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The effect of intellectual capital on market performance with bank efficiency as a mediation variable

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Abstract

Research aims: The COVID-19 pandemic caused capital market conditions, especially the banking sector, to decline. Therefore, a strategy is needed to help increase the market value of banking companies so that capital market conditions for the banking sector can be stable. The plan that can be implemented is to properly improve the management of the company's intellectual capital and improve efficiency in these banking companies so that the banking industry can develop and regain its existence in the capital market. This study aims to empirically test and prove the effect of intellectual capital on market performance mediated by banking efficiency.

Design/Methodology/Approach: This study used a quantitative approach with a sample of banking sector companies on the Indonesia Stock Exchange in 2017-2021. The data met the criteria of 37 companies with a total of 117 observations. The banking efficiency testing method used Data Envelopment Analysis (DEA). Furthermore, the analysis of the hypothesis testing phase utilized multiple linear regression methods.

Research findings: The study revealed that intellectual capital positively affected market performance. Second, intellectual capital had a positive impact on banking efficiency. Third, banking efficiency had a positive effect on market performance. Fourth, banking efficiency could fully mediate the relationship between intellectual capital and market performance.

Practical and Theoretical contribution/Originality: This study can provide input to companies to obtain high corporate value and competitive advantage. Thus, companies must pay attention to their intellectual capital. The results of this study were empirical evidence of the resource-based view theory in the utilization of intellectual capital and provided empirical evidence regarding the effect of intellectual capital on market performance through bank efficiency as a mediating variable.

Research limitation: Business efficiency measurement utilized a non-parametric approach using Data Envelopment Analysis which has the limitation that each input and output unit is identical to other units of the same type.

Keywords: Intellectual Capital; Bank Efficiency; Market Performance

JAI Website:

Introduction

The capital market is an essential source of funding for a company. Maintaining existence in the capital market is one of the critical points related to market performance. The company's stock price serves as a proxy for investors' perceptions of the company's performance in the

market. The Composite Stock Price Index (IHSG) movement in Indonesia experienced a significant decline in March 2020, following information that COVID-19 had entered Indonesia. According to Indonesian Stock Exchange records (CNN Indonesia, 2020), the Composite Stock Price Index (IHSG) fell by 26.43%, followed by a decrease in market capitalization of 26.11% to IDR 5,368 trillion.
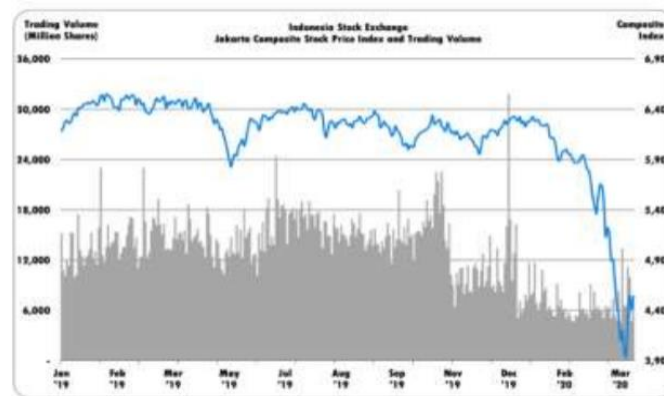

Figure 1 IHSG Chart and Trading Volume on the IDX

Herwany et al. (2021), in their research regarding the effect of the COVID-19 pandemic on stock market returns, denoted that the results of the COVID-19 pandemic had an impact on reducing the value of abnormal returns in several sectors (covering the financial, property, real estate and construction sectors). The financial sector will be most affected if the abnormal return value accumulates during observation. It impacted declining exports, production, and economic activity, as well as uncertainty felt by investors, causing outflows of funds and a depressed rupiah exchange rate (Herwany et al. 2021).

