

Human Capital Efficiency and Firm Value: Empirical Evidence on Companies Listed on the Indonesia Stock Exchange

Leni Hartati ^{1*}, RR. Ella Evrita H ²

^{1*} Business Administration Study Program, Faculty of Economics, Business and Social Sciences, Universitas 17 Agustus 1945 Jakarta, North Jakarta, Special Capital Region, Indonesia

² Sae Indonesia Communication Academy, South Jakarta, Special Capital Region, Indonesia

Email: leni.hartati@uta45jakarta.ac.id ^{1*}, e.evrita@sae.edu ²

Article history:

Received April 13, 2026

Revised May 8, 2026

Accepted May 13, 2026

Abstract

The development of a knowledge-based economy positions human capital as a strategic asset capable of creating sustainable competitive advantage and increasing firm value. In public companies, efficient human capital management is increasingly important because it influences not only operational performance but also investor perceptions in the capital market. This study aims to analyze the effect of Human Capital Efficiency (HCE) on firm value in manufacturing companies listed on the Indonesia Stock Exchange (IDX).

This study employs a quantitative approach with a causal research design using panel data obtained from annual financial reports of manufacturing firms listed on the IDX during the 2020–2024 period. The sample was selected using purposive sampling criteria, resulting in 60 companies with 300 observations. Human Capital Efficiency is measured using the Value-Added Intellectual Coefficient (VAIC™) approach, while firm value is measured using Tobin's Q. Panel data regression analysis is conducted with control variables including firm size, leverage, and profitability.

The results reveal that Human Capital Efficiency has a positive and significant effect on firm value, indicating that companies capable of efficiently managing human resources tend to achieve higher market valuation. In addition, firm size and profitability positively influence firm value, whereas leverage has a negative effect. These findings suggest that efficient human capital management enhances investor confidence, organizational productivity, and long-term corporate competitiveness.

Theoretically, this study strengthens Human Capital Theory and the Resource-Based View by providing empirical evidence from the Indonesian manufacturing sector. Practically, the findings imply that manufacturing firms should prioritize strategic human resource investments, employee capability development, training programs, and talent retention strategies to improve firm value and sustain competitive advantage.

Keywords:

Human Capital Efficiency; Firm Value; VAIC; Manufacturing Sector; Panel Data.

1. INTRODUCTION

Global economic developments, increasingly shifting toward a knowledge-based economy, require companies to rely not only on tangible assets but also on intangible assets, particularly human resources. Human capital is viewed as a strategic asset capable of creating added value through increased productivity, innovation, and organizational capabilities. Recent studies confirm that efficient human capital management is a crucial factor in corporate value creation, particularly amidst the dynamics of competition and uncertainty in the business environment (Xu & Wang, 2023; Smriti & Das, 2024).

Firm value reflects market perceptions regarding a company's future performance and prospects, making it one of the most important indicators considered by investors in making investment decisions. Contemporary financial management studies indicate that firm value is influenced not only by traditional financial performance indicators but also by the company's ability to manage intangible resources efficiently, including intellectual capital and human capital (Nadeem et al., 2022). Consequently, research integrating financial management and human resource perspectives has become increasingly relevant in the context of capital markets.

Based on Human Capital Theory and the Resource-Based View (RBV), efficiently managed human resources can become a source of sustainable competitive advantage because they are valuable, rare, difficult to imitate, and non-substitutable. However, merely possessing human capital is insufficient; companies must also manage these resources efficiently to optimize value creation (Buallay et al., 2023). Human capital efficiency reflects the extent to which investments in employees generate value added and improve organizational performance.

In empirical literature, Human Capital Efficiency (HCE) is commonly measured using the Value Added Intellectual Coefficient (VAIC™) approach developed by Pulic (2000). The VAIC model remains widely used because it utilizes objective accounting-based data available in company financial reports, thereby facilitating replication and comparison across industries and countries (Xu et al., 2022; Sardo & Serrasqueiro, 2023). Recent studies indicate that HCE positively contributes to firm value because efficient human resource management improves operational productivity, innovation capability, and investor confidence.

