, and innovations positively impacts a company's financial performance and market valuation. Intellectual Capital fosters innovation, driving product and service development (Agostini et al., 2017). Moreover, it enhances operational efficiency through skilled human capital and streamlined processes (Kang & Snell, 2009). This strategic resource also influences stakeholder relationships, building trust and bolstering a positive brand image, ultimately contributing to heightened Company Value (Hoffmann & Fieseler, 2012).

The research uses Intellectual Capital to see the influence and relationship to Company Value in energy sector companies. The concept of Intellectual Capital has attracted much attention in various fields, including management, information technology and accounting. Bearing in mind that this is a disruptive era, where many changes occur due to technological advances which cause intense competition. Apart from that, we are entering the VUCA era, namely Volatility, Uncertainty, Complexity and Ambiguity which describes a business situation that leads to uncertainty and easy change which causes anxiety. Where Volatility is a condition that is uncertain and susceptible to change. Uncertainty is uncertainty and a situation full of guesswork at any time. Complexity is a situation full of complexity and ambiguity which causes confusion in reading directions. As for previous researchers who have researched Intellectual Capital, according to Santiani (2018), Rangkuti (2019) and Hafni & Priantinah (2018) explained that Intellectual Capital has a significant influence on Firm Value. However, this research is not in line with research conducted by (Lestari & Sapitri, 2016) explaining that Intellectual Capital has a significant negative influence on firm value.

Business activities in the era of disruption and VUCA have begun to shift to digital, everything aims to be automatic, easier, faster and more practical, so it is necessary to increase company value in increasing the assets of shareholders because company value is investors' perception of the level of success of a company which is related to price shares (Herry, 2017). Therefore, the opening up of opportunities for foreign investors to enter Indonesia will provide agility or pressure on the energy sector to survive in the VUCA era and the impact of the Covid-19 pandemic which has paralyzed all sectors. Company value is the agreed price of the company when it is sold to investors because it has an impact on the company's financial performance in investing (Dewi & Sudiarta, 2017). However, according to (Aprayuda & Misra, 2020). Company value is defined as market value because company value can provide maximum shareholder prosperity if the company's share price increases.

The intellectual capital (IC) phenomenon in Indonesia began to develop when regulations regarding intangible assets were contained in (PSAK No. 19, 2009). According to PSAK No. 19, (2009), intangible assets are non-monetary assets that can be identified and do not have physical form and are held for use in producing or delivering goods or services, renting them to other parties, or for administrative purposes. Intellectual capital has a very important role, this is because it refers to intangible resources that create company value (Ashton & Lee, 2005), by giving the company a competitive advantage (Edvinsson & Malone, 1997; Stewart, 1997). Intellectual capital is knowledge and information that is applied to a job in creating organizational or company value (Williams, 2001). This study explores intellectual capital's impact on company value in the energy sector, employing a quantitative approach with Indonesian Stock Exchange data (2016-2021)

LITERATURE REVIEW AND HYPOTHESES

Resource Based Theory (RBT) is a theory that explains that every organization or company is able to manage the various resources it has and provide a competitive advantage for the organization. This RBT focuses on the concept of difficult-to-imitate attributes that give the company competitive advantages (Barney, 1986). However,

according to (Ramadan et al., 2017) Resource Based Theory (RBT) is a theory developed to describe an advantage for companies.

The importance of Intellectual Capital needs to be realized by companies to be able to increase their advantages and so that companies become more competitive. IC is also useful as a knowledge-based company asset that can be beneficial for the company (Lestari & Sapitri, 2016). Intellectual Capital has attracted the attention of many academics and the business community, because it is seen as having a very important role in creating and maintaining competitive advantage and value for companies (Obeidat et al., 2021). Even though intellectual capital is important for achieving competitive advantage, many companies do not yet understand the concept and value of intellectual capital, especially how to manage intellectual capital so that it can increase competitive advantage so that it can improve company performance (Nurhayati et al., 2019). Intellectual capital is a concern in the fields of information technology management, sociology and accounting (Petty & Guthrie, 2000; Wulandari et al., 2018).

