

# Influence of Intellectual Capital on Company Performance of Banks and Insurance Companies in Indonesian Stock Exchange 2010-2014

I.K. Marla Lusda

Graduate School of Management and Business, Bogor Agricultural University, 16680, Bogor, West Java, Indonesia

Hari Wijayanto

Department of Statistics, Faculty of Mathematics and Sciences, Bogor Agricultural University, 16680, Bogor, West Java, Indonesia

Dedi Budiman Hakim

Department of Economics, Faculty of Economics and Management, Bogor Agricultural University, 16680, Bogor, West Java, Indonesia

## Abstract

The phenomenon of intellectual capital has grown after the change of economic characteristics that were previously based on labor into a knowledge-based economy. This study aimed to analyze the company's intellectual capital in the banks and insurance companies. The effect of intellectual capital on the financial performance of companies was tested using panel data for companies listed in the Indonesian Stock Exchange (BEI) 2010-2014. The selection for sample used purposive sampling method. This study used a model of Value Added Intellectual Coefficients (VAIC) to measure intellectual capital. Ratio analysis used to measure the financial performance. Return on Assets (ROA) used as profitability variable and Assets Turn Over (ATO) used as productivity variable. The results of this study indicated that the contribution of intellectual capital depended on the type of industry.

**Keywords:** intellectual capital, VAIC, financial sector, Indonesian stock exchange

## 1. Introduction

The evolution in information, technology, and science has sparked growing concern in the management of intangible assets. One of the intangible assets that become focus of attention is the intellectual capital. Intellectual capital (IC) becomes attractive because of its benefits as an instrument for determining the value of the company. According to Sullivan [1], during this time, the management and reporting systems has lost its relevance because it is not able to present the essential information to manage processes based on knowledge. In his research, Sullivan had found that the reporting system does not provide information about the identification and the measurement of intangible assets in a company. The types of intangible assets such as employee competence, customer relations, simulation models, administration and computer systems as well as proprietary brands and patents are rarely reported in the annual report. The Organization for Economic Cooperation and Development (OECD) agreed that IC is a very important asset for the company to win the competition.

Companies in Indonesia tend to use conventional methods in building the business which is the company's productivity seen from quantity not quality. This causes the products are still poor of technology content. Companies are still not paying attention to human capital, structural capital, and customer capital which is a component of the company's IC. Research about IC becomes interesting because based on a global survey held in 1998, IC disclosure is one of 10 types of information needed by company. Purnomosidhi [2] describes the results of a survey for the types of information that needed by the investor held by Price Waterhouse Coopers (PWC). Based on the survey, there are 10 types of information considered as important information is grouped into three groups, namely customers, employees, and innovation. Information relating to customer components

are distribution channels, brand equity, and customer turnover. Information relating to employee components are the ability of employee and employee's salary. Information relating to innovation components are revenue from new products, the success rate of new products, spending on research and development, as well as the product development cycle. The information that is classified as an IC not disclosed in the annual report causes gaps in information.

Sangkala [3] describes the IC is not only related to intellectual material contained in the employee such as education and experience. IC is also associated with company's assets based on knowledge or the process of transformation of knowledge to intangible intellectual assets of companies, such as information, intellectual property, customer loyalty, patent, trademark, brand equity, and database. Chen et al. [4] states that the IC is increasingly recognized as an important strategic asset for the company's competitive advantage. IC is believed to play an important role in improving the profitability of the company. Based on the resource-based theory, using company resources efficiently and economically can reduce costs. IC can improve the use of existing resources efficiently, so as to minimize costs and optimize profitability. Companies that can manage the employee's potential can increase employee productivity. If employee productivity increases, so does the revenue and profits. The increase in company's revenue and profit shows the company's financial performance increase as well. On the issues that have been raised previously, the purpose of this study is analyzing the effect of intellectual capital on firm performance of banks and insurance companies.

