ELIT
Economic Laboratory Transition
Research Podgorica

Montenegrin Journal of Economics

For citation:

Hoang, H.T-T., Vo, D.H., Tran, N.P. (2025), "The Threshold Effect of Intellectual Capital on the Corporate Social Responsibility - Firm Performance Nexus in Vietnam", *Montenegrin Journal of Economics*, Vol. 21, No. 4, pp. 35-45.

The Threshold Effect of Intellectual Capital on the Corporate Social Responsibility - Firm Performance Nexus in Vietnam

HIEN THI-THU HOANG[1], DUC HONG VO[2], and NGOC PHU TRAN[3] (*Corresponding author*)

[1] The CBER – Research Centre in Business, Economics & Resources Ho Chi Minh City Open University Vietnam, Ho Chi Minh City, Vietnam
[2] Professor, The CBER – Research Centre in Business, Economics & Resources Ho Chi Minh City Open University Vietnam, Ho Chi Minh City, Vietnam
[3] PhD student, The CBER – Research Centre in Business, Economics & Resources Ho Chi Minh City Open University Vietnam, Ho Chi Minh City, Vietnam

ARTICLE INFO

Received March 16, 2024
Revised from April 16, 2024
Accepted May 16, 2024
Available online October 15, 2025

JEL classification: E22, L25, M10, M14

DOI: 10.14254/1800-5845/2025.21-4.3

Keywords:

Intellectual capital,
Corporate social responsibility,
Firm performance,
Threshold effects,
Vietnam

ABSTRACT

In the technology era, intellectual capital is considered by many to be a firm's most important asset. Meanwhile, in economic integration and intense competition, corporate social responsibility is an essential strategy for businesses to grow sustainably. However, while the effects of corporate social responsibility on firm performance have been extensively investigated, the role of intellectual capital to this important link has largely been ignored in the existing literature. As such, this paper examines threshold effect of intellectual capital on this relationship for 60 listed firms Vietnamese listed firms from 2011 to 2021. The generalized method of moments (GMM) and threshold regression method of Hansen (1999) are utilized to ensure the validity and robustness of the study results. In addition, our analysis investigates this relationship for financial firms and non-financial firms separately. The results indicate that intellectual capital and corporate social responsibility improve the performance of financial firms. The findings of this study confirm a U-shaped relationship between corporate social responsibility and firm performance in Vietnam, with a threshold impact of intellectual capital. We contribute to the existing literature by considering the threshold effects of intellectual capital on corporate social responsibility - firm performance nexus for listed firms an emerging market

INTRODUCTION

Intellectual capital refers to the intangible assets of a firm, such as knowledge, skills, experience, and reputation, which are critical for creating and sustaining competitive advantage (Vo & Tran, 2024). Additionally, effective intellectual capital management can enhance a firm's ability to innovate and develop new products (Tran & Vo, 2022), leading to increased revenue and market share (Ahmad et al.,

2022). On the other hand, CSR refers to the voluntary actions taken by firms to address social and environmental issues and contribute to sustainable development (Tran et al., 2022). CSR has become an increasingly important aspect of corporate strategy in emerging markets as companies look to balance their economic, social, and environmental goals (Ahmad et al., 2022). In an emerging market, CSR can also help firms build trust with local communities and stakeholders, which can be essential for long-term success (Baah et al., 2023).

Intellectual capital and CSR are two important factors impacting the performance and success of both financial and non-financial firms. Intellectual capital is typically considered a key driver of competitiveness and success in financial firms. These firms rely heavily on their expertise and reputation to attract and retain customers (Khan et al., 2022). In non-financial firms, intellectual capital is often viewed as just one of many factors contributing to success, with a greater emphasis placed on tangible assets such as manufacturing capabilities and brand recognition (Preston & O'Bannon, 1997).

Regarding CSR, there are also differences between financial and non-financial firms. In the financial sector, CSR is often seen to enhance the firm's reputation and brand image and build trust with customers and stakeholders (Lu & Khan, 2023). In non-financial firms, CSR is often viewed as a way to balance economic, social, and environmental responsibilities and to create long-term value for both the company and society (Pucheta-Martínez et al., 2023). In addition, CSR may be more closely tied to specific business practices, such as reducing greenhouse gas emissions, fair labour practices, and supply chain transparency (Nirino et al., 2022).

