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**CORPORATE SOCIAL RESPONSIBILITY, INTELLECTUAL CAPITAL, AND FIRM
 VALUE: A CASE STUDY OF ENERGY COMPANIES IN INDONESIA**

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Abstract. This study aims to analyse the relationship between the independent variable *Corporate Social Responsibility* (CSR), the mediating variable *Intellectual Capital* measured through the *Variable Added Intellectual Coefficient* (VAIC), which includes *Human Capital Efficiency* (HCE), *Structural Capital Efficiency* (SCE), and *Capital Employed Efficiency* (CCE), and the dependent variable *firm value* represented by *Tobin's Q*. Additionally, control variables such as *firm size*, *leverage*, and *sustainability reporting* are included in the analysis. Data for this study were obtained from companies listed in the *IDX Energy sector index* during the period 2018-2022. Based on the research findings, a significant relationship was found between *Corporate Social Responsibility* (CSR) and *Tobin's Q*, indicating that CSR practices contribute to firm value as measured by *Tobin's Q*. The mediating variable, *Intellectual Capital*, also has a significant impact on *Tobin's Q*. The results of the mediation model analysis indicate that *intellectual capital* plays a role as an intermediary in the relationship between CSR and *Tobin's Q*.

Abstrak. Penelitian ini bertujuan untuk menganalisis hubungan antara variabel independen *Corporate Social Responsibility* (CSR), variabel mediasi *Intellectual Capital* yang diukur melalui *Variable Added Intellectual Coefficient* (VAIC), yang meliputi *Human Capital Efficiency* (HCE), *Structural Capital Efficiency* (SCE), dan *Capital Employed Efficiency* (CCE), dan variabel dependen nilai perusahaan yang diwakili oleh *Tobin's Q*. Selain itu, variabel kontrol seperti *firm size*, *leverage*, dan pelaporan keberlanjutan juga disertakan dalam analisis. Data untuk penelitian ini diperoleh dari perusahaan yang terdaftar di indeks sektor Energi BEI selama periode 2018-2022. Berdasarkan temuan penelitian, ditemukan hubungan yang signifikan antara *Corporate Social Responsibility* (CSR) dan *Tobin's Q*, yang mengindikasikan bahwa praktik CSR berkontribusi terhadap nilai perusahaan yang diukur dengan *Tobin's Q*. Variabel mediasi, *Intellectual Capital*, juga memiliki pengaruh yang signifikan terhadap *Tobin's Q*. Hasil analisis model mediasi menunjukkan bahwa *Intellectual Capital* berperan sebagai perantara dalam hubungan antara CSR dan *Tobin's Q*.

INTRODUCTION

The energy industry plays an important role in our society, impacting not only the social and environmental aspects, but also the economic landscape. As highlighted by Leisen et al. (2019), this industry serves as the backbone that fulfills the essential needs of individuals and facilitates the production of goods and services, ultimately driving the economic prosperity of society. According to Meng et al. (2021), the absence of energy supply can leave countries grappling with severe social and economic challenges. It is in this context that the sustainability of energy supply becomes crucial, as underlined by Wei et al. (2021). The sustainability of the energy industry not only ensures economic stability and growth, but also serves as a linchpin in mitigating a broader spectrum of economic, social and environmental issues. The interconnectedness between the energy sector and these challenges underscores the importance of Corporate Social Responsibility (CSR) in the energy industry, where companies must balance economic interests with their responsibilities to society and the environment.

Corporate Social Responsibility is when companies engage in activities that appear to promote social goals beyond those required by law (Siegel and Vitaliano, 2007). Harjoto and Jo (2011) summarize existing theories on why firms engage in CSR and argue that one way firms use CSR is to send product quality signals. Such signals overcome adverse selection arising from information asymmetry about product quality (Kirmani and Rao, 2000). As a result, although CSR has costs, it has strategic significance and is a source of competitive advantage for firms in various industries (Baron, 2001; Porter and Kramer, 2006).

There are two views on the role of CSR and its involvement with companies. In the strategic view of CSR, companies engage in CSR activities with the aim of gaining economic benefits. Therefore, firms in competitive industries have an incentive to be more active in CSR activities to gain a competitive advantage. Fernández-Kranz and Santaló (2010) found strong evidence suggesting that firms operating in more competitive industries are more likely to engage in social responsibility. Hawn et al. (2013) also found evidence supporting the claim that firms in competitive industries are more active in social responsibility. An alternative view is that firms operating in non-competitive industries will benefit more from socially responsible activities than firms in competitive industries. According to Baron (2001), companies are subject to both private and public political pressure from activists and government regulators. Corporate involvement in CSR activities is considered a strategy to prevent political actions that may result in direct and indirect costs to the firm.

