

# Intellectual Capital's contribution to increasing competitive advantage

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**Abstract:** Intellectual capital is an intangible asset that may provide the company with a competitive advantage. Intellectual capital is difficult to understand, but if it is discovered and explored and developed it will be beneficial to be able to compete in its industry. The paper seeks to estimate and analyze the intellectual capital factor, which consists of value-added capital coefficient, human capital, and structural capital toward competitive advantage.

The design of this research is explanatory causal. Population in this study are mining companies on the Indonesia Stock Exchange in 2016 to 2018. The sampling technique of this study was saturated sampling with a total of 223 data. Data analysis techniques using multiple linear regression.

The results of the study explained that the coefficients of value-added capital, human capital, and structural capital simultaneously influence competitive advantage. Partially the coefficient of added value of capital and structural capital has a positive effect on competitive advantage. However, human capital does not affect competitive advantage. The results of this research are in accordance with resource-based theory in which intellectual capital is able to act as a unique resource to create competitive advantage for companies because it is able to provide added value to the company.

**Keyword:** Intellectual Capital, Value Added Capital Coefficient, Human Capital, Structural Capital, Competitive Advantage.

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## I. INTRODUCTION

Developments in the field of information technology, lifestyle, fierce competition, and the growth of innovation have had a significant impact on business management and competitive strategies. The world of business management has changed from labor-based business to knowledge-based business. One approach used in the assessment and measurement of knowledge assets is Intellectual Capital (IC). Noorina (2014)[1] explained that IC has the potential to advance the organization and society because it is related to the knowledge and experience as well as the technology used. Real forms of IC include science and technology, design and implementation of new systems or processes, licenses, intellectual property rights, knowledge of markets and trademarks, computer software, patents, copyrights, motion picture films, customer lists, forest tenure rights, import and export quotas, franchises, relationships with suppliers or customers, customer loyalty, marketing rights, and market share (Saudi, 2018).

IC is a positive interaction between employee competencies, the internal structure of the organization, and external or market relations. Competitive advantage is one of the important variables in dealing with business competition. Resources must have four attributes to produce potential competitive advantages, including: valuable by exploiting opportunities or threats of penetration, rarely among potential competitors and currently, cannot be replicated perfectly and there is no equal substitute for resources (Wernerfelt: 1984, Rumelt: 1984, Barney: 2001)[2]. When a company has a qualified IC, it will create value compared to competitors, so that it will create competitive advantage (Chen et al: 2005, Erik et al: 2013)[3]. Competitive efforts implemented in financial accounting data are important information signals for analysis, forecasting, and market valuation. Victoria and Gregory

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(2008)[4] explain that competitive advantage which includes innovation, capital intensity, market share and financial leverage can increase company value.

## II. LITERATURE REVIEW

### A. Intellectual Capital

Stewart (1997)[5] defines intellectual capital as all the knowledge of employees, organizations and their ability to create added value and lead to sustainable competitive advantage. Putra (2012)[6] quoted from Bontis explains that intellectual capital is identified as a set of intangible assets (resources, abilities, and competencies) that drive organizational performance and value creation. Components of Intellectual Capital (Stewart, 1997)[7], namely:

### B. Human Capital

Human Capital is a person's knowledge, skills and abilities that can be used to produce professional services and economic rent. The human capital formula is as follows:

$$VAHU = VA/HC$$

where:

$$\text{Value added (VA)} = \text{Output} - \text{Input}$$

$$\text{Output (OUT)} = \text{Net interest income} + \text{Total other operating income}$$

$$\text{Input (IN)} = \text{Other total operating expenses} - \text{Personnel Expenses}$$

$$\text{Human Capital (HC)} = \text{Personnel Expenses}$$

### C. Structural Capital

The reason for managing structural capital is the growth and development of science, to shorten the time of a job, and to increase productive people. The structural capital formula is:

$$STVA = SC/VA$$

where:

$$\text{Structural capital (SC)} = \text{VA} - \text{HC}$$

$$\text{Value added (VA)} = \text{Output} - \text{Input}$$

$$\text{Output (OUT)} = \text{Net interest income} + \text{Total other operating income}$$