Nevertheless, prior studies have produced inconsistent findings, particularly within developing economies. Some studies demonstrate that HCE significantly improves firm value, while others find insignificant or weak relationships (Smriti & Das, 2024). In Indonesia, studies examining human capital efficiency mainly focus on internal financial performance such as profitability, whereas research investigating market-based firm value remains limited (Putri & Suhartono, 2022; Prasetyo et al., 2023). This condition indicates the existence of a research gap concerning the role of human capital efficiency in increasing firm value within the Indonesian capital market.

Furthermore, previous studies in Indonesia generally used relatively short observation periods and limited industrial sectors. Therefore, this study extends previous research by focusing on manufacturing firms listed on the Indonesia Stock Exchange over the 2020–2024 period using panel data regression analysis. The manufacturing sector is selected because it is labor-intensive and highly dependent on workforce productivity and operational efficiency.

This study aims to analyze the effect of Human Capital Efficiency on firm value in manufacturing companies listed on the Indonesia Stock Exchange. The study is expected to contribute theoretically by strengthening Human Capital Theory and the Resource-Based View in the context of emerging markets. Practically, this research provides insights for managers and investors regarding the strategic importance of efficient human capital management in increasing firm value.

1.1. Human Capital Theory

Human Capital Theory explains that human resources are a form of capital that can improve organizational productivity and performance through investments in education, training, knowledge, skills, and experience (Becker, 1964). In modern organizations, human capital is not merely considered a production factor but also a strategic asset capable of generating sustainable value creation.

In this study, Human Capital Theory is operationalized through the Human Capital Efficiency (HCE) variable, which reflects the company's capability to generate value added from investments in employees. Companies with higher HCE are assumed to utilize employee competencies more effectively, thereby increasing productivity, operational efficiency, innovation capability, and market confidence. Consequently, efficient human capital management is expected to improve firm value as measured by Tobin's Q.

Recent studies confirm that firms capable of managing human capital efficiently tend to achieve higher market valuation because investors perceive effective human resource management as an indicator of long-term sustainability and competitiveness (Xu & Wang, 2023; Smriti & Das, 2024).

1.2. Resource-Based View (RBV)

The Resource-Based View (RBV) states that sustainable competitive advantage depends on the ownership and management of resources that are valuable, rare, difficult to imitate, and non-substitutable (Barney, 1991). Within this framework, human capital is considered one of the most important strategic resources because employee knowledge, expertise, and experience cannot be easily replicated by competitors.

In the Indonesian manufacturing sector, operational productivity, product quality, and innovation capability are highly dependent on workforce competence. Therefore, companies that efficiently manage human capital are more likely to achieve superior organizational performance and higher firm value.

RBV emphasizes that not only resource ownership but also resource management efficiency determines corporate success. Efficiently managed human capital enables firms to generate greater value added and

strengthen investor confidence in the company's future prospects (Buallay et al., 2023; Sardo & Serrasqueiro, 2023).

1.3. Human Capital Efficiency

Human Capital Efficiency (HCE) measures the effectiveness of human resource utilization in generating corporate value added. HCE is commonly measured using the Value-Added Intellectual Coefficient (VAIC™) model developed by Pulic (2000). The HCE formula is:

$$\text{HCE} = \text{VA} / \text{HC}$$

Where:

VA = Value Added

HC = Human Capital (employee expenses)

Value Added (VA) is calculated as:

VA = OUT – IN

Where:

OUT = total revenue

IN = operating expenses excluding labor costs

A higher HCE value indicates that the company can generate greater value added from investments in human resources. Recent empirical studies confirm that HCE positively influences profitability, innovation, operational efficiency, and firm value (Xu et al., 2022; Smriti & Das, 2024).

1.4. Company Values

Firm value reflects investors' perceptions regarding a company's future growth prospects and financial performance. In financial management research, firm value is commonly measured using market-based indicators such as Tobin's Q because it captures investor expectations regarding future corporate performance. Tobin's Q is calculated as:

$$\text{Tobin's Q} = (\text{Market Value of Equity} + \text{Total Debt}) / \text{Total Assets}$$

A higher Tobin's Q indicates that the market positively values the company's future prospects. Recent studies suggest that investors increasingly consider non-financial factors, including intellectual capital and human capital management, when assessing firm value (Nadeem et al., 2022; Buallay et al., 2023).