Company value is the value of a company that is currently operating and the conditions that have been achieved by the company are a manifestation of public trust because the company has gone through a process of activities for several years, namely since the company was founded until now (Siregar & Safitri, 2019). High company value will increase market confidence in the company's future prospects and also the level of company performance (Reschiwati et al., 2020). Shareholder prosperity can be maximized with a high level of company value through increasing share prices (Anggraini & Tanjung, 2020) Scholars drawing from the Resource-Based View (RBV) argue that Intellectual Capital, encompassing human, structural, and relational elements, constitutes a source of sustained competitive advantage. Empirical studies by Bontis et al. (2018) and Edvinsson and Malone (1997) have demonstrated a positive correlation between firms with rich Intellectual Capital and superior financial performance, suggesting that the unique and non-replicable nature of knowledge assets contributes significantly to increased firm value. Moreover, the Knowledge-Based View (KBV) emphasizes the strategic importance of intellectual resources, positing that a firm's capacity to create, acquire, and apply knowledge is central to its ability to innovate and adapt. Subramanian and Nilakanta (1996) and Huang & Huang (2020) have delved into the impact of specific components of Intellectual Capital, such as human capital and innovation capabilities, on firm value. Findings consistently support the notion that investments in Intellectual Capital positively influence a firm's ability to generate value over the long term. In addition, agency theory and stakeholder theory contribute to the literature by highlighting the mechanisms through which Intellectual Capital influences firm value. Appuhami & Bhuyan (2015) argue that a knowledgeable and motivated workforce, a key component of Intellectual Capital, aligns the interests of managers and shareholders, thereby reducing agency costs and positively impacting firm value. Furthermore, Hormiga et al. (2011) and Li et al. (2008) emphasize the role of relational capital in building positive relationships with stakeholders, influencing perceptions of the firm's value in the broader marketplace. Based on the description, the following hypothesis is proposed:

H1 - Intellectual Capital has a significant effect on Firm Value.

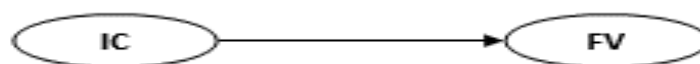


Figure 1. Conceptual framework

RESEARCH METHODS

The research paradigm is quantitative, employing a quantitative causal approach chosen to align with the objective of developing an empirical model for enhancing

company value based on performance assessed through the lens of intellectual capital. The variables encompass three types: 1) the dependent variable, being company value; 2) the independent variable, representing the company's intellectual capital; and 3) the mediating variable, reflecting company performance.

Company value is gauged through Tobin's Q, while organizational intellectual capital is measured by the Value-Added Intellectual Capital (VAIC) ratio, drawing from research by Smriti and Das (2018). Secondary data, sourced from the Indonesian Stock Exchange (IDX), published annual reports, and other relevant, verifiable sources, constitute the dataset. The study's population comprises all companies within the energy sector listed on the Indonesian Stock Exchange, with purposive sampling applied to meet specific criteria. The research sampling criteria are as follows:

1. Energy sector companies that consistently or successively sell part of their ownership rights in the capital market through the official organizer, namely Indonesian Stock Exchange for the 2016-2021 period.
2. Energy sector companies that have consistent financial information from 2016 to 2021, this information is needed to calculate company value, company intellectual capital and company performance.

The analytical tool used in this research is descriptive statistics. Descriptive statistics are used to present information in the form of a description of the object that is the focus of the research.

RESULTS AND DISCUSSION

Based on the results of descriptive statistical data processing, the following IBM SPSS 26 output results were obtained:

Table 1. Descriptive Statistics

	N	Min	Max	Mean	Std.Dev
Tobins'Q	234	,18266	5,7999	1,2356	,8063
VAIC	234	11,188	775,30	13,872	65,187
Valid N (listwise)	234				

Based on Table 1 which shows the results of descriptive statistics, it can be seen that the average Tobins'q value of energy sector companies listed on the Indonesia Stock Exchange during 2016-2021 is 1.23%. The highest Tobins'Q in the research sample was 5.79% and the lowest Tobins'Q percentage was -0.182%. The standard deviation value of the capital structure variable in this study is 0.80637.