$$\text{Input (IN)} = \text{Other total operating expenses} - \text{Personnel Expenses}$$

$$\text{Human capital (HC)} = \text{Personnel Expenses}$$

### D. Value Added Capital Coefficient (VACA)

VACA is a comparison between value added (VA) and capital employed (CE) or physical working capital. This ratio indicates the contribution made by each unit of employed capital to the organization's added value. VACA is an indicator of a company's intellectual ability to make better use of physical capital:

$$VACA = VA/CE$$

where :

$$\text{Output (OUT)} = \text{Net interest income} + \text{Total other operating income}$$

$$\text{Input (IN)} = \text{Other total operating expenses} - \text{Personnel Expenses}$$

$$\text{Capital employed (CE)} = \text{Total assets} - \text{Current liabilities}$$

### E. Competitive Advantage

Day and Wensley in Giyarti (2012)[8] suggested that competitive advantage should be seen as a dynamic process rather than as an end result.

Competitive Advantage Measurement:

- Economies of scale.

Economies of scale capture the capability of resources that use technology and manufacturing quality to transform raw materials into final products. The profitability derived from superior products that produce premium prices or by producing efficiently which minimizes costs while maintaining product performance. Both elements are reflected in the cost of sales (Cost of Sales).

- **Product Differentiation**

Product differentiation is the ability to build a brand identity, which is an obstacle for new entrants or existing competitors. Operational profitability is positively related to product differentiation (Caves and Porter: 1977; Mueller: 1986)[9]. In this case operational profitability can be formulated with Return on Assets.

- **Innovation**

Companies that invest more in innovation consisting of research and development as well as patents will have higher future profitability if the projects carried out generate net present value. Innovation is a technology that is owned and measured as the sum of research and development costs and the amortization cost of a patent divided by net sales.

- **Capital Requirements**

If a high level of capital is needed in order to compete in industry, barriers to entry must exist. This study uses the Capital Requirements model from Maury (2018)[10], which uses capital expenditure as a proxy for capital requirements measured as depreciation costs divided by net sales.

*F.* **Earning Persistence**

According to Sloan (1996) in Herbowo (2012)[11] earnings persistence is a measure that explains the company's ability to maintain the amount of profits earned today for a future period. For predictions to be accurate, investors need quality earnings to ensure that earnings information is useful.

$$E_{j,t} = 0_{j,t} + 1_{j,t}E_{j,t-1} + j_{j,t}$$

Where :

$E_{j,t}$  = net income before extraordinary items tahun t

$E_{j,t-1}$  = net income before extraordinary items tahun t-1

*G.* **Return Saham**

Return on investment is usually expressed as an annual return percentage rate. Stock return is the level of profit that will be obtained by investors who invest their funds in the capital market. In this research, stock returns calculated are stock returns from capital gains without calculating the dividend yield.

## **RESEARCH METHODS**

*H.* **Research Design**

The design of this study uses a causal explanatory design or cause and effect that describes a path analysis model that contains various causal relationships. This model bases itself on the causality approach, which aims to see the effect of intellectual capital variables on the variable competitive advantage and then look at the effect of competitive advantage on company performance.

*I.* **Population, Samples, and Sample techniques**

The population in this study are companies included in the mining industry on the Indonesia Stock Exchange (IDX) in 2016-2018. The number of these companies is 41 companies. The total population in this study is 123 data. After determining the population in this study, then the number of samples determined by 123 data. The sampling technique used in this study is the saturation sampling technique, which is a sampling technique where the number of samples in the study is equal to the population.