## 2. Literature Review

Intellectual capital (IC) can be defined as the sum of the thing that is produced by the three components of the organization (human capital, structural capital, customer capital) related to the knowledge and technology to provide more value for the company as competitive advantage. IC consists of the interaction between three components such as human capital, structural capital, and customer capital. Human capital reflects the company's collective ability to produce the best solution based on the knowledge possessed by the people in the company. Structural capital is the ability of an organization or company to fulfill the company's structure that supports employee efforts to produce the optimal intellectual performance and business performance, such as company's operational systems, manufacturing processes, organizational culture, management philosophy and all forms of company's intellectual property (Brinker) [5]. Capital customer is a company's relationship or network with their partners, such as comes from reliable suppliers, from loyal and satisfied customers, and from the company's relationship with the government and surrounding society (Suwarjuwono) [6].

Value Added Intellectual Coefficient (VAIC) method developed by Pulic [7], to provide the information about the value creation efficiency of tangible assets and intangible assets owned by the company. VAIC is an instrument that used to measure the intellectual capital of the company. This approach is relatively easy and it is possible to do because it is constructed from the accounts in annual report such as balance sheets and balance of profit and loss.

## 3. Research Methodology

### 3.1 Data

The data used in this study were secondary data from company's annual report 2010 until 2014. The company used in this study is in the financial sector, especially bank and insurance companies listed in Indonesian Stock Exchange. Annual report used in this study was obtained through the official website of each company and the IDX website. Data companies used as sample in this research can be seen in Table 1.

**Table 1. Companies used as sample in this research**

Sub Sector	Number of companies	The number of available companies	Period of observations
Bank	41	30	5 years
Insurance	11	10	5 years
Total	52	40	

Source: IDX 2010

### 3.2 Methods of Analysis and Data Processing

Intellectual capital is a combination of the value added created by physical capital (VACA), human capital (VAHU), and structural capital (STVA) where this value will be measured by the Value Added Intellectual Coefficient (VAIC). VAIC calculation consists of five stages:

- Calculating the Value Added (VA)

VA calculated as the difference between output and input. VA also can be calculated from the accounts of companies that exist in the annual report.

$$VA = OUT - IN$$

Where:

OUT (output) : income of operational and profit of operational.

IN (input) : costs of operational except personnel expenses (expenses of operational, depreciation, and amortization)

- Calculating the Value Added of Capital Employed (VACA)

VACA is an indicator for VA which is created by one unit of physical capital. This value shows the contribution made by each unit of the capital employee to company's value added.

$$VACA = \frac{VA}{CE}$$

Where:

CE : the available funds for the company (equity and net income).  
( total assets - total liabilities )

- Calculating the Value Added of Human Capital (VAHU)

VAHU shows how much VA can be generated by the funds that spent on labor. This value shows the contribution made by each rupiah that invested in HC against the value added of the company.

$$VAHU = \frac{VA}{HC}$$

Where:

HC : personnel expenses

- Calculating Value Added of Structural Capital (STVA)

This value measures the amount of structural capital (SC) required to produce a one rupiah from VA and is an indication of how the success of the SC in value creation.

$$STVA = \frac{SC}{VA}$$

Where:

SC : VA - HC

- Calculating the Value Added Intellectual Coefficient (VAIC)

VAIC indicates the company's intellectual capabilities are built from components VACA, VAHU, and STVA.

$$VAIC = VACA + VAHU + STVA$$

Financial performance variable used in this study are profitability and productivity. ROA used to represent the profitability of the company. ATO used to represent the productivity of the company.

- Return on Assets (ROA) reflect the company's profit and efficiency in utilizing all resources or assets owned by the company. [4]

$$ROA = \frac{\text{Net Profit}}{\text{Total Assets}}$$

- ATO is the ratio of total revenue to book value of total assets (Firer). [8]

$$ATO = \frac{\text{Total Revenue}}{\text{Total Aset}}$$

### 3.3. Research Model

The first hypothesis shows the relationship of IC and profitability in the company's financial performance. Based on RBT, the use of company's resources efficiently and economically can reduce costs. The higher the IC, the profit will increase, resulting in increased value of ROA.

H<sub>1a</sub> : Intellectual Capital (physical capital) affects the company's profitability

H<sub>1b</sub> : Intellectual Capital (human capital) affects the company's profitability

H<sub>1c</sub> : Intellectual Capital (structural capital) affects the company's profitability

Model equation of this hypothesis is:

$$ROA_{it} = \alpha_0 + \beta_1 VACA_{it} + \beta_2 VAHU_{it} + \beta_3 STVA_{it} + \varepsilon_{it} \dots (H_1)$$

i : cross section ; t : time series

The second hypothesis shows the relationship of IC and productivity in the company's financial performance. Based on RBT, the value of company's IC can create added value that provides a competitive advantage and increase productivity. The increasing of company's productivity influence the stakeholder's trust to increase.