According to the Resources Based View (RBV) theory, a business will have a competitive advantage if it possesses superior resources. Excellent resources are difficult for other companies to imitate. This theory considers knowledge an essential resource for companies as knowledge is an asset that, if appropriately managed, will impact company performance. If the company's performance increases, it will have an impact on the company's continued existence in the capital market, as the information contained in the annual financial report is one of the primary sources of information used, especially by investors in investment decision-making (Dewi & Setyowati, 2015).

Based on the RBV theory, banking companies can survive in the capital market if resources can perform company functions to improve performance. One such resource is intellectual capital. Companies will survive in the fierce global economic rivalry if they can coordinate the growth of their financial and physical capital with their intellectual capital (Sartono, 2015).

Several previous studies have proven that all intellectual capital components positively affect market performance, namely research from Alfraih (2017). Human capital, structural capital, and capital employed are the components of intellectual capital studied in the past. Research related to intellectual capital was also conducted by Utami and Fuad

(2013). The study also stated that intellectual capital positively impacted market performance.

Previous studies have proven that all intellectual capital components positively affect company performance (Sutanto & Iswantaya, 2014; Astawa et al., 2019; Dewi & Setyowati, 2015). Previous research also revealed that several components of intellectual capital, namely employed capital and structural capital, do not affect company performance (Mohapatra et al., 2019). In contrast, Ramadhani et al. (2014) research demonstrated that the performance company is unaffected by human capital since a company cannot guarantee that disclosure in financial statements is adequate solely through using the intellectual capital component.

Based on the research gap explained in the previous discussion, the researcher is motivated to conduct this research. The results of previous research on the effect of intellectual capital on market performance showed mixed results. Therefore, there is still a need to develop more models, especially for handling problems related to declining market performance. Therefore, this study aims to examine the impact of intellectual capital on market performance by adding banking efficiency as a mediating variable. The addition of efficiency as a mediating variable plays a role in clarifying how the mechanism of intellectual capital influences market performance.

The choice of bank efficiency as mediation was reflected in the research of Gardener et al. (2011) as an effort to investigate the determinants of banking efficiency in the Southeast Asian region, one of which is Indonesia, after the financial crisis that occurred in 1997. Bank efficiency was chosen as mediation as previous research has also examined bank efficiency after the financial crisis occurred in 1997. The similarity with the current condition of bank efficiency was investigated shortly after the COVID-19 pandemic, considering that the most affected sector was the financial sector (Herwany et al., 2021). In addition, there have not been any similar studies to date.

The efficiency level of a banking signal can be used as a function to assist the intellectual capital variable in explaining its effect on market performance. As an essential position holder in the Indonesian financial system, banking is required to perform well. A critical aspect of measuring banking performance is efficiency, which can be increased by reducing costs in the production process (Eltivia, 2013). Therefore, banking efficiency needs to be controlled to achieve a competitive advantage. The more efficient the process of producing goods or services is, the higher the added value of the goods or services produced will be (Jamali et al., 2015).

Companies will have a competitive advantage and good performance by reducing inefficiencies in an organization or company. In line with this view, the banking sector must operate efficiently, soundly and stably to achieve optimal performance and promote sustainable economic growth. Empirical research conducted by Sudiyatno and Fatmawati (2013) on banks listed on the Indonesia Stock Exchange showed that operational efficiency affects bank performance and will increase these companies' market valuation. Based on these conditions, research on the effect of intellectual capital on market

performance mediated by banking efficiency is an interesting phenomenon to identify. This research can provide a theoretical contribution to developing the theory of the importance of managing intellectual capital to increase company performance. The existence of banking companies in the capital market remains stable. Furthermore, practical contributions to companies are expected to provide input in applying sustainability principles to their business activities as banks implement good intellectual capital management, which will impact the existence of banking companies in the capital market.

Literature Review and Hypotheses Development

Resources-Based View Theory

Wernerfelt (1984) was the first to develop the Resource-Based View (RBV) theory. The company's resources, management, and utilization are the subjects of the RBV theory. The company must utilize and develop its sources of capital, one of which is intellectual capital, to gain a competitive advantage. Intellectual capital is an essential resource and plays a role in establishing a competitive advantage (Prasetyo et al., 2009). This theory, therefore, assumes that companies can manage their resources by the capabilities of their competitors to gain a competitive advantage (Randa & Solon, 2012).