Our literature review indicates a need for more research examining the difference between intellectual capital and CSR in financial and non-financial firms in the emerging market. In addition, prior studies have largely neglected to examine the independent effects of intellectual capital and CSR and their combined effect on a firm's performance, especially the threshold impact of intellectual capital on the relationship between CSR and firm performance. These observations motivate us to undertake this study.

This research contributes to the existing body of intellectual capital literature in several ways. *First*, we compare the intellectual capital and CSR differences between financial and non-financial firms. Unlike previous studies, this study compares these aspects in financial and non-financial firms, especially in the COVID-19-induced economic environment. *Second*, this study examines the moderating role of intellectual capital on the CSR-firm performance nexus. This moderating role has been widely studied in developed nations. However, it has largely been ignored in emerging markets like Vietnam. *Third*, for the first time, the relationship between CSR and firm performance is examined under the threshold impact of intellectual capital. Finally, the findings of this study offer recommendations for managers of both financial and non-financial firms on managing and utilizing intellectual capital and CSR effectively, as they are vital resources that can provide long-term competitive advantages and enhance operational efficiency in the modern knowledge-based economy.

Following this introduction, the rest of this study is organized as follows. Section 2 presents a literature review. Section 3 describes the research design and data used in the analysis. Next, the empirical results are discussed in section 4. Finally, section 5 provides the concluding remarks and their practical implications.

1. LITERATURE REVIEW

1.1 Corporate social responsibility and intellectual capital

Brooking (1996) characterizes intellectual capital as the collective intangible assets that enable a company to perform effectively. On a parallel note, various corporate social responsibility (CSR) definitions exist. For instance, Carroll (1979, p. 500) defines CSR as follows: "The social responsibility of business encompasses the economic, legal, ethical, and discretionary expectations that society has of organizations at a given time." According to this widely accepted description, CSR comprises four distinct responsibilities: the economic responsibility to generate profit, the legal responsibility to adhere to regula-

tions, the ethical responsibility to engage in morally sound actions, and the discretionary responsibility to contribute to the well-being of society as a whole (Nirino et al., 2022).

The theoretical linkage between intellectual capital and CSR can be illuminated through the resource-based theory (Tran et al., 2022). According to this theory, firms can secure sustainable competitive advantages by managing resources and capabilities that are valuable, rare, difficult to replicate, and for which no direct substitute exists (Nirino et al., 2022). Intellectual capital is intricate and costly to develop, as they are typically context-dependent, path-dependent, socially intricate, and causally enigmatic. These attributes render these intangible resources and competencies difficult to duplicate or replace (Nirino et al., 2022). Consequently, they are widely acknowledged as the foundation of a company's competitive advantage, potentially enhancing its sustainability (Lewin & Warren, 2023).

1.2 Intellectual capital and firm performance

In today's knowledge-driven global landscape, intellectual capital plays a pivotal role in influencing a firm's performance (Tran et al., 2020). Previous studies have yielded varied findings regarding the impact of intellectual capital on the performance of both financial and non-financial enterprises. For financial firms, recent research indicates a notable positive association between intellectual capital and firm performance (Dalwai et al., 2022; Tran & Vo, 2022). Stahle et al. (2011) findings suggest an indirect connection between intellectual capital and firm performance.

In terms of non-financial firms, Xu & Wang (2019) investigated the correlation between intellectual capital and firms' performance, utilizing data from textile firms in both China and South Korea over the time spanning from 2012 to 2017. Their results unveiled a substantial influence of intellectual capital and its constituent elements on these textile firms' earnings, profitability, and productivity. In a separate study, Yao et al. (2019) employed the MVAIC model to assess the influence of intellectual capital on the profitability and productivity of 111 financial institutions in Pakistan from 2007 to 2018. Their findings established a U-shaped relationship between intellectual capital and profitability. These results imply that an augmentation in intellectual capital enhances profitability and productivity up to a certain threshold. Beyond this point, an increase in intellectual capital has a diminishing effect on firms' performance. Furthermore, these outcomes highlight human capital efficiency as the most impactful driver of firms' performance. Nadeem et al. (2017 determine that intellectual capital efficiency and its constituent elements have a positive and significant effect on firm performance, particularly concerning return on assets and equity.