H<sub>2a</sub> : Intellectual Capital (physical capital) affects the company's productivity

H<sub>2b</sub> : Intellectual Capital (human capital) affects the company's productivity

H<sub>2c</sub> : Intellectual Capital (structural capital) affects the company's productivity

Model equation of this hypothesis is:

$$ATO_{it} = \alpha_1 + \gamma_1 VACA_{it} + \gamma_2 VAHU_{it} + \gamma_3 STVA_{it} + \varepsilon_{it} \dots (H_2)$$

i : cross section; t : time series

## 4. Result and Discussion

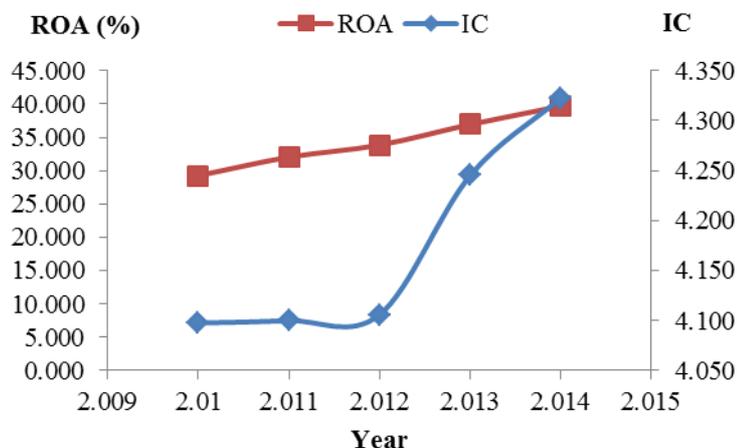
### 4.1. Banking sub sector

The test results in Table 2 shows an increase in the value of the IC on the banking sector from 2010 to 2014. Tests conducted on the ROA and ATO has also increased every year.

**Table 2. The relationship between intellectual capital and company performance in the banking sub-sector 2010 - 2014**

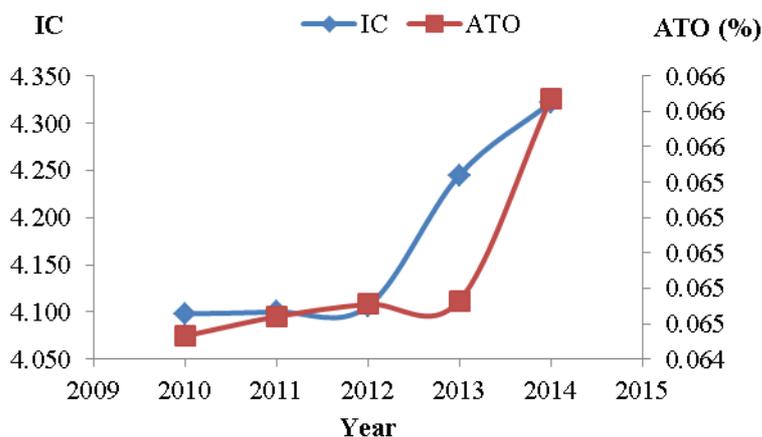
Year	IC	ROA	ATO
2010	4.098	29.251	0.06454
2011	4.100	32.033	0.06464
2012	4.106	33.845	0.06472
2013	4.245	36.935	0.06474
2014	4.323	39.687	0.06587

The relationship between IC and ROA in banking sub sector is shown in Figure 2. The figure shows an increase in the value of IC followed by an increase in ROA. This means there is a positive relationship between the IC and the company's performance. When the value of IC has increased, the performance of the companies represented by ROA also increased.



**Figure 1. The relationship between intellectual capital and ROA in the banking sub-sector**

The relationship between IC and ATO in banking sub sector is shown in Figure 3. The figure shows an increase in the value of IC followed by an increase in ATO. This means there is a positive relationship between the IC with the company's performance. When the value of IC has increased, the performance of the companies represented by the ATO also increased.