Resource Based Theory (RBT) states that the nature of a firm's resources, competencies, and accumulated knowledge are the main drivers of variations in business performance (Luca et al., 2014). Based on RBT (Freeman, 2011), CSR activities can increase a firm's intangible assets, improve relationships with stakeholders, and lead to the development of a firm's competitive advantage, ultimately improving firm performance. Hoog (2008) defines intangible assets as property that has no physical substance and its useful life is subjective, depending on ownership rights and competitive advantages and related advantages, which can be obtained or developed internally. By paying attention to its intangible assets, a company can maximize the potential of its internal resources, adapt to market changes, and overall achieve long-term growth and success.

Intellectual Capital (IC) is an intangible asset of a company, which can be in the form of knowledge, information, and experience owned by the company's human resources and organization (Stewart, 2010). The IC of a company is a collection and synergy of knowledge, experience, inventions, innovations, market share, and communities that can affect the company

(Akpinar, 2014). According to (Pulic, 2000), the IC of a company can be known by calculating the Value Added Intellectual Coefficient or VAIC. VAIC is used to help companies evaluate and measure the efficiency and effectiveness of the company's intellectual capital management. The VAIC model developed by Pulic (2000) is used to measure a company's IC by evaluating the efficiency of three main components: Human Capital Efficiency (HCE), which measures the costs generated by the company's employees, Capital Employed Efficiency (CEE), which includes financial capital or accounting assets and liabilities. And Structural Capital Efficiency (SCE), which is defined as the difference between value added and human capital. Using VAIC, companies can assess the extent to which intangible assets, such as knowledge, employee skills, and relationships with customers and business partners, contribute to creating added value and improving company performance.

Research by Nirino et al. (2022) showed that CSR has a positive relationship with various components of IC, including human capital and structural capital. Companies can attract talented employees and reduce labor-related costs by demonstrating commitment to social and environmental issues (Albinger and Freeman, 2000). In addition, creating an environment that encourages the development of new ideas related to sustainability can improve morale and working conditions (Vazquez-Carrasco and Lopez-Perez, 2013). CSR practices also strengthen the relationship between companies and their employees, increasing loyalty and motivation in the workforce (Aras et al., 2011). As a result, the efficiency of human capital utilization increases. Jardon and Dasilva (2017) also emphasized that companies need an organizational structure and corporate culture that support the implementation of CSR strategies. CSR has a positive impact on structural capital through management processes and corporate culture (Aras et al., 2011).

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

In the knowledge economy, information and knowledge allow companies to grow, improving business processes which ultimately improves the financial performance of the company (Nirino et al., 2022). In the contemporary landscape, IC emerges as a pivotal element contributing to competitive advantage across diverse organizational realms (Jordão and de Almeida, 2017). This significance prompts recent research endeavors delving into the intricate connection between CSR activities, along with an examination of their combined influence on overall firm performance (Beretta et al., 2019; Massaro et al., 2018).

Chen and Chang (2012) highlighted the link between IC and environmental and social aspects of the firm. The development of strategies related to environmental and social issues can increase the amount of corporate intangibles by creating a competitive advantage for the company (Nikolaou, 2019). The role of intangibles in the specific relationship between CSR and firm performance is still in an embryonic stage of study, due to difficulties in measuring and evaluating these key resources within firms (Grewatsch and Kleindienst, 2017). As a result, the impact of CSR and IC on firm value or their interconnection remains unclear in the literature (Kim et al., 2018). Margolis and Walsh (2003) also clearly emphasize the relevance of developing models that incorporate more novel variables to analyze the causal relationship between CSR and firm financial performance. Therefore, based on these considerations, this research aim to fill this gap by proposing IC as a mediator in the relationship between CSR and firm value.

Story and Neves (2015) highlight that CSR strategies can have both positive and negative impacts on firm performance. These outcomes depend on a firm's ability to increase its investment in sustainability-related actions and effectively communicate CSR strategies to stakeholders. By adopting a legitimacy perspective, firms often invest in genuine CSR initiatives to build a

competitive advantage that can improve long-term financial performance (McWilliams and Siegel, 2011). However, the development of corporate culture and managerial practices associated with CSR, such as the creation of sustainable products and processes with lower environmental impact, may initially incur higher costs, leading to performance setbacks in the short term (Darnall and Edwards, 2006).

