EFFECT OF INTELLECTUAL CAPITAL ON FIRM VALUE

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Abstract
Modernization has made business competition increasingly fierce, requiring companies to change their business methods to knowledge-based business. This change has resulted in business people being increasingly focused on prioritizing intangible assets as measured by intellectual capital in increasing company value. The goal of this research was to find out the impact of intellectual capital, as measured by VAIC, on firm value, as measured by PBV. The population of this study consists of manufacturing firms listed on the Indonesia Stock Exchange (BEI) between 2017 and 2019. In the study sample, 62 manufacturing companies were selected using the purposive sampling process. Simple linear regression analysis was used in the data analysis methodology. According to the findings of this report, intellectual capital has a significant impact on firm valuation. The implication of the results of this study is that investors will pay more attention to companies that have better intellectual capital. In other words, investors have considered the influence of intellectual property owned by the company in appreciating the market value of a company.

Keywords: intellectual capital, firm value.

1. Introduction
In the new era, the modern world is evolving concurrently with technical advancements. The occurrence of the industrial revolution 4.0, in which information and communication technology is completely exploited, gives rise to a digital-based business model. In 2019, the Indonesian government launched "Making Indonesia 4.0" as a strategy for business 4.0, to increase the value-added of the domestic manufacturing industry so that it can compete internationally. This has resulted in more strong market rivalry, necessitating a shift in business methods to knowledge-based firms. Information assets are an important element in sustaining a company's strategic advantage in a knowledge-based business model. Previously, corporations used tangible assets as a base, but now they are beginning to recognize the role and potential of intangible assets in growing the success and value of their businesses (Fajarini and Firmansyah, 2012). This shows that business people are increasingly focused on emphasizing intangible assets as measured by intellectual capital in increasing firm value so that companies can excel in competing with competitors (Resource-Based Theory). Based on the Resource-Based Theory approach, It is possible to conclude that the growth in firm value can be caused by an increase in company performance which is influenced by the resources owned by the company (Widarjo, 2011).
Intellectual capital is a valuable and costly asset in today's business world. The optimum management of intellectual capital is thought to be capable of increasing a company's market value, as reflected in the stock price. This human capital phenomenon arose in Indonesia following the publication of Statement of Financial Accounting Standards (PSAK) No.19 (revised 2000) on intangible assets. Intangible assets that indirectly represent intellectual capital are described in the Statement of Financial Accounting Standards (PSAK) No. 19 paragraph 09 as intellectual property rights, research and technology, design and development of new systems, and market awareness (Ulum, 2009:3).

There has been attracting attention regarding the effect of intellectual capital in increasing firm value, but there has been no direct measurement of intellectual capital. According to Pulic (1998), the quality of the value-added given by the company's intellectual power, or the Value Added Intellectual Coefficient, may be used to indirectly assess intellectual resources (VAIC). The three major components of VAIC are physical labor (Value Added Capital Employed - VACE), human capital (Value Added Human Capital - VAHC), and institutional capital (Structural Capital Value Added - SCVA). It notes that intellectual capital can be described indirectly by the productivity of the added value provided by a company's intellectual capacity, or the Value Added Intellectual Coefficient (VAIC). According to Pulic (1998), the primary aim of a knowledge-based economy is to produce value-added, which requires a calculation that can be realized if there is sustainability in the use of physical and financial capital, as well as efficiency in the use of intellectual capital. Sunarsih and Mendra (2019) said that the greater the importance of human resources (VAIC), the more effective the usage of business capital would be, thus increasing the added value for the company.

The VAIC process starts with a company's potential to generate value-added. The value-added metric becomes a very objective measure of the potential of an organization to produce firm value (Pulic, 1998). The discrepancy between output (OUT) and input (IN) is used to quantify value-added. The output reflects revenue, which comprises all goods and services provided in the industry, while the input represents all expenses incurred to gain income (Tan et al., 2007). Because of their active involvement in the value development process, employee costs are not included in the input component, so intellectual considerations (represented by employee costs) are not considered as costs and are not included in the input component. (Pulic, 1998 in Handayani, 2015).