Signaling Theory

Spence (1973) first introduced the signaling theory in his research on job market signaling. Signaling theory indicates that organizations will try to provide positive signals or information to potential investors through disclosure in the company's annual report (Whiting & Miller, 2008). Therefore, when information is announced and received by the market, market players or business people will analyze and interpret the information received, whether as a good signal (good news) or as a bad signal (bad news) (Brigham & Houston, 2006).

Hypothesis development

An idea called the Resources Based View (RBV) theory states that a company will gain a competitive advantage if it has superior resources. Based on the RBV theory, market performance and banking efficiency can be achieved if resources carry out corporate functions. One such resource is intellectual capital. It is an essential part of the company, believed to improve company performance and achieve competitive advantage.

Previous research by Arif et al. (2023) revealed that intellectual capital positively affects market performance. Intellectual capital is a unique resource that can hardly be imitated. Intellectual capital is an essential resource for achieving a company's competitive advantage. Similar results were also obtained in the study of Obeidat et al. (2021), demonstrating a significant influence between intellectual capital and market performance. This study recommends that companies focus more on intellectual capital

and show its value in annual financial reports. Based on the description above, the research hypothesis can be formulated as follows:

H_1: Intellectual capital has a positive effect on market performance.

Banking efficiency is an indicator of banking performance. Banking efficiency is an indicator in measuring the overall performance of banking activities. The company's resources and their management and utilization are the subjects of the RBV theory. A potential strategy to improve company performance is to unite tangible and intangible assets (Randa & Solon, 2012). Companies must utilize and develop sources of company capital, including intellectual capital, to gain a competitive advantage.

Previous research has proven that intellectual capital positively affects company performance (Astawa et al., 2019; Dewi & Setyowati, 2015; Le et al., 2022). The components of intellectual capital used in previous studies consist of human capital, structural capital, and employed capital. Further observations revealed that human capital has more influence on bank efficiency than other components (Le et al., 2022).

The ability and knowledge possessed by the bank will significantly affect its efficiency level of the bank. Intellectual capital is an asset that can be used to assist banks in increasing their efficiency. Thus, the higher the intellectual capital is, which in this study is proxied by VAIC, the higher the level of banking efficiency will be. Based on the description above, the research hypothesis can be formulated as follows:

H_2: Intellectual capital has a positive effect on bank efficiency.

The signal theory explains the importance of information issued by the company to the investment decisions of external parties. One of the pieces of information investors consider in predicting stocks is the level of banking efficiency. Suppose banking efficiency is in an efficient condition. In that case, it will be a good signal for investors and impact fluctuations in banking company stock prices, namely an increase in share prices and vice versa.

The company's goal is to achieve the welfare of its owners, which is indicated by the valuation of the share value. Harrathi (2019) examined bank efficiency regarding market performance at banks listed in Bahrain, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates. The findings showed that companies that have increased efficiency will increase competition in the stock exchange. Similar results were obtained in Srairi and Kouki's (2015) research. Based on the description above, the research hypothesis can be formulated as follows:

H_3: Bank efficiency has a positive effect on market performance.

The company will perform better if its resources are utilized to their full potential. Banks must invest more in their human resources to achieve a competitive advantage (Mohapatra et al., 2019). Research by Onumah and Duho (2020) revealed that intellectual capital could increase bank efficiency. Furthermore, Srairi et al. (2015) proved that the percentage change in bank share prices reflects changes in the percentage of bank efficiency. Therefore, bank efficiency provides essential information related to stock price performance which market movements cannot explain. Therefore, more efficient banking is expected to obtain optimal profits, more loan funds, and better customer service quality (Eltivia et al., 2013). Based on the description above, the research hypothesis can be formulated as follows:

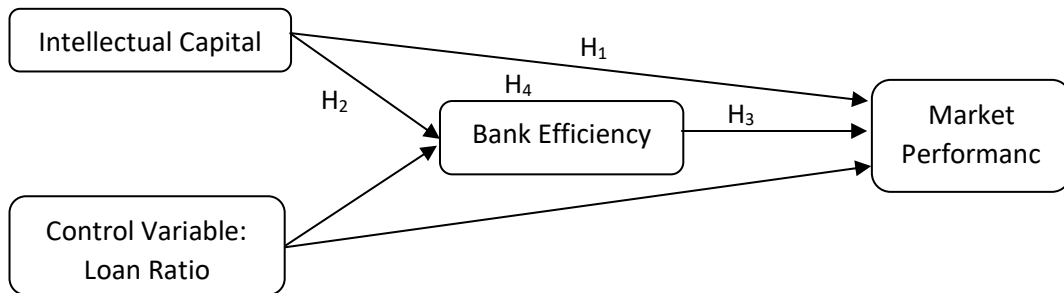*H_4: Intellectual capital has a positive effect on market performance through banking efficiency.*

Figure 2 Conceptual Framework

Research Method

The research approach utilized in this study is a quantitative approach using a positive paradigm. This type of research is explanatory research with causal purposes. This study's population was banks listed on the Indonesia Stock Exchange from 2017-2021. The banking sector was chosen as the research sample as this sector was most affected by the COVID-19 pandemic, which indicated a significant decrease in the value of abnormal returns (Herwany et al., 2021). Sampling used a purposive sampling technique with a judgment sampling type as the sample was selected with specific considerations adjusted to the research objectives. Based on the specified criteria, the sample in this research was 117 observers conducting documentation techniques in data collection. The data was in the form of secondary data obtained from the company's annual report, which was published on the website of the Indonesia Stock Exchange (www.idx.co.id).

This study used four variables, and the followings are the definitions and measurements used (Table 1).

Table 1 Measurement Variables

Variables	Measurement	Sources
Market Performance	The company's ability to increase the value of its shares in the capital market. The measurement method used is the stock return.	Goel et al. (2020)
Intellectual Capital	Information and knowledge are applied in work to create value. The measurement used is the calculation of Value Added Intellectual Capital (VAIC).	Obeidat et al. (2021)
Bank Efficiency	Comparison between input and output (results), benefits and costs, and results and sources used. Measurements used Data Envelopment Analysis (DEA).	Gardener et al. (2011)
Loan Ratio	The loan-to-deposit ratio measures a bank's ability to finance its loans through deposits. The measurement used is the Loan Deposit Ratio (LDR)	Belasri et al. (2020)

Technical data analysis in this study was carried out in stages, namely: (1) measuring the efficiency level of the banking system using the DEA method; and (2) examining the effect of the dependent variable on the independent variables and mediating variables. The first researcher tested the bank's efficiency and prepared DMU data by predetermining inputs and outputs. Furthermore, it was inputted into tables and Run Model data that has been prepared according to the Variable Return to Scale (VRS) method with an input-oriented approach. Each unit in the sample was considered to have an efficiency level that was not negative, and the value was between 0 and 1 with the condition that one indicated perfect efficiency.

Partial hypothesis testing aims to determine the effect and significance of each independent variable on the dependent variable. This study's confidence coefficient was 95%, and the degree of error (α) was 5%. The analytical method used in this research was multiple regression analysis using SPSS. Based on the model, the regression equation to be searched for and tested for its coefficients is as follows:

$$MP = \alpha + \beta 1(IC) + \beta 2(LDR) + e \quad \text{..} \quad (1)$$
$$BE = \alpha + \beta 3(IC) + \beta 4(LDR) + e \quad \text{..} \quad (2)$$
$$MP = \alpha + \beta 5(BE) + e \quad \text{..} \quad (3)$$
$$MP = \alpha + \beta 6(IC) + \beta 7(BE) + \beta 8(LDR) + e \quad \text{..} \quad (4)$$

Where MP describe for market performance; BE for bank efficiency; IC for intellectual capital; LDR for loan ratio; α for constant; β for regression coefficient; and e for residual error. It is necessary to complete the classical assumption test to anticipate whether there is bias in the resulting regression model. The classic assumption test used includes normality, multicollinearity, and heteroscedasticity.