Hypothesis 1 (H₁): CSR affects firm value.

Human Capital Efficiency is a key element in IC that plays a central role in creating intangible value, especially in the knowledge-driven era (Guest, 2017). In the management field, human resources are treated like any other commodity, assuming that their replacement can be done easily if their performance does not meet expectations (Fernando et al., 2019). HCE reflects the value derived from investments in labor. This ratio details the contribution of every dollar invested in human capital to the overall value added generated by the business (Sudiyatmoko, 2018). Furthermore, structural capital, as asserted by (Xu and Wang, 2018), includes all non-human information assets stored in the organization. This includes databases, procedure manuals, organizational diagrams, operational routines, methods, and everything that contributes to the value of the company beyond the value of its physical assets. Structural capital has its roots in the structure and operational principles of the company, which shows a forward-looking orientation in long-term value creation (Bellucci et al., 2021). Studies conducted by (Silvia and Maftukhah, 2018) confirm that Structural Capital Efficiency (SCE) has a positive and significant effect on financial performance and firm value. Capital Employed Efficiency (CEE) in the context of IC has been emphasized by Habibah and Riharjo (2016) highlighting the positive and significant relationship between CEE in the IC framework and overall organizational financial performance. This finding confirms the importance of managing capital resources efficiently to stimulate organizational success and improve financial results.

Hypothesis 2 (H₂): Intellectual Capital affects firm value.

Numerous studies have underscored the importance of CSR investments and their potential benefits to firms (Surroca et al., 2010). Guided by the Resource Based View (RBV) perspective, it is widely recognized that superior firm performance often depends on the development of resources, which in the long run will result in competitive advantage (Meso and Smith, 2000). These resources represent a variety of unique assets that cannot be easily replaced without compromising the firm's competitive advantage (Barney, 2001). Within the realm of inimitable resources, IC and its constituent elements, including human capital and structural capital, play a critical role in driving competitive advantage and improving a firm's financial performance (Mondal and Ghosh, 2012). In addition, the evolving landscape of social and environmental concerns has emerged as a potential source of competitive advantage (Nikolaou, 2019). Indeed, Hart (1995) extended the boundaries of the RBV by introducing the Natural Resource Based View (NRBV) framework, which emphasizes that knowledge relating to environmental and social dimensions can contribute significantly to the development of intangible assets within the firm. These intangible assets, in turn, have the potential to generate better financial performance.

Hypothesis 3 (H₃): Intellectual Capital mediates the effect of CSR on firm value.

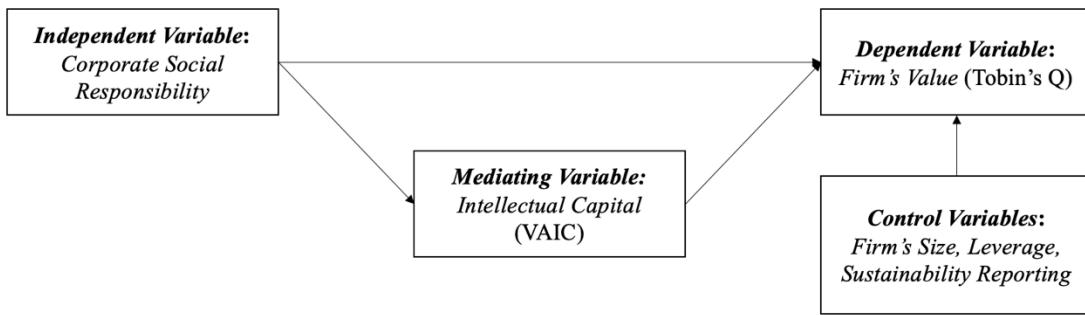


Figure 1. Research Model

RESEARCH METHODS

Data

Sample is a unit that is taken into account as a research subject. In this case, the unit of analysis that will be analyzed by researchers is the companies listed on the IDX Sector Energy index for the period 2018-2022. The data used in this study are secondary data. The secondary data in question is in the form of previous research results taken from journals, e-books, scientific articles, and others. In addition, data on CSR, IC and firm value are taken from the company's financial statements, Refinitiv, and other sources.