Several prior researchers have studied intellectual capital, including Audreylia and Ekadjaja (2014) who conducted research on banking firms listed on the Indonesia Stock Exchange from 2008 to 2012 and discovered that intellectual capital (VAIC) had a beneficial impact on financial efficiency. In 2005-2008, Baroroh (2014) found that intellectual capital (VAIC) has a positive impact on the financial success of manufacturing firms listed on the Indonesia Stock Exchange. Jacub (2012) published a similar study, examining the impact of intellectual capital on pharmaceutical company valuation listed on the Indonesia Stock Exchange between 2006 and 2010. According to this report, human capital (VAIC) has a good impact on the firm value.

However, different findings obtained by Aida dan Rahmawati (2014) who researched the impact of intellectual capital on firm value with company success as an intervening effect, found that
intellectual capital did not affect firm value. Similar results were obtained by Widarjo (2011) who researched the impact of intellectual capital and intellectual mode disclosure on the valuation of companies undertaking initial public offerings, obtained similar results (IPOs). According to the findings of this study, intellectual capital has no impact on firm valuation.

Based on the theoretical explanation given above, this study aims to find out whether intellectual capital influences firm value in manufacturing companies listed on the Indonesia Stock Exchange between 2017 and 2019. The Value Added Intellectual Coefficient (VAIC) developed by Pulic (1998) is used to quantify intellectual capital in this analysis. Meanwhile, the price to book value (PBV) ratio is used to calculate the size of a company's value, which is the ratio between the share price and the book value per share. (Ang, 1997 in Putra, 2012).

2. LITERATURE REVIEW

2.1 Resource-Based Theory
The Resource-Based Theory describes how a company's performance would be optimal if it has a competitive advantage that allows it to generate value for the company. (Wernerfelt, 2012) argues that based on the Resource-Based Theory point of view, companies will get good company performance and excel in business competition by owning, monitoring, and utilizing important strategic assets (tangible and intangible assets). In strategic management theory, competitive advantage can be obtained from the advantages of existing resources (Solikhah et al., 2010). Investors would put a high valuation on businesses with a greater ability (intellectual capital) (Belkaoui and Riahi, 2003). Companies that can manage resources effectively and efficiently can create competitive advantages to create value for the company. In Resource-Based Theory, it assumes that how the company gets a competitive advantage will be an added value for the company by managing the resources owned by the company properly according to the capabilities of the company.

2.2 Intellectual Capital
Intellectual capital, which is built on intelligence, is a valuable resource. Intellectual capital is described by Williams (2001) as "information and expertise that can be used in a job to generate value for the business." Pramestiningrum (2013) argued that intellectual capital is an intangible asset that affects management decisions and has an effect on company results. In addition, Bukh et al. (2005) stated that intellectual capital is an information resource in the form of staff, clients, systems, or technology that businesses may use to create company value. Kalkan et al. (2014) argued that there are three fundamental components of Intellectual Capital: human capital, consumer capital, and institutional capital.

2.3 Firm Value
Prastiwi and Walidah (2020) argued that the investor's view of the performance of the company's management is reflected in firm value. Firm value is the investor's view of the business and is often correlated with the stock price of the company (Rodoni dan Ali, 2014). Cahyadi (2012) in Subaida et al. (2018) argues that firm value is a measure used by investors as a framework for decision-making to gain a competitive advantage. It is possible to say that firm value is an investor's perception of a company, with a company that can provide shareholder prosperity
forming a high-value company, as expressed in its share price. The company must be able to carry out company management in a competent way to optimize the company's value and make the company's prospects visible.