Result and Discussion

The results of the descriptive statistical tests in Table 2 show the minimum, maximum, average, and standard deviation values of the dependent variable (market performance), independent variable (intellectual capital), mediating variable (banking efficiency), and control variable (loan ratios). The Market performance variable has a minimum value of -0.326, a maximum value of 0.679, an average value of 0.044, and a standard deviation value of 0.021. A normally distributed data is indicated when the mean value is greater than the standard deviation.

Table 2 Results of Descriptive Statistics

Variable	Minimum	Maximum	Average	Std. Deviation
Market Performance	-0.326	0.679	0.044	0.021
Intellectual Capital	-3.052	9.575	3.050	1.581
Bank Efficiency	0.419	1.000	0.782	0.187
Loan Ratio	0.120	1.630	0.839	0.235

Intellectual Capital has a minimum value of -3.052, a maximum value of 9.575, an average value of 3.055, and a standard deviation value of 1.581. A normally distributed data distribution is indicated when the mean value is greater than the standard deviation. Bank Efficiency has a minimum value of 0.419, a maximum value of 1, an average value of 0.782, and a standard deviation value of 0.187. The fact that the mean value is greater than the standard deviation indicates a normally distributed data distribution. The loan ratio has a minimum value of 0.120, a maximum value of 1.630, an average value of 0.839, and a standard deviation value of 0.235. The fact that the mean value is greater than the standard deviation indicates normally distributed data.

Classic Assumption Test

The results of the classic assumption test, which consists of the normality test, multicollinearity test, and heteroscedasticity test, are presented in the following table.

Table 3 Normality Test Results

Regression Equation	Kolmogorov-Smirnov Z	Asymp. Sig.
MP = 0.140 + 0.032 IC − 0.230 LDR	1.122	0.190
BE = 0.435 + 0.059 IC + 0.198 LDR	1.091	0.177
MP = -0.190 + 0.299 BE	1.113	0.083
MP = -0.029 + 0.009 IC + 0.388 BE − 0.307 LDR	1.106	0.251

In this study, the normality test was carried out using the Kolmogorov-Smirnov test. A regression equation is considered free from normality problems if the asymptotic significance of the test results is more than α 5%. The table shows the normality test results for all regression equations in this study. All regression equations are free from normality problems as the asymptotic significance values for all regression equations are more than 0.05.
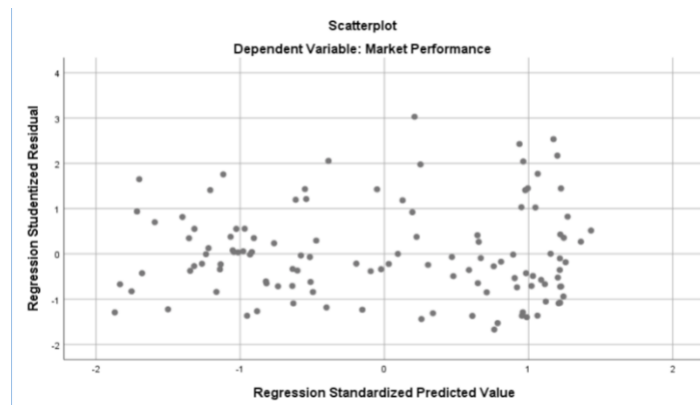
Figure 2 Scatterplot Graph

This study utilized a scatter plot graph to determine whether there was a problem of heteroscedasticity. There is no discernible pattern and the points distributed above and below the number 0 on the Y axis, so the heteroscedasticity test results shown in Figure 2 are unaltered.