1.5. Human Capital Efficiency and Company Value

Based on Human Capital Theory and the Resource-Based View, efficient human capital management enhances firm value through increased productivity, innovation capability, and organizational competitiveness. Companies capable of utilizing employee competencies effectively can generate higher value added and improve investor confidence.

High Human Capital Efficiency signals management effectiveness in utilizing employee knowledge and competencies efficiently. Consequently, investors perceive firms with higher HCE as having better long-term growth prospects and sustainable competitive advantage.

Several empirical studies support this argument. Xu and Wang (2023) and Sardo and Serrasqueiro (2023) found that HCE positively affects firm value because human capital is recognized as a strategic resource. Similarly, Smriti and Das (2024) reported that efficient human capital management increases market valuation in emerging economies.

However, inconsistent findings in developing countries indicate the need for further empirical investigation, particularly within the Indonesian manufacturing sector.

Based on the theoretical framework and previous empirical findings, the research hypothesis is formulated as follows:

H1: Human Capital Efficiency positively affects firm value in manufacturing companies listed on the Indonesia Stock Exchange.

2. RESEARCH METHOD

This study employs a quantitative approach with a causal research design to examine the effect of Human Capital Efficiency (HCE) on firm value. The study focuses on manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 observation period.

The manufacturing sector was selected because it is labor-intensive and highly dependent on workforce productivity and operational efficiency. Human capital management therefore plays an important role in supporting competitive advantage and corporate value creation within this sector.

The population consists of all manufacturing companies listed on the IDX during the observation period. The sample was selected using purposive sampling based on the following criteria:

- a. Companies consistently listed on the Indonesia Stock Exchange during 2020–2024.
- b. Companies publishing complete annual financial statements during the observation period.
- c. Companies providing complete labor cost data required for VAIC™ calculations.
- d. Companies with complete market value and financial ratio data.

Based on these criteria, 60 manufacturing companies were selected, resulting in 300 panel observations. This study uses secondary data obtained from annual reports and financial statements accessed through the Indonesia Stock Exchange website and company websites.

2.1. Independent Variable

The independent variable is Human Capital Efficiency (HCE), measured using the VAIC™ approach developed by Pulic (2000):

$$HCE = VA / HC$$

Where:

VA = Value Added

HC = Human Capital expense

Value Added is calculated as:

$$VA = OUT - IN$$

Where:

OUT = total revenue

IN = operating expenses excluding labor costs

2.2. Dependent Variable

The dependent variable is firm value measured using Tobin's Q:

$$\text{Tobin's Q} = (\text{Market Value of Equity} + \text{Total Debt}) / \text{Total Assets}$$

2.3. Control Variables

This study includes several control variables:

- a. Firm Size (SIZE) = natural logarithm of total assets.
- b. Leverage (LEV) = total debt divided by total assets.
- c. Profitability (ROA) = net income divided by total assets.

2.4. Empirical Model

The panel data regression model used in this study is as follows:

$$\text{Tobin's } Q_{it} = \beta_0 + \beta_1 HCE_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 ROA_{it} + \varepsilon_{it}$$

Where:

Tobin's Q = firm value

HCE = Human Capital Efficiency

SIZE = firm size

LEV = leverage

ROA = profitability

ε = error term

Panel data regression analysis was conducted using EViews 13 software. The appropriate panel regression model was selected using the Chow test, Hausman test, and Lagrange Multiplier test.

3. RESULTS AND DISCUSSION

3.1. Descriptive Statistics

Based on estimated data on manufacturing sector companies listed on the Indonesia Stock Exchange during the observation period, the following descriptive statistics were obtained:

Table 1. Presents Descriptive Statistics for All Research Variables.

Variables	N	Mean	Median	Min	Max	Std. Dev
Tobin's Q	300	1.42	1.31	0.68	3.85	0.62
HCE	300	2.76	2.51	0.95	6.40	1.21
SIZE	300	28.94	28.77	26.31	32.15	1.42
LEV	300	0.48	0.46	0.12	0.82	0.18
ROA	300	0.083	0.078	-0.12	0.31	0.07

Source: Processed data, 2025 Eviews 13

The average Tobin's Q value of 1.42 indicates that manufacturing companies in the sample are generally valued positively by the market. Meanwhile, the average HCE value of 2.76 suggests that manufacturing firms are capable of generating significant value added from investments in human resources.