1.3 The threshold effects of intellectual capital in the relationship between corporate social responsibility and firm performance

Numerous studies advocate allocating resources towards corporate social responsibility (CSR) strategies and elucidate the associated advantages (Surroca et al., 2010). Grounded in the framework of the resource-based theory (Nirino et al., 2022), a firm's intangible assets, specifically its intellectual capital, creativity, experience, and CSR initiatives, among others, assume paramount importance in shaping marketing strategies that yield enhanced profitability. Khan et al. (2022) have underscored the pivotal role of intangible competencies as essential for securing a competitive edge in the marketplace. Thus, intangible resources such as expertise, creativity, CSR activities, and intellectual capital constitute invaluable components that empower a firm's capabilities, particularly in the realm of marketing skills encompassed by the marketing mix (product, place, pricing, and promotion), ultimately facilitating firms in optimizing their performance (Ahmad et al., 2022).

In addition, the emergence of social and environmental concerns presents potential avenues for gaining a competitive edge (Nirino et al., 2022). Indeed, Hart (1995) has extended the purview of the resource-based theory to encompass the idea that knowledge about environmental and social dimensions can contribute to cultivating intangible assets within a firm, thereby culminating in improved firm performance. Firms that allocate resources to CSR strategies can set higher price points for environment-

ally-friendly products. Simultaneously, they can enhance their corporate image, optimize production efficiency, and cultivate ecologically responsible products. These actions collectively contribute positively to the firm's competitive advantages, culminating in elevated long-term performance (Nirino et al., 2022).

The dynamic nature of the impacts of CSR at various intensity levels on firms can result in constantly changing overall effects. Therefore, a simplistic linear relationship is inadequate for capturing the precise patterns (Sun et al., 2019). Despite the recognition of the nonlinear relationship between international construction firms (Wang et al., 2016) and China construction firms (Zheng et al., 2022), little attention has been given to whether such a nonlinear relationship is applicable to both financial and non-financial firms in emerging markets. This aspect remains unclear and warrants further exploration. Hence, examining the threshold effect of intellectual capital in the relationship between CSR and firm performance is necessary, which will contribute to providing empirical evidence for intellectual capital literature.

2. RESEARCH METHODOLOGY AND DATA

2.1 Measurement of intellectual capital

Phusavat et al. (2011) propose the modified value-added intellectual capital (MVAIC) model to measure intellectual capital. The MVAIC model includes additional components of intellectual capital, such as innovation and relational capital (Tran & Vo, 2022). Phusavat et al. (2011) utilize innovation capital as R&D expenses, while Henry (2013) defines relational capital as the sum of available and potential resources derived from individual and organizational networks. Relationships with customers, suppliers, marketing channels, and stakeholders in sales activities also comprise a firm's relational capital (Bontis, 2001). It is worth noting that the MVAIC model has been widely used in empirical analyses to measure intellectual capital at the firm level since its introduction (Dalwai et al., 2022). Hence, this study uses the MVAIC model to measure intellectual capital.

2.2 Measuring corporate social responsibility

There are several methods used to measure corporate social responsibility (CSR). One approach is called the "nominal indices" approach, which includes various indices such as the MSC 400 Social Index, the Vigeo Index, the Fortune Magazine Reputation Index, and the Dow Jones Sustainability Index (Preston & O'Bannon, 1997). The second method, the "content analysis", involves identifying key variables, searching for relevant information, and converting qualitative information into quantitative data for statistical analysis (Abbott & Monsen, 1979). The third method relies on surveys (Rettab et al., 2009), while the fourth one is referred to as "one-dimensional measures" (Cadez & Czerny, 2016). In this study, CSR is measured using the ratio of charitable contributions to total pre-tax profit, which has also been employed in previous studies (Ramzan et al., 2021; Tran et al., 2022). The definitions and measurements of the variables are outlined in Table 1.

Table 1. The definition of variables and measurements

Variables	*Definition*	*Measurements*
Dependent Variables		
ROA	Return on assets	Net Income/Total Assets
ROE	Return on equity	Net Income/Total Equity
Independent Variables		
HCE	Human capital efficiency	HCE = VA/HC - The ratio of value-added divided by HC VA = total profit before taxes + employee expenditures HC = Total employee expenditure
SCE	Structural capital efficiency	SCE = (VA−HC)/VA - The ratio of structural

		capital divided by VA SC = Value added–human capital
RCE	Relational capital efficiency	RCE = VA/RC - The ratio of value-added divided by the relational capital RC = The amount invested in marketing, selling and advertising expenses
CEE	Capital employed efficiency	CEE = VA/CE - The ratio of value-added divided by CE CE = total assets and intangible assets
IC	Intellectual capital	MVAIC = HCE + SCE + RCE + CEE
CSR	Corporate social responsibility	The ratio of total of charitable contributions divided by total profit before tax
IC*CSR	Interaction variable between intellectual capital and corporate social responsibility	Intellectual capital * corporate social responsibility
Control Variable		
SIZE	Total assets	Natural logarithm of the total assets
LEV	Liquidity	The ratio of total debt divided by total assets

Source: own

Our study evaluates the independent and joint impact of intellectual capital and CSR on firm performance through two models, as presented in Table 2.