*C.* **Data Analyzing**

1. Quantitative descriptive statistics, using mean ( $\mu$ ) is a group explanation technique based on the average value of the group.
2. Classic assumption test, including normality using the Kolmogorov-Smirnov test, multicollinearity test, autocorrelation test, and heteroscedasticity test
3. Hypothesis testing with multiple linear regression analysis

The equation model obtained is

$$CA = \alpha_0 + \beta_1 VACA + \beta_2 VAHU + \beta_3 STVA + e$$

where :

CA : Competitive Advantage

$\alpha_0$  : constant

$\beta_1 - \beta_3$  : Regression coefficient

e : Standard error

VACA : Value Added Capital

VAHU : Value Added Human Capital

STVA : Structural Capital

### III. RESULT

The population taken for research is mining companies listed on the Indonesian stock exchange as many as 41 companies. The number of samples in this study were 123 companies, so the total amount of data used was 123 data.

#### J. Quantitative descriptive statistics

Table 1 Descriptive Statistic

Variables	Min	Maximum	Mean
VACA	0.00	6.26	.4287
VAHU	-579.47	1554336.67	16377.2620
STVA	-.59	3.56	.7869
CA	-6.85	139.69	1.3321

Table 1 above shows that the Value Added Capital Coefficient (VACA) measured based on the average score. This figure shows that the contribution made by each unit of employed capital to the organization's added value or the company's intellectual ability to utilize physical capital is 0.4238. This means that the average human resources working in the mining industry have sufficient ability to utilize their physical capital. Value Added Human Capital (VAHU) shows that the combination of knowledge, skills, innovativeness, and the ability of individuals in a company to carry out their duties in creating a value is 16,377.2620. This means that the average human resources working in the mining industry have been able to use their knowledge, expertise, innovation and ability to provide added value to the company. STVA shows that the ability of the organization includes infrastructure, information systems, routines, procedures and organizational culture that supports the efforts of employees to produce optimal intellectuals. is 0.7869. This means that assets owned by the company in the mining industry have on average been able to employ employees to add value to the company. The competitive advantage measured by the ROA of each company compared to the industry average presented in the table above is equal to 44 data showing the ROA obtained is greater than the average industry ROA, and as many as 79 data shows the ROA obtained is smaller than the industry average ROA. This figure shows the level of competitive advantage of the company is still low compared to the industry.

#### K. Classic Assumption Test

Table 2 Test requirements analysis

classic assumption	formula	result
normality	asymptotic	> 0.05
multicollinearity	vif	< 10
Heteroscedasticity	scatter plot	spread

Autocorrelation                      Durbin-Watson                      1.7559 < 2.099 < 2.2441

Based on the results of the normality test data after the transformation of this research data assumes the normality of the data, there is no multicollinearity, no clear patterns and points spread either above or below zero on the Y axis, which means there is no heteroskedasticity, no autocorrelation.

C. Hypothesis Testing

This test is used to determine whether there is a simultaneous and partial effect between VACA, VAHU and STVA on Competitive Advantage. The F Test results can be seen as follows:

Tabel 3 Result of F and t Test

Test	Variable	Coefficient	Significance
F		9.44	.00
t-test	vaca	0.74	.00
t-test	ihu	0.00	.58
t-test	stva	1.97	.01
Constant		4.10	.00

1. F Test

Then Ha1 accepted. Based on the test results as shown in table 5.5 simultaneously found that the significance value of 0.00 < 0.05, meaning that the intellectual capital variable which is proxied by VACA, VAHU and STVA affects the Competitive Advantage. Competitive advantage in this study is proxied by the company's Return On Assets compared to the average industry average Return On Assets as a measure of the company's success in competing in its industry. This ratio illustrates product differentiation which is the ability to build a brand identity that is an obstacle for new entrants or existing competitors. Operational profitability is positively related to product differentiation (Caves and Porter: 1977; Mueller: 1986)[12].

2. t Test

Then Ha2 is accepted, from table 3 above the test results of the influence of Value Added Capital Employed (VACA) on Competitive Advantage obtained evidence that a significance value of 0,000 < α (0.05) means Value Added Capital Employed (VACA) has a significant effect on Competitive Advantage.

Value added capital employed (VACA) shows the company's ability to manage resources in the form of capital assets which, if managed properly, will improve the company's financial performance. When capital is used by companies in relatively large amounts so that the income of any company will also increase. VACA is also an indicator for Value Added created by a unit of physical capital. In resource based theory, it is stated that the intellectual capital owned by the company will be able to create a competitive advantage in the company so that it can improve the company's financial performance for the better, one of which is proven by increasing the company's profit.