3. Hypotheses Development

3.1 Effect of Intellectual Capital on Firm Value

As per Resource-Based Theory, intellectual resource ownership and efficient use will increase competitive advantage and added value for the business. The efficient use of resources will encourage the creation of value-added for the company to increase the attention of investors. Chen (2005) in Lestari (2016) argued that companies that have better resources will be able to increase market perceptions of firm value because they are considered to have a competitive advantage so that the company can survive in a dynamic business environment. As a result, investors would respond positively by investing in companies with high intellectual capital. Investor investments are a measure of a company's worth, the greater the capital provided by investors, the greater the value of the company. Sudibya dan Restuti (2014) argued that companies can create firm value by optimally managing the components of intellectual capital. Indrajaya (2015) used a sample of manufacturing firms in Indonesia to perform an analysis on the impact of intellectual capital on firm valuation. According to the findings of these studies, intellectual capital has a positive impact on firm valuation. The hypothesis in this analysis is based on this explanation:

H1: Intellectual Capital has a positive effect on firm value.

4. Research Method

4.1 Data Types and Sources

The type of data used in this study is secondary data, which is data obtained from the results of data collection from second parties (Wiyono, 2011 in Indrajaya, 2015). Secondary data is obtained from the financial statements of manufacturing firms listed on the Indonesia Stock Exchange for 2017-2019, which can be viewed via the website www.IDX.co.id.

4.2 Population and Sample

This study's population consists of all manufacturing companies listed on the Indonesia Stock Exchange between 2017 and 2019. While the sample in this study was determined using the purposive sampling process, which entails selecting a sample from a population-based on specific criteria (Jogiyanto, 2010). The sample size in this analysis was calculated using the following criteria:

b) Manufacturing firms that issued financial and annual reports during the 2017-2019 observation period
c) Manufacturing companies that do not have negative equity and profits during the observation period, namely 2017-2019 respectively.
d) Manufacturing companies that were not delisted during the observation period, namely 2017-2019
e) Manufacturing firms whose financial statements include the Rupiah currency.
Based on these criteria, a research sample of 186 manufacturing companies was obtained.

4.3 Operational Definition
4.3.1 Independent Variable
In this analysis, the independent variable is intellectual capital. Bukh et al. (2005) declare that intellectual capital is an information resource in the form of staff, clients, systems, or technology that businesses may use to create firm value. VAIC, Pulic's intellectual capital calculation model that combines three major organizational components, is used to calculate intellectual capital (human capital, structural capital, and customer capital). Several steps are needed to calculate VAIC, which are as follows:

a. VA

The formula for measuring VA is:
\[
VA = OUT - IN
\]

b. VACE

The formula for measuring VACE is:
\[
\frac{VA}{CE}
\]

c. VAHC

The formula for measuring VAHC is:
\[
\frac{VA}{HC}
\]

d. Menghitung VASC

The formula for measuring VASC is:
\[
\frac{SC}{VA}
\]

e. VAIC

The formula for measuring VAIC is:
\[
VAIC = VACE + VAHC + VASC
\]

Information:
VA: Value Added
OUT (Output): Total revenue and other sales
IN (Input): Expenses and expenses except for employee expenses
CE (Capital Employed): Equity
HC (Human Capital): Employee expenses
SC (Structural Capital): VA – HC

4.3.2 Dependent Variable
In this analysis, the dependent variable is firm value. Firm value is the investor's view of the business and is often correlated with the stock price of the company (Rodoni dan Ali, 2014). The PBV (Price to Book Value) ratio, which is the ratio between the closing share price and the book value per share, is used to calculate firm value. PBV can be used to determine how much the market values a company's book value. The great the PBV value generated, the greater investor trust in the company's prospects. PBV is calculated using the formula:
4.4 Data Analysis Techniques
As a data analysis methodology, this thesis employs basic linear regression analysis. The test starts with the classic assumption test, which assumes that if the data is normally distributed, there is a linear relationship, no heteroscedasticity, and no autocorrelation. Furthermore, hypothesis testing is performed using the coefficient of determination (R²) test to determine the extent to which the dependent variable can be clarified by the independent variable, and use the t regression test to determine if the dependent variable can be affected by the independent variable.