Table 2. The regression models

Model	*Regression*
1	$ROA_{it} = \beta_0 + \beta_1 ROA_{it-1} + \beta_2 IC_{it} + \beta_3 CSR_{it} + \beta_4 IC*CSR_{it} + \beta_5 SIZE_{it} + \beta_6 LEV_{it} + \varepsilon_{it}$
2	$ROE_{it} = \beta_0 + \beta_1 ROE_{it-1} + \beta_2 IC_{it} + \beta_3 CSR_{it} + \beta_4 IC*CSR_{it} + \beta_5 SIZE_{it} + \beta_6 LEV_{it} + \varepsilon_{it}$

Note: For definitions of the variables, please see Table 1.

2.3 Data

The study uses the panel data technique on a sample of 60 firms categorized into two groups, (i) financial firms and (ii) non-financial firms, to make a comparison for the 2011–2021 period. Data are hand-collected from the annual reports of firms listed on the Ho Chi Minh Stock Exchange.

3. EMPIRICAL FINDINGS AND DISCUSSIONS

3.1 The descriptive statistics

Table 3 summarizes the descriptive statistics of the ROA and ROE dependent variables and the independent variables of intellectual capital and CSR. On average, ROA and ROE have values of 0.046 and 0.125, respectively. The average amount of intellectual capital is 5.404, which means that for every 1.00 VND of intellectual capital used by listed firms in Vietnam, they produce 5.404 VND. Additionally, the average value of CSR is 0.025.

Table 3. The descriptive statistics of the entire sample

Variables	*Observations*	*Mean*	*Min.*	*Max.*	*Std. Dev.*
ROA	644	0.046	0.001	0.905	0.055
ROE	644	0.125	0.001	1.105	0.099
IC	644	5.404	1.001	37.215	5.045
CSR	545	0.025	0.000	0.328	0.040
IC*CSR	580	0.101	0.000	1.322	0.129
SIZE	644	4.004	2.000	14.246	1.517

LEV	644	0.547	0.007	0.949	0.196

Note: For definitions of the variables, please see Table 1.

3.2 The correlation analysis

We perform a correlation test to investigate high correlations between variables. As presented in Table 4, the correlation between the variables is below 0.70. In addition, the variance inflation factor (VIF) analysis is conducted to examine multicollinearity. Our results indicate that all VIF coefficients are lower than 3. As such, the multicollinearity does not appear to be a problem in our analysis (Netter et al., 1989).

Table 4. The pairwise correlation coefficients and the variance inflation factor (VIF) among examined variables

Variables	*ROA*	*ROE*	*IC*	*CSR*	*IC*CSR*	*SIZE*	*LEV*	*VIF*
Financial firms								
ROA	1.000							-
ROE	-	1.000						-
IC	0.282***	0.092*	1.000					1.10
CSR	-0.129**	-0.229***	0.015	1.000				1.00
IC*CSR	0.010	0.078	0.217***	0.038	1.000			1.06
SIZE	-0.332***	0.080	-0.052	0.001	0.086	1.000		1.10
LEV	-0.273***	0.160***	-0.174***	0.039	-0.051	0.273***	1.000	1.14
Non-financial firms								
ROA	1.000							-
ROE	-	1.000						-
IC	0.613***	0.610***	1.000					1.13
CSR	0.003	-0.045	-0.135**	1.000				1.95
IC*CSR	0.169***	0.107*	0.066	0.664***	1.000			2.02
SIZE	-0.028	-0.006	0.030	0.132**	0.289***	1.000		1.13
LEV	-0.319***	0.105*	-0.253***	-0.170***	-0.161***	0.139**	1.000	1.12

Source: Own
Notes: *, **, and *** *are* significant at 10 per cent, 5 per cent, and 1 per cent, respectively.
For definitions of the variables, please see Table 1.