Multiple regression analysis in this study is employed to determine the effect of intellectual capital on market performance mediated by banking efficiency. The regression analysis results in this study are shown in Table 4 below.

Table 4 Results of Multiple Regression Analysis

	Coefficient	t value	Sig.	VIF	Tolerance
H_1 : MP = α + β1(IC) + β2(LDR) + e					
Constant	0.140	1.876	0.032		
IC	0.032	2.607	0.005	1.030	0.971
LDR	-0.230	-2.812	0.003	1.030	0.971
F value	6.283				
Adjusted R2	0.083				
H_2 : BE = α + β1(IC) + β2(LDR) + e					
Constant	0.435	7.882	0.000		
IC	0.059	6.593	0.000	1.030	0.971
LDR	0.198	3.277	0.001	1.030	0.971
F value	31.717				
Adjusted R2	0.346				
H_3: MP = α + β1(BE) + e					
Constant	-0.190	-2.292	0.012		
BE	0.299	2.903	0.002	1.000	1.000
F value	8.427				
Adjusted R2	0.060				
H_4 : MP = α + β1(IC) + β2(BE) + β3(LDR) + e					
Constant	-0.029	-0.322	0.374		
IC	0.009	0.632	0.264	1.423	0.703
BE	0.388	3.184	0.001	1.556	0.642
LDR	-0.307	-3.728	0.000	1.127	0.887
F value	7.903				
Adjusted R2	0.151				

The analysis test results in Table 4 show that all research hypotheses (H_1, H_2, H_3, and H_4) have a probability value of less than 5% with a positive coefficient value. It shows statistically, and then the entire research hypothesis is acceptable.
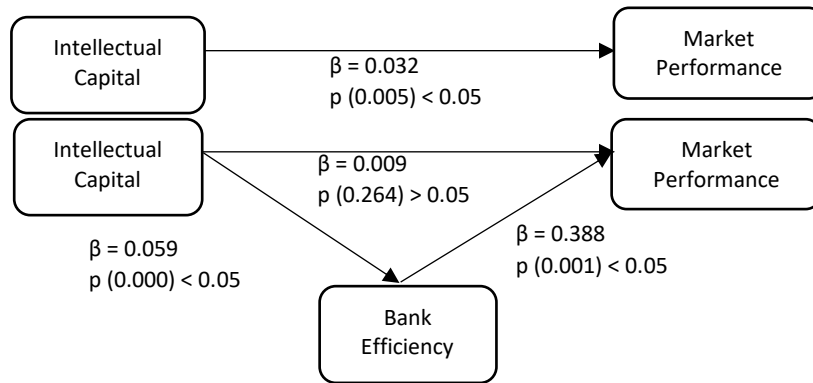

Figure 3 Hypothesis Testing Results

Figure 3 demonstrates that after being mediated by banking efficiency, the intellectual capital variable has a regression coefficient of 0.010 with a probability value greater than α: 5%, which is 0.515 (ρ <0.05). Meanwhile, the banking efficiency variable has a regression coefficient value of 0.255 with a probability value smaller than α: 5%, which is 0.041 (ρ <0.05). The results of this study indicated that the banking efficiency variable as a mediating variable leads the intellectual capital variable not to affect market performance. According to Hayes (2009), it is consistent with the theory that if the mediating variable's effect on the dependent variable is significant and the effect of the independent variable on the mediating agent is not significant, fully mediated mediation will occur.

The novelty of the results of this study is that intellectual capital has a positive effect on market performance through bank efficiency, where bank efficiency can fully mediate the relationship between variables. These findings implied that companies that have utilized intellectual capital could increase banking efficiency, which affects market performance. This condition indicated that achieving banking efficiency, which has an average efficiency level of 78.2%, can increase the influence of intellectual capital on market performance. This situation reflects using intellectual capital to encourage and improve market performance.