Methodology

This study evaluates firm value as the dependent variable through the use of Tobin's Q, which is the ratio between the firm's market value and its intrinsic value. In other words, the ratio divides the company's market value by the replacement cost of its assets. The use of Tobin's Q is used to assess whether the value of a company is considered high or low.

$$Tobin's Q = \frac{Equity Market Value + Book Value of Liabilities}{Book Value of Total Assets} \quad (1)$$

This study measures corporate CSR as an independent variable represented by the ratio between total CSR costs incurred by the company and total profit before tax earned by the company. The ratio is used to reflect a company's commitment to the philanthropic aspect of CSR. The ratio gives an idea of the extent to which companies donate back to society or charitable entities as part of their CSR practices.

$$CSR = \frac{Total Charitable Contributions (CSR Expense)}{Total Profit before Tax} \quad (2)$$

This study utilizes Value Added Intellectual Coefficient (VAIC) as a mediating variable used in evaluating IC performance. VAIC calculation involves three main components, namely Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE), and Capital Employed Efficiency (CEE), which are summed up as a whole to get an overall VAIC value (Pulic, 2000).

$$VAIC = HCE + SCE + CEE \quad (3)$$

This study also uses control variables, namely firm size, leverage, and sustainability reporting. Firm size is the size or scale of a company that reflects how big the company is based on total revenue, total assets, total employees, or market capitalization. Leverage reflects the company's level of dependence on funding sources in the form of debt. Sustainability reporting is used to measure whether the company discloses sustainability reports in a certain period or not. The Sustainability Reporting variable is represented by a dummy variable, which takes the value of 1 for companies that publish sustainability reports in the relevant period and 0 for companies that do not publish sustainability reports.

Multiple linear regression tests are used to predict changes in the dependent variable in response to an increase or decrease in the independent variable, as well as to determine whether the relationship between the two is positive or negative. This test is conducted to determine whether the Intellectual Capital variable mediates the relationship between Corporate Social Responsibility and firm value.

Regression model 1 analyzes the effect of Corporate Social Responsibility on firm value (Tobin's Q). So that the regression model is obtained as follows:

$$FV_{,t} = \alpha + \beta_1 CSR_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 SUST_{i,t} + e \quad (4)$$

Regression model 2 analyzes the effect of Intellectual Capital (VAIC) on firm value (Tobin's Q). So that the regression model is obtained as follows:

$$FV_{,t} = \alpha + \beta_1 VAIC_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 SUST_{i,t} + e \quad (5)$$

Regression model 3 analyzes the effect of Intellectual Capital (VAIC) on the relationship between Corporate Social Responsibility and firm value (Tobin's Q). So that the regression model is obtained as follows:

$$FV_{,t} = \alpha + \beta_1 CSR_{i,t} + \beta_2 VAIC_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 LEV_{i,t} + \beta_5 SUST_{i,t} + e \quad (6)$$

RESULTS AND DISCUSSIONS

Samples

Based on the predetermined sample member selection criteria, 30 companies were obtained that met the criteria for selecting sample members with details of 27 companies reporting the components or variables used in the study for 5 consecutive years and 3 other companies only reporting on certain periods. This research was conducted in the period 2018 to 2022 so that 146 firm year observations were collected.

Descriptive Statistics

Table 1. Descriptive Statistics

Variable	Mean	Std. Dev.	Minimum	Maximum
Tobin's Q	1,3691	1,7763	0,4064	18,0851
CSR	0,01	0,0678	-0,4245	0,4931
VAIC	11,4915	14,8635	-5,9271	85,2467
Firm Size (SIZE)	29,9744	1,4249	26,621	32,754
Leverage (LEV)	0,7422	2,9343	-9,038	29,687
Sustainability Reporting (SUST)	0,5822	0,4949	0	1

In this data analysis, there are several variables that are the focus of research, with Tobin's Q as the dependent variable, CSR as the independent variable, and VAIC as the mediating variable. The data in the descriptive statistics on the Tobin's Q variable has been normalized.