Based on Table 1 which shows the results of descriptive statistics, it can be seen that the average VAIC value of energy sector companies listed on the Indonesia Stock Exchange during 2016-2021 was 13.87%. The highest VAIC in the research sample was 775.3% and the lowest VAIC percentage was -11.188%. The standard deviation value of the capital structure variable in this research is 65.187.

The results showed that the descriptive statistics presented in Table 1 offer a comprehensive snapshot of the performance and characteristics of energy sector companies listed on the Indonesia Stock Exchange from 2016 to 2021. The average Tobins'q value, a metric assessing firm value, stands at 1.23%, indicating a modest overall valuation. The range of Tobins'q values from -0.182% to 5.79% suggests considerable variability in firm valuations within the sample. The standard deviation of the capital structure variable at 0.80637 illustrates the degree of dispersion around the mean, reflecting diversity in capital structures among the studied companies. The company's main goal is to increase significant company value by increasing the prosperity of the company owner or shareholders (Brigham & Houston, 2001). Increasing company value is the same as increasing company value (Chasanah, 2018). The relationship between intellectual capital and company value has been proven in research (Firer & Williams, 2003) and (Hermanto et al., 2021) which states that intellectual capital has a positive

influence on financial performance. The findings showed that company knowledge of assets is an essential component of business and a sustainable resource to be able to obtain and maintain a competitive advantage.

Turning to intellectual capital, the average value-added Intellectual Coefficient (VAIC) of 13.87% signifies its contribution to company value. The wide range of VAIC values, spanning from -11.188% to an impressive 775.3%, underlines substantial diversity in how intellectual capital is leveraged within the sample. The standard deviation for the capital structure variable in this context, at 65.187, denotes the considerable variability in capital structures among energy sector firms. These statistics not only provide a quantitative foundation for understanding the financial landscape of the energy sector during the specified period but also set the stage for further analysis into the relationship between intellectual capital, firm value, and capital structure within this dynamic and diverse industry. Companies typically aim to enhance the prosperity of owners or shareholders by increasing company value in the short or long term (Midiantari & Agustia, 2020). As business competition intensifies, it significantly influences the management and formulation of business strategy. Therefore, managing intellectual capital, with a crucial role in production activity objectives, becomes imperative. In the competitive landscape, the focus of production activities has shifted from solely creating finished goods to emphasizing the integration of scientific knowledge into the creation of goods and services (Pulic, 2000; Petrenko et al., 2019). This transformation signifies a shift from a workforce-based business strategy to a knowledge-based approach, capable of generating value through innovative processes (Sawarjuwono & Kadir, 2003; Mingaleva et al., 2019). The evolving nature of production activities reflects the adaptation of businesses to the dynamic challenges of the contemporary market, emphasizing the significance of intellectual capital in fostering competitiveness and creating value.

CONCLUSION

The results indicate that intellectual capital disclosure in the energy sector listed on the IDX for the 2016-2021 period is rated as good, with an average disclosure value of 13.872%. This positive assessment suggests that energy sector companies recognize the significance of disclosing intellectual capital for creating and sustaining competitive advantages. Notably, the variable influencing intellectual capital disclosure is company value, implying that higher company value corresponds to increased intellectual capital disclosure. Conversely, intellectual capital significantly impacts company value. This study contributes to understanding intellectual capital in the energy sector, providing a foundation for companies to develop adaptive strategies amid rapid business changes. The conclusion is pertinent for managers, investors, and practitioners aiming to enhance their companies' value in the face of complex market dynamics.

For future research, it is recommended to explore additional aspects that can deepen the understanding of the relationship between intellectual capital and firm value in the energy sector. Research may involve mediating or moderating variables that may moderate the relationship. Additionally, research can consider different geographic or regulatory contexts to understand their impact on intellectual capital management and firm value. A cross-sector approach or comparison between countries could also provide further insight into how intellectual capital management practices may vary and impact the value of firms in the energy sector.

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