3.3 The independent and joint effects of corporate social responsibility and intellectual capital on firm performance

The generalized method of moments (GMM) technique has been used in this study. This technique can address omitted variables, unobserved firm heterogeneity, measurement error, and endogeneity that commonly impact the estimation (Arellano & Bover, 1995; Blundell & Bond, 1998). Empirical results from the GMM technique are presented in Table 5. The AR (2) test results show no second-order autocorrelation for financial and non-financial firms, as the null hypothesis of "no autocorrelation" cannot be

rejected. In addition, the Hansen test results conclude that the IVs are not endogenous in financial and non-financial firms, validating the use of the GMM estimation technique in this study.

Table 5. The moderating role of corporate social responsibility on the intellectual capital-firm performance nexus

Variables	*Model 1 (ROA)*	*Model 2 (ROE)*
Financial firms		
ROA_{t-1}	1.022***	
ROE_{t-1}		0.502***
IC	0.001***	0.005***
CSR	0.141**	0.279***
IC*CSR	0.004*	0.010*
SIZE	-0.001*	-0.003*
LEV	0.035***	0.134***
Cons	-0.023***	-0.027
AR (2) test	0.269	0.294
Sargan test	0.978	0.000
Hansen test	0.589	0.582
Non-financial firms		
ROA_{t-1}	0.266***	
ROE_{t-1}		0.057***
IC	0.009***	0.016***
CSR	0.162	0.194
IC*CSR	0.161***	0.319***
SIZE	-0.042***	-0.028***
LEV	0.026	0.007
Cons	0.089***	0.080***
AR (2) test	0.969	0.882
Sargan test	0.163	0.000
Hansen test	0.755	0.479

Source: own

Notes: *p<0.10; **p<0.05; ***p<0.01 For definitions of the variables, please see Table 1.

For financial firms, our results indicate that intellectual capital and CSR are important drivers of firm performance. These findings align with previous studies (Ahmad et al., 2022; Nirino et al., 2022). On the one hand, a strong reputation for CSR can help financial firms attract and retain talented employees, thereby strengthening their intellectual capital. On the other hand, investment in intellectual capital can help a financial firm identify and mitigate potential social and environmental risks, thereby enhancing its CSR performance. In addition to their independent effects, intellectual capital also plays a moderating role in the relationship between CSR and the performance of financial firms, in line with Tran et al. (2022).

For non-financial firms, our results confirm that their performance has an important contribution from intellectual capital. However, we find an insignificant relationship between CSR and the performance of non-financial firms. Interestingly, intellectual capital and CSR combined increase firm performance. The combined effect of intellectual capital and CSR on firm performance in non-financial firms is significant because intellectual capital can enhance the benefits of CSR (Nirino et al., 2022). Firms with high levels of intellectual capital are better equipped to understand and address the concerns of their stakeholders, which can result in improved CSR practices.

3.4 The threshold effect of intellectual capital on the corporate social responsibility – firm performance nexus

Our analysis is now extended to examine the existence of different thresholds of intellectual capital on the CSR–firm performance nexus using the threshold regression from Hansen (1999) using the following models.

$$Firm\ performance_{¿} = \mu_i + \eta_1 IC_{¿} + \eta_1 \sum_{j=1}^{n} X_{¿} + \begin{cases} \beta_1 CSR_{¿} I\left(IC_{¿-1} \le \gamma\right) \\ \beta_2 CSR_{¿} I\left(\gamma < IC_{¿-1}\right) + \mu_i + \varepsilon_{¿} \end{cases}$$

In this context, firm performance metrics (ROA, ROE) are proxies for firm performance. CSR represents a regime-dependent variable, indicating a coefficient variation within each regime corresponding to threshold values. IC defines the threshold values, and β is the threshold correlation coefficient associated with cases where threshold values are lower or higher than γ. I(.) denotes an indicator function, and η captures systemically differentiated discrepancies in the model to address the variance in error fluctuations. Control variables X include SIZE and LEV, which are factors that may influence firm performance. μ represents the fixed effect, while ε is the estimation error of the model, assumed to be independent and identically distributed with a mean of 0 and constant variance of $\sigma^2 ¿$.