5. Results
5.1 Classic Assumption Test
The classical assumption test attempts to determine if the data is suitable for use in the simple linear regression model. If the data is usually distributed, the dependent variable and the independent variable have a linear relationship, there is no heteroscedasticity symptom, and there is no autocorrelation symptom, the data meets the eligibility criteria of a simple linear regression model.

5.1.1 Normality test

Table 1
The results of the normality test

<table>
<thead>
<tr>
<th></th>
<th>Log X</th>
<th>Log Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>115</td>
<td>115</td>
</tr>
<tr>
<td>Normal Parameters Mean</td>
<td>0.3528</td>
<td>-0.1392</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>0.11818</td>
<td>0.28905</td>
</tr>
<tr>
<td>Most Extreme Absolute Differences Positive</td>
<td>0.059</td>
<td>0.045</td>
</tr>
<tr>
<td>Test Statistic</td>
<td>0.059</td>
<td>0.061</td>
</tr>
<tr>
<td>Asymp. Sig (2-tailed)</td>
<td>0.200</td>
<td>0.200</td>
</tr>
</tbody>
</table>

Source: Processed data, 2021

The table above shows the results of the normality test after data outliers and data transformation were carried out. It can be seen that the significance value (Asymp. Sig) of the two variables is 0.200. Since the significance value is higher than 0.05, this means that the data in this analysis are normally distributed.
5.1.2 Linearity Test

Table 2
The results of the linearity test

| Source: Processed data, 2021 |

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nilai Perusahaan * Modal Intelektual Between Groups (Combined)</td>
<td>30.783</td>
<td>85</td>
<td>0.362</td>
<td>1.712</td>
<td>0.052</td>
</tr>
<tr>
<td>Linerity</td>
<td>4.458</td>
<td>1</td>
<td>4.458</td>
<td>21.08</td>
<td>0.000</td>
</tr>
<tr>
<td>Deviation from Linerity</td>
<td>26.324</td>
<td>84</td>
<td>0.313</td>
<td>1.482</td>
<td>0.117</td>
</tr>
<tr>
<td>Within Groups</td>
<td>6.133</td>
<td>29</td>
<td>0.211</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>36.916</td>
<td>114</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table above indicates that the significance value of Deviation from linearity is 0.117, meaning that the significance value of Deviation from linearity is greater than 0.05, showing that the results in this study have a significant linear relationship between the independent and dependent variables.

5.1.3 Heteroscedasticity Test

Picture 1
The results of the heteroscedasticity test

Source: Processed data, 2021
The above image indicates that the data points are dispersed and do not form a pattern, implying that the data in this study does not have heteroscedasticity issues.

5.1.4 Autocorrelation Test

Table 3
The results of the autocorrelation test

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>STd.Error of the Estimate</th>
<th>Durbin-Watson</th>
<th>dU</th>
<th>4-dU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.348</td>
<td>0.121</td>
<td>0.113</td>
<td>0.53594</td>
<td>1.717</td>
<td>1.713</td>
<td>2.287</td>
</tr>
</tbody>
</table>

Source: Processed data, 2021

The Durbin-Watson test was used to conduct the autocorrelation test in this analysis. The "Modal Summary" performance shows a Durbin Watson (DW) value of 1.717, a dU value of 1.713, and a 4-dU value of 2.287. This demonstrates that the DW value is between dW and 4-dU, indicating that the data in this study does not have an autocorrelation problem.