Companies that manage their intellectual resources optimally can create added value, thereby increasing market performance. This study revealed that banks have realized the importance of intellectual capital in creating a competitive advantage. The findings in this study support the results of previous research conducted by Obeidat et al. (2021) identifying the factors that influence financial market performance in industrial companies on the Amman Stock Exchange. Market performance increases along with intellectual capital. The company's market value will automatically rise together with the expansion of its intellectual capital.

Banks will win a competitive competition if they improve efficiency by adequately managing their intellectual capital (Astawa et al., 2019; Dewi & Setyowati, 2015; Le et al., 2022). The components of intellectual capital used in previous studies consisted of human capital, structural capital, and employed capital. One significant component of human capital is that a bank with better human capital can create significant added value and produce higher efficiency (Onumah & Duho, 2020).

Banking plays a crucial role as an intermediary institution and must function well. Efficiency is one of the critical indicators for assessing banking performance, and it may be raised by minimizing cost (Aftab et al., 2011). Efficiency is a principle that forms the basis for preparing safe and sound banking arrangements. The study's findings demonstrated that bank efficiency favorably impacted market performance. The market performance demonstrates that the market reacts and evaluates outstanding shares. Stock prices will demonstrate how investors evaluate a company's performance. Based on the information, investors evaluate a company's value. One of the pieces of information investors consider in predicting stocks is the level of banking efficiency (Harrathi, 2019; Srairi & Koukis, 2015). If banks are in an efficient condition, it will be a good signal for investors and impact increasing company stock prices.

The findings in this study support the Resources Based View (RBV) theory which explains the idea that a company will achieve a competitive advantage if it has superior resources. Therefore, in facing the dynamics of an ever-evolving economy, intellectual capital is an essential part of the company, which is believed to improve market performance and achieve competitive advantage (Barney, 1991). In this context, employees in their position as stakeholders have been able to maximize their intellectual abilities to create added value for the company, thus creating a competitive advantage reflected in market-based company performance.

Overall, based on the results of the study, intellectual capital implies a balance between economic, environmental, and maximizing company assets for stakeholders so that they are required to carry out efficiency in implementing the concepts of sustainability, responsibility, accountability, transparency, and social responsibility (Vitezić, 2011). Business efficiency is a strategic tool essential in tackling increasing competitive pressures and structural changes in financial institutions.

Conclusion

The research results demonstrated that intellectual capital significantly influenced market performance. Based on the results of this study, companies are starting to pay attention to utilizing their intellectual capital to create added value for the company. The same results are also found in banking efficiency tests on market performance. Efficient companies can better minimize expenses that cause inefficiency and maximize output so that investors' valuation of company shares will increase. The findings also demonstrated that bank efficiency mediated between increased market performance and intellectual

capital. Efficiency strategies implemented by management can encourage company concern for utilizing its intellectual capital to improve market performance.

Empirical evidence from the results of the research conducted has several implications. First, the theoretical implication is that the results of this study support the importance of a resource-based view theory (RBV) perspective in utilizing corporate intellectual capital as an intangible resource. Second, in terms of practical implications, the results of this study can provide input to companies to obtain high corporate value and competitive advantage. Companies must pay attention to their intellectual capital. In the current knowledge economic era, developing human capital competencies will create value creation in innovation through technology and systems that continue to develop in providing added value to stakeholders.

Furthermore, some limitations in this study can provide direction for further research development. Business efficiency measurement utilized a non-parametric approach using Data Envelopment Analysis which has the limitation that each input and output unit is identical to other units of the same type. Besides, in this study, market performance was only measured by stock returns as a description of the company's short-term achievements.

Based on the limitations of the research, several suggestions are proposed to develop further research. Future research is expected to develop research using a parametric approach to analyze banking efficiency. Future research is also expected to be able to develop company performance indicators, such as Tobin's Q, as market performance that describes the company's long-term performance. In addition, future research is expected to use other company sectors on the Indonesia Stock Exchange to provide more comprehensive information and make a more theoretical, practical, and policy contribution.

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