**Figure 2. The relationship between intellectual capital and ATO in the banking sub-sector**

The components of IC that affect the performance of the banking sub sector company can be seen through F test and t test on each variable. The test results are shown in Table 3.

**Table 3. The influence of IC on the financial performance company of the banking sub sector**

	Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	C	0.346	0.164	2.11	0.036
	VACA	0.220*	0.058	3.793	0.000
	VAHU	0.009	0.011	0.818	0.429
	STVA	-0.008	0.011	-0.727	0.481
	R square	: 0.111			
	F-statistic	: 6.107			
	F table	: 2.67			
Prob (F statistic) : 0.000					
ATO	C	0.051	0.004	12.75	0.000
	VACA	0.019*	0.003	6.333	0.000
	VAHU	0.002*	0.001	2	0.002
	STVA	-0.000	0.000	0	0.829
	R square	: 0.261			
	F-statistic	: 17.155			
	F table	: 2.67			
Prob (F statistic) : 0.000					

Notes: \* significant at level 5%

From these results, the equations are as follow:

$$ROA_{it} = \alpha_0 + \beta_1 VACA_{it} + \beta_2 VAHU_{it} + \beta_3 STVA_{it} + \varepsilon_{it} \dots (H_1 \text{ bank})$$

$$ROA = 0.346 + 0.22 + 0.009 - 0.008 + e$$

$$ATO_{it} = \alpha_1 + \gamma_1 VACA_{it} + \gamma_2 VAHU_{it} + \gamma_3 STVA_{it} + \varepsilon_{it} \dots (H_2 \text{ bank})$$

$$ATO = 0.051 + 0.019 + 0.002 - 0 + e$$

:

The constant of ROA is 0.346 means that when the IC component such as VACA, VAHU, and STVA does not affect the ROA, then the value of ROA in the banking sub-sector amounted to 0.346. The constant of ATO is 0.051 means that when the IC component does not affect the ATO, then the value of ATO in the company amounted to 0.051. The coefficient of VACA means that the increase of one percent capital employed disclosure can improve amounted to 0.220 % of ROA and 0.019 % of ATO. The coefficient of VAHU indicates that the increase of one percent human capital disclosure can increase amounted to 0.009 % of ROA and 0.002 % of ATO. The coefficient of STVA indicates that the increase of one percent of structural capital disclosure can lower amounted to 0.008 % of ROA.

It can be seen from Table 3 that F test results showed IC affects ROA and ATO in the company from banking sub sector. T test results showed VACA and VAHU effect on ROA and ATO, while STVA not affect to the company's ROA and ATO. The test results of determination coefficient indicates the magnitude of the effect of IC on ROA companies is 11.15 % and the other 88.85 % were influenced by other variables that is not examined in this study, while the influence of IC against ATO company is 26.1 % and the other 73.9 % were influenced by other variables that is not examined in this research.

The results showed that the capital employed as a component of intellectual capital that affect financial performance. This result is equal to Maditinos et al. [9]. The developing countries are more likely to appreciate the company's capital employed compared to other components of IC. In addition, the differences in the development and using of technology could also lead to the differences in the implications of IC. Based on the RBT, resources that used efficiently is the main cause for competitive advantages that enhance the performance of the company. In a competition, the company which has more advantages than other, will get more consumers. The number of customers that company gain will lead the company's revenue to be increased. Because of that, the capital employed of the company should be has high value.

The insignificant value of VAHU indicates that the personnel expenses incurred by the banking company for investment in human resources is not comparable with the added value acquired by company. One of the reason could be due to payroll costs that are too high and are not accompanied by the increase of financial performance significantly or the lack of effective training programs that company held. The insignificant value of STVA indicates that the company's speed of response in creating added value tends to be too slow. Company's speed of

response can be determined by the systems, procedures, and bureaucracy within the company.