5.2 Simple Linear Regression Test Results

Table 4
Simple Linear Regression Test Results

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>( Constant )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>0.168</td>
<td>0.191</td>
<td>0.882</td>
<td>0.380</td>
<td></td>
</tr>
<tr>
<td>Modal Intelektual</td>
<td>0.310</td>
<td>0.079</td>
<td>0.348</td>
<td>3.94</td>
</tr>
</tbody>
</table>

Source: Processed data, 2021

The linear regression equation is derived from the results of the basic linear regression equations described above:

\[ Y = 0.168 + 0.310 X \]

The constant value in this equation is 0.168, indicating that if the value of intellectual capital is fixed or does not change (has zero value), the company value will be 0.168. Furthermore, it is understood that intellectual capital has a regression coefficient of 0.310, implying that any gain in the intellectual capital of one increases the company's value by 0.310.

5.3 Hypothesis Testing Results
5.3.1 Determination Coefficient Test (R²)
Table 5
The results of the Determination Coefficient Test ($R^2$)

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.348</td>
<td>0.121</td>
<td>0.113</td>
<td>0.53594</td>
</tr>
</tbody>
</table>

Source: Processed data, 2021

The R Square value is 0.121, as seen in the table above. It can be stated that the independent variable, namely intellectual capital, can explain 12.1 percent of the dependent variable, firm value, while the remaining 87.9 percent is explained by other variables not observed in this analysis.

5.3.2 T-Test Statistic
In this statistical test, the following hypothesis is formulated:

$H_0$: Intellectual capital does not affect firm value

$H_a$: Intellectual capital affects firm value

Table 6
The results of the t-test statistic

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>t tabel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>( Constant )</td>
<td>0.168</td>
<td>0.191</td>
<td>0.882</td>
<td>0.380</td>
</tr>
<tr>
<td></td>
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<td>0.079</td>
<td>0.348</td>
<td>3.94</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.981</td>
</tr>
</tbody>
</table>

Source: Processed data, 2021

There are criteria for determining the results of the t-test statistic, namely whether the t-count value is greater than the t-table and whether human capital influences firm value. Intellectual capital has little impact on firm value if the value of t count is less than the value of the t table. The t-count value is 3.940, the t-table value is 1.981, and the regression coefficient value is 0.310, according to the t-test statistic results table above.

6. Discussion
These results show that the t-count value is higher than the t-table value, indicating that $H_1$, namely human capital, has a favorable effect on firm value as measured by the price to book value (PBV). The findings of this analysis are consistent with the findings of (Putra, 2012) and (Indrajaya, 2015) studies, which show that intellectual capital affects firm worth as calculated by
the price to book value ratio (PBV). The study's findings show that human capital that is handled successfully and efficiently will maximize the company's added value. This is because improving the management of each component of intellectual capital will provide positive results for the company. Improved intellectual capital management can increase innovation and the ability of companies to use industrial technologies that are growing rapidly. This can improve product quality and consumer loyalty and increase the company's competitive advantage compared to competing companies. This adds value to the business and allows it to draw the attention of buyers interested in investing. In other words, the potential of high intellectual capital will boost the company's profitability and efficiency, thus increasing investors' interest and perception of the firm. Along with the increase in investor confidence, the company value will also increase, which is indicated by the higher investment made by investors.

According to the Resource-Based Theory, organizations that can handle capital easily and efficiently can generate profit for the organization. Human capital, structural capital, and consumer capital are the commodities in doubt in this situation. High intellectual capital will boost a company's competitive edge, allowing it to succeed and prosper in a volatile market climate. This can increase the attention and interest of investors in investing so that the company value can increase. In other words, investors have considered the effect of intellectual property owned by the company in appreciating the company's market worth.

7. Conclusion
The results of analyzing 186 samples using simple linear regression analysis indicate that intellectual capital affects firm worth as calculated by price to book value (PBV), this indicates that intellectual capital is an added value that can be used in achieving competitive advantage and increase the market perception of the company.

8. Limitation and Suggestion
The limitation in this study is that it uses 3 types of industry in the category of manufacturing companies without distinguishing them so that extreme values appear in the research data which are thought to come from different types of industries. Given the limitations they have, further researchers should use a similar type of industry so that it can reduce extreme values in research data and can show more precise results.

References