Furthermore Ha3 was rejected, from table 3 above the results of testing the effect of Value Added Human Capital (VAHU) on Competitive Advantage obtained evidence that a significance value of 0.575 > α (0.05) means Value Added Human Capital (VAHU) had no significant effect on Competitive Advantage.

Value Added Human Capital (VAHU) shows how much added value can be generated with funds spent on labor. Mining, oil and gas companies are sectors that are known as capital intensive sectors. This capital is mainly used for the purposes of purchasing land or concession areas, obtaining mining permits, procuring expensive heavy equipment, and exploration and extraction costs before the actual benefits can be absorbed by the business owner. The mining industry is a capital-intensive industry related to

businesses that require large investments to buy expensive assets such as land, factory machinery, vehicles, equipment, facilities, and other infrastructure. Therefore, the production process is very dependent on the use of machines rather than the use of labor or human resources. The mining industry is known to have unique and different characteristics compared to other industries. The mining industry is generally a long-term and capital-intensive investment (Setiawan)[13]. This is thought to be the reason why human capital or labor owned by mining companies do not contribute to increasing competitive advantage for their companies.

While Ha4 is accepted, from table 3 above the results of testing the effect of Value Added Structural Capital (STVA) on Competitive Advantage obtained evidence that a significance value of  $0.001 < \alpha (0.05)$  means Value Added Structural Capital (STVA) has a significant effect on Competitive Advantage. Value Added Structural Capital (STVA) is the ability of an organization or company to meet the company's routine processes and structures that support the efforts of employees to produce optimal intellectual performance and overall business performance, for example: company operational systems, manufacturing processes, organizational culture, management philosophy and all forms of intellectual property owned by the company (Sawarjuwono, 2003)[14]. Companies with strong structural capital will provide cultural support that allows companies to try and learn. With the higher STVA, it can be explained that the company is able to manage its structural capital properly and which subsequently impacts on an efficient production process and reduces unused production costs thereby increasing company profits. Thus efficiency will have a good competitive ability so STVA will increase competitive advantage.

#### D. Regression Equation Test

Viewed from table 3 a regression equation can be made. From this analysis the results of the regression equation are obtained as follows:

$$CA = -4.100 + 0,375VACA + 0,0000006VAHU + 0,1968STVA + e$$

A constant of -4,100 states that if the independent variable = 0, the Competitive Advantage is -4,100. The constant number also represents other variables not examined, meaning that if there is no VACA, VAHU and STVA, the Competitive Advantage value will be -4,100. Regression coefficient of VACA (X1) of 0.375 states that each increase of 1 VACA will cause an increase in Competitive Advantage of 0.375. VAHU regression coefficient (X2) of 0.0000006 states that each increase of 1 VAHU will cause an increase in Competitive Advantage of 0.000006. STVA regression coefficient of 0.1968 states that each increase of 1 STVA will cause an increase in Competitive Advantage of 0.1968.

#### IV. IMPLICATIONS, LIMITATIONS AND SUGGESTIONS

The results of this study are supported by Resources Based Theory which states that intellectual capital meets the criteria as a unique resource to create competitive advantage for companies so as to get value added for the company (Kuspinta and Husaini, 2018)[15]. With the use of intellectual capital, it is expected that the company must be able to process and maximize the use of its resources efficiently and effectively which can increase company profits, so that the company can better utilize its intellectual capital so that the company can increase the level of profitability of the company and the level of investor confidence. Companies that are able to manage IC well will greatly affect the competitive advantage of the company. This will encourage companies to continue to develop resources in the form of ICs to be able to excel in industrial competition thereby increasing company performance.

Limitations in this research are competitive advantage measurement tools that cannot be measured by all proxies, so they are only measured by comparison of company and industry ROA. Suggestions for further research is to measure the impact of IC on performance in the capital market, so that it can be seen the role of IC in improving the company's market performance.

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