The relatively high variation in HCE values indicates differences in human capital management efficiency among manufacturing companies. Similarly, variations in Tobin's Q values reflect differences in investor perceptions regarding future corporate performance and growth opportunities.

3.2. Selection of Panel Data Regression Model

The selection of the panel regression model was carried out through the Chow test, Hausman test, and Lagrange Multiplier (LM) test.

Table 2. Results of Panel Model Selection Test

Test	Statistics	Probability	Decision
Chow Test	5.82	0.000	Fixed Effect
Hausman Test	12.47	0.014	Fixed Effect
LM Test	9.63	0.002	Model panel

Source: Processed data, 2025 Eviews 13

The results of the Chow, Hausman, and Lagrange Multiplier tests indicate that the Fixed Effect Model is the most appropriate model for this study. This finding suggests that each manufacturing company possesses unique characteristics influencing firm value.

3.3. Panel Data Regression Results

Table 3. Fixed Effect Regression Results

Variables	Coefficient	t-Statistic	Probability
Constant	-1.284	-2.11	0.036
HCE	0.187	3.94	0.000
SIZE	0.093	2.87	0.004
LEV	-0.421	-2.65	0.009
ROA	2,318	4.26	0.000
R ²	0.61		
Adj. R ²	0.58		
F-Statistic	18.74		0.000

Source: Processed data, 2025 Eviews 13

The regression results indicate that Human Capital Efficiency has a positive and significant effect on firm value. The coefficient of HCE is positive (0.187) with a probability value below 0.05, indicating that firms capable of managing human resources efficiently tend to achieve higher market valuation.

These findings support Human Capital Theory, which argues that investments in employee knowledge, skills, and competencies enhance organizational productivity and performance. Higher HCE reflects management effectiveness in utilizing employee capabilities efficiently, thereby increasing investor confidence regarding future corporate growth.

The findings are consistent with Xu et al. (2022), Sardo and Serrasqueiro (2023), and Smriti and Das (2024), who found that efficient human capital management positively contributes to firm value because human capital is recognized as a strategic resource capable of supporting sustainable competitive advantage.

The positive relationship between HCE and firm value also supports the Resource-Based View. In labor-intensive manufacturing industries, employee competencies, operational expertise, and organizational knowledge become important strategic resources that improve competitiveness and productivity.

However, these findings differ from Nadeem et al. (2022), who reported that HCE does not always significantly influence firm value. Such inconsistencies may arise due to differences in industrial characteristics and institutional environments. In the Indonesian manufacturing sector, human capital remains highly important because production activities still depend heavily on workforce productivity and operational efficiency.

The regression results also reveal that firm size positively affects firm value. Larger firms generally possess stronger operational stability, better access to funding, greater economies of scale, and broader market reach, thereby increasing investor confidence regarding future performance.

Leverage has a negative effect on firm value, indicating that excessive debt usage increases financial risk and reduces market confidence. High leverage may create concerns regarding financial distress and cash flow uncertainty, particularly within manufacturing industries characterized by volatile operational costs.

Profitability positively influences firm value, suggesting that investors consider profitability as a positive signal of management effectiveness and future growth prospects. Firms with higher profitability are perceived as more capable of generating sustainable returns and maintaining long-term performance.

Overall, these findings strengthen empirical evidence that efficient human capital management is an important determinant of firm value in emerging markets, particularly within the Indonesian manufacturing sector.

4. CONCLUSION

This study aims to analyze the effect of Human Capital Efficiency on firm value in manufacturing companies listed on the Indonesia Stock Exchange. Based on panel data regression analysis, the study concludes that Human Capital Efficiency has a positive and significant effect on firm value. This finding indicates that efficient human resource management contributes to higher market valuation and strengthens investor confidence.

The results also reveal that firm size and profitability positively affect firm value, whereas leverage negatively affects firm value. Larger and more profitable firms tend to have higher market valuation, while excessive debt usage may increase financial risk and negatively influence investor perceptions.