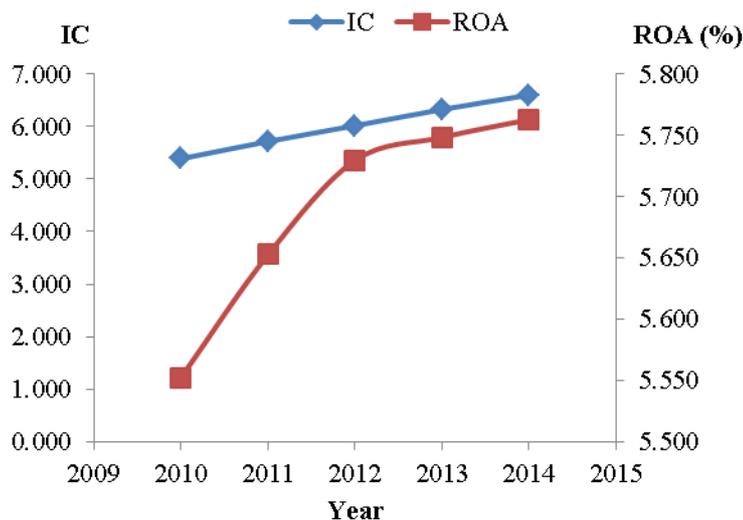
#### 4.1. Insurance sub sector

The test results in Table 4 shows that there is no correlation between the value of the IC with the financial performance of companies in the insurance sub-sector from 2010 to 2014. The value of IC in the insurance sub-sector have increased, but not inconsistent with the company's financial performance variables, where ROA increased, while ATO has decreased.

**Table 4. The relationship between intellectual capital and company performance in the insurance sub-sector 2010 - 2014**

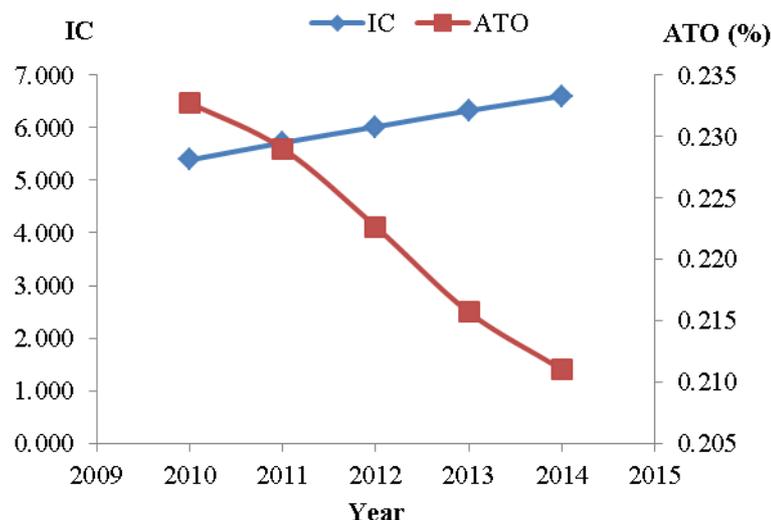
Year	IC	ROA	ATO
2010	5.388	5.552	0.233
2011	5.717	5.653	0.229
2012	6.018	5.730	0.223
2013	6.325	5.748	0.216
2014	6.601	5.763	0.211

The graph of IC and ROA of the insurance companies is shown in Figure 4. The figure shows that the value of IC has increased, so did the ROA. But each graph does not have a relationship because they do not intersect. This means there is no relationship between the IC with the company's performance.



**Figure 1. The relationship between intellectual capital and ROA in the insurance sub-sector**

The graph of the relationship between ATO and IC for insurance sub-sector is shown in Figure 5. The figure shows that the value of IC has increased, but the value of ATO has decreased. This means that there is a negative correlation between the IC with the company's performance. When the IC has increased, the performance of the companies that represented by ATO has decreased.



**Figure 2. The relationship between intellectual capital and ATO in the insurance sub-sector**

The components of IC that affect the performance of the insurance sub sector company can be seen through F test and t test on each variable. The test results are shown in Table 5.

**Table 5. The influence of IC on the financial performance company of the insurance sub sector**

	Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	C	4.162	1.190	3.497	0.001
	VACA	3.795	2.022	1.877	0.066
	VAHU	0.108	0.072	1.497	0.141
	STVA	-0.556	0.441	-1.260	0.213
	R square	: 0.239			
	F statistic	: 4.819			
	F table	: 2.81			
	Prob (F statistic)	: 0.005			
ATO	C	0.287	0.059	4.812	0.000
	VACA	-0.