Analysis and Discussions

Table 2. The Effect of CSR on Firm Value

Variable	Coefficient	Std. Eror	t-Stat	Prob > F
CSR	0,9060	0,4490	2,02	0,044**
SIZE	-0,0677	0,0413	-1,64	0,101
LEV	-0,0108	0,0085	-1,26	0,206
SUST	0,0307	0,0889	0,35	0,730
cons	3,1679	1,2502	2,53	0,011**
R-Squared	0,0137			
Prob (F- Statistic)	0,0202			

From the results of the regression analysis above, it is found that the constant value obtained is 3.1679. This means that if all independent variables, including CSR, and control variables such as firm size, leverage, and sustainability reporting have a value of zero, then the firm value in the Q ratio will be 3.1679.

The results of data analysis regarding the effect of CSR, which is measured through the ratio of the company's CSR costs to the company's net income, on firm value, which is approximated by Tobin's Q, show that there is a significant effect of CSR on firm value. This finding is supported by the significance level of CSR of 0.044 on firm value. Furthermore, the positive value of the regression coefficient of the CSR variable indicates that the effect arising from CSR is positive. In other words, the higher the CSR value owned by a company, the greater the firm value it can generate. Thus, the conclusion that can be drawn is to support Hypothesis 1 (H_1) which states that there is a positive influence between CSR and firm value.

This finding reinforces the idea that CSR-related decisions have a direct positive impact on firm value. In the Resource Based View (RBV) perspective, CSR decisions are considered to enhance a firm's understanding of environmental and sustainability issues, thereby contributing directly to an increase in firm value (Barney, 1991). The relevance of this finding becomes clearer in the current market conditions, where environmental and social concerns are key factors in corporate strategic decision-making, along with corporate sustainability goals. Although the implementation of CSR incurs costs, it is considered to have strategic significance and is a source of competitive advantage for companies in various industrial sectors (Baron, 2001; Porter and Kramer, 2006). Thus, investment in sustainability can be seen as a strategic move that supports the long-term growth and positive reputation of the company.

The results of this analysis support the findings of previous studies that noted a positive relationship between CSR and firm value. As an illustration, a recent study by Cho et al. (2019) found a positive correlation between CSR and Tobin's Q, which is used as an indicator to measure firm value. Another finding in line with the results of this analysis comes from a study by Taylor et al. (2018), which confirms that strategic engagement in social responsibility, not just as a cosmetic display, can increase firm value through sustainable CSR practices.

Table 3. The Effect of VAIC on Firm Value

Variable	Coefficient	Std. Eror	t-Stat	Prob > F
VAIC	0,0103	0,0028	3,72	0,000***
SIZE	-0,1091	0,0388	-2,81	0,005***
LEV	-0,0075	0,0081	-0,92	0,356
SUST	-0,0125	0,0889	-0,14	0,889
_cons	4,3208	1,1702	3,97	0,000***
<i>R-Squared</i>	0,053			
Prob (F- Statistic)	0,0000			

From the results of the regression equation above, the constant value obtained is 4.3208. This means that if the value of the independent variable CSR and control variables such as firm size, leverage, and sustainability reporting is zero, then the firm value in the Q ratio will reach 4.3208.

The results of data analysis related to the impact of Intellectual Capital, which is measured using the Value Added Intellectual Coefficient, on firm value estimated through Tobin's Q show that there is a significant effect of IC on firm value. This finding is reinforced by the significance

level of IC of 0.000 on firm value. In addition, the positive value on the regression coefficient of the IC variable indicates that the impact generated by IC is positive. In other words, the higher the IC value owned by a company, the greater the company value it can achieve. Therefore, the conclusion that can be drawn is to support Hypothesis 2 (H₂) which states that there is a positive influence between IC and firm value.

These findings are in accordance with the Resource Based Theory proposed by Helfat and Peteraf (2003), where this theory asserts that the creation of a sustainable competitive advantage in a company is related to the uniqueness and heterogeneity of its resource pool. This implies that exclusive and context-specific resources can be the key to dominance in the execution of certain activities, which in turn, creates a competitive advantage. One form of intangible resource, Intellectual Capital, is an integral element in the formation of a company's competitive advantage. IC, encompassing the knowledge, information, and experience of the firm's human and organizational resources (Stewart, 2010), can be seen as a resource that enriches the firm's resource pool. Thus, in the context of Resource Based Theory, it can be understood that optimizing the use of Intellectual Capital can be a determining factor in increasing the value of the company.