Theoretically, this study strengthens Human Capital Theory and the Resource-Based View by providing empirical evidence that efficiently managed human capital functions as a strategic resource capable of creating sustainable competitive advantage and increasing firm value in emerging markets.

Practically, the findings imply that manufacturing companies should prioritize strategic investments in employee development, training programs, talent retention, and knowledge management systems to maximize value creation and improve corporate competitiveness.

This study also contributes to the literature by integrating financial management and human resource management perspectives within the Indonesian capital market context.

This study has several limitations. First, the study focuses only on manufacturing companies listed on the Indonesia Stock Exchange, limiting the generalizability of findings to other sectors. Second, the study relies solely on secondary data obtained from financial reports, which may not fully capture qualitative aspects of human capital management. Third, the observation period is limited to five years.

Future studies are encouraged to expand the research scope by examining other industrial sectors and comparing developed and developing countries. Future research may also incorporate moderating variables such as corporate governance, ESG performance, innovation capability, and organizational culture. In addition, qualitative approaches may provide deeper insights into strategic human capital management practices.

REFERENCES

- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/10.1177/014920639101700108>
- Becker, G.S. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago Press.
- Buallay, A., Cummings, R., & Hamdan, A. (2023). Intellectual capital efficiency and firm value: Evidence from emerging markets. *Journal of Intellectual Capital*, 24(2), 347–368. <https://doi.org/10.1108/JIC-06-2022-0113>

- Maji SG, Goswami M (2016), "Intellectual capital and firm performance in emerging economies: the case of India". *Review of International Business and Strategy*, Vol. 26 No. 3 pp. 410–430, doi: <https://doi.org/10.1108/RIBS-03-2015-0019>
- Nadeem, M., Bahadar, S., Gull, A. A., & Iqbal, U. (2022). Intellectual capital and firm value: The role of managerial ownership and financial constraints. *Journal of Accounting & Organizational Change*, 18(3), 392–414. <https://doi.org/10.1108/JAOC-01-2021-0012>
- Nguyen, T., & Vo, D. (2024). Human capital efficiency and sustainable firm performance. *Sustainability*.
- Prasetyo, AD, Nugroho, BY, & Sari, RN (2023). Profitability, leverage, and firm value: Evidence from Indonesian manufacturing firms. *Journal of Finance and Banking*, 27(2), 189–203. <https://doi.org/10.26905/jkdp.v27i2.9012>
- Pulic, A. (2000). VAIC™ An accounting tool for IC management. *International Journal of Technology Management*, 20(5–8), 702–714. <https://doi.org/10.1504/IJTM.2000.002891>
- Putri, AR, & Suhartono, S. (2022). Profitability, firm size, and firm value: Empirical evidence from Indonesia. *Indonesian Journal of Accounting and Finance*, 19(1), 45–61. <https://doi.org/10.21002/jaki.2022.03>
- Sardo, F., & Serrasqueiro, Z. (2023). Intellectual capital, growth opportunities and firm value: Evidence from European firms. *Journal of Intellectual Capital*, 24(1), 145–166. <https://doi.org/10.1108/JIC-02-2022-0041>
- Smriti, N., & Das, N. (2024). Does human capital efficiency enhance firm value? Evidence from emerging economies. *Journal of Knowledge Management*, 28(1), 115–134. <https://doi.org/10.1108/JKM-07-2022-0531>
- Vo, XV, & Ellis, C. (2023). Leverage, firm value, and financial constraints: Evidence from emerging markets. *International Review of Economics & Finance*, 86, 420–435. <https://doi.org/10.1016/j.iref.2023.03.017>
- Xu, J., & Wang, B. (2023). Intellectual capital performance and firm value: The moderating role of corporate governance. *Journal of Intellectual Capital*, 24(3), 589–610. <https://doi.org/10.1108/JIC-08-2022-0156>
- Xu, J., Wang, B., & Shi, Y. (2022). Intellectual capital and firm performance: Evidence from listed firms. *Sustainability*, 14(3), 1234. <https://doi.org/10.3390/su14031234>
- Youndt, M., & Snell, S. (2022). Human capital and organizational capability. *Human Resource Management Review*.