Table 6. The threshold effects of intellectual capital on the CSR-performance nexus

Threshold estimator	*ROA*	*ROE*
Financial firms		
γ	3.699*	2.825*
95% confidence interval	[3.693; 3.895]	[2.808; 2.828]
Impact of intellectual capital		
β_1 (CSR in low regime)	-0.179*	-0.314***
β_2 (CSR in high regime)	0.239*	0.622*
Covariates		
ROA_{t-1}	0.573***	
ROE_{t-1}		0.604***
IC	0.001**	0.001
SIZE	0.003**	-0.002
LEV	-0.119***	0.189
Cons	0.074***	-0.030
Obs.	80	80
R-squared	0.743	0.651
F test (p-value)	0.001	0.093
Non-financial firms		
γ	7.389	7.389
95% Confidence Interval	N/A	N/A
Impact of intellectual capital		
β_1 (CSR in low regime)	-0.256*	-0.311*
β_2 (CSR in high regime)	0.016	0.573
Covariates		
ROA_{t-1}	0.094	
ROE_{t-1}		0.209*
IC	0.003**	0.011***
SIZE	0.069**	0.100
LEV	-0.213***	-0.117
Cons	-0.085	-0.246
Obs.	70	70
R-squared	0.547	0.608
F test (p-value)	0.001	0.028

Source: own
Notes: *p<0.10; **p<0.05; ***p<0.01 For definitions of the variables, please see Table 1.

The results in Table 6 indicate a U-shaped relationship between CSR and firm performance, depending on the level of intellectual capital. CSR negatively affects firm performance at a lower level of intellectual capital. However, CSR improves firm performance once the intellectual capital exceeds a certain threshold.

Findings from financial firms indicate a dynamic trend of 'initial decline and subsequent improvement' of firm performance as intellectual capital increases. This finding suggests that the positive impact of CSR on firm performance becomes evident once intellectual capital attains a relatively high level. These findings reconfirm conclusions from earlier studies (Wang et al., 2016; Zheng et al., 2022) confirming a nonlinear effect of CSR on firm performance. When intellectual capital grows, firms are better equipped to integrate CSR initiatives into their operations strategically. Firms with strong intellectual capital are more likely to develop innovative solutions that address societal and environmental challenges while simultaneously improving firm performance. Innovations can lead to cost savings, improved resource utilization, and a positive reputation among stakeholders (Nirino et al., 2022).

CONCLUSIONS AND POLICY IMPLICATIONS

This study examines the differences in intellectual capital and CSR between financial and non-financial firms in Vietnam. In addition, we also investigate the moderating effects of intellectual capital on the CSR-firm performance nexus. Using the panel data estimation technique on a sample of 60 firms, including financial firms and non-financial firms, from 2011 to 2021. The generalized method of moments (GMM) estimation technique is used in this study. The results show that intellectual capital and CSR positively and significantly impact financial firms' performance. In contrast, the performance of non-financial firms is mostly driven by intellectual capital. Our results also confirm a threshold effect of intellectual capital on the relationship between CSR and financial firm performance.

Managerial implications have emerged based on the findings from this study. *First*, our findings confirm that non-financial firms have achieved more earnings and better asset utilization than financial firms. However, financial firms are more effective in using their intellectual capital. In addition, non-financial firms focus more on CSR than financial firms. *Second*, our research supports the idea from intellectual capital literature and knowledge-based theory that firms effectively utilizing intangible assets, such as intellectual capital, will experience improved performance over time. Our study highlights the importance of considering intellectual capital when evaluating the relationship between CSR and firm performance. CSR can help develop a firm's intellectual capital to benefit its stakeholders. *Third*, this study contributes to the literature on CSR and stakeholder theory by showing that when a firm invests in CSR initiatives and demonstrates a genuine commitment to social and environmental issues, it can build a positive image and strengthen its relationship with stakeholders, leading to better business performance. The role of intellectual capital in understanding the impact of CSR on firm performance is also emphasized in our study, providing a deeper understanding of when CSR and intellectual capital can be financially beneficial.

Although intellectual capital and CSR play crucial roles in the success of both financial and non-financial companies, the ways these factors are viewed and prioritized vary between the two sectors. For example, financial companies may emphasize improving their image and gaining the trust of their clients and stakeholders. In contrast, non-financial firms might concentrate more on balancing economic, social, and environmental obligations. Ultimately, financial and non-financial firms will succeed based on their ability to effectively incorporate intellectual capital and CSR into their business practices and generate benefits for all parties involved.

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