The findings of this analysis are consistent with previous studies that have consistently noted a positive correlation between Intellectual Capital and firm value. For example, in the study of Nguyen and Doan (2020), the results of the analysis show a positive and significant impact of IC on firm value, amplifying the understanding that these intangible assets play a central role in increasing firm value. Similar results are also found in a study conducted by Rehman et al. (2022), especially in the context of Islamic banking, where there is a positive and significant effect of IC on firm value, with Tobin's Q as the dependent variable and VAIC as the independent variable.

Table 4. The Effect of CSR and VAIC on Firm Value

Variable	Coefficient	Std. Eror	t-Stat	Prob > F
CSR	0,8092	0,4709	1,72	0,086*
VAIC	0,01	0,0027	3,66	0,000***
SIZE	0,01	0,0390	-2,71	0,007***
LEV	-0,0087	0,0095	-0,91	0,361
SUST	0,0093	0,0839	0,11	0,912
_cons	4,2086	1,2577	3,59	0,000***
<i>R-Squared</i>	0,0729			
Prob (F- Statistic)	0,0000			

From the results of the regression equation above, a constant value of 4.2086 is obtained. The interpretation of this value is that if all independent variables, namely CSR, VAIC as a mediating variable, and control variables such as firm size, leverage, and sustainability reporting have a value of zero, then the company value in the Q ratio will reach 4.2086.

The results of data analysis related to the impact of Corporate Social Responsibility and Intellectual Capital on firm value, measured through the ratio of CSR costs to company net income and VAIC, and estimated by Tobin's Q, show a significant influence of these two variables on firm value. This finding is supported by the significance level of 0.086 for CSR and 0.000 for IC on firm value. Based on the previous hypothesis that there is a positive and significant relationship between CSR and IC, it can be concluded that CSR affects the company's IC, which in turn has an impact on increasing the company's value. This means that the higher the CSR value of a company, the greater the company's IC value, which is then followed by an increase in company value.

Therefore, the conclusion that can be drawn is to support Hypothesis 3 (H_3), which states that Intellectual Capital mediates the relationship between CSR and firm value.

The results of the analysis indicate the existence of a partial mediation effect of IC on the relationship between CSR and firm value. Partial mediation indicates that the mediator (IC) affects the dependent variable; however, it also indicates the existence of a partially direct relationship between CSR and firm value, as described by Baron and Kenny (1986). This result implies that CSR-related decisions have a direct influence on firm financial performance, in line with previous research findings (Bird et al., 2007; Margolis et al., 2003).

The results of this analysis are in line with previous findings that consistently show that Intellectual Capital mediates the relationship between Corporate Social Responsibility and firm value. For example, research conducted by Jain et al. (2017) emphasized that IC has a significant impact in mediating the relationship between CSR and financial performance in small and medium scale companies (SMEs). Meanwhile, Nirino et al. (2020) found a mediating effect of IC on the relationship between CSR and firm value. This suggests that the implementation of CSR strategies can have a positive impact on the development of corporate IC, which in turn, as a whole, can increase firm value. The consistency of these findings confirms that the mediating role of IC on the relationship between CSR and firm value is not an isolated phenomenon, but rather a common pattern observed in a number of previous studies. Therefore, developing and properly utilizing IC can be an effective strategy in increasing firm value, especially in the context of CSR implementation.

CONCLUSIONS

This study aims to evaluate the impact of Corporate Social Responsibility (CSR) and Intellectual Capital on firm value, while paying attention to the role of IC as a mediator in the relationship between CSR and firm value. The data used comes from the financial statements and sustainability reports of companies as samples. The sample consists of companies listed on the IDX Sector Energy index, specifically during the period 2018-2022. The independent variable in this study is CSR, measured through the ratio of CSR costs to company net income. The mediating variable is IC, calculated using the Value Added Intellectual Coefficient (VAIC) method. Firm value, proxied by Tobin's Q is the dependent variable in this study. Data analysis was carried out using the Stata program. From the results of the hypothesis testing that has been carried out, it can be concluded as follows:

1. Corporate Social Responsibility has a positive and significant effect on firm value.
2. Intellectual Capital has a positive and significant effect on firm value.
3. Intellectual Capital mediates the relationship between Corporate Social Responsibility and firm value.

Based on the results of proving the hypothesis above, it can be concluded that there is a partial mediation relationship by IC on the relationship between CSR and firm value. This finding suggests that CSR can affect firm value either directly or indirectly through the role of IC. Therefore, a firm's commitment to CSR programs has the potential to increase IC as a firm's intangible asset, which in turn can contribute to an increase in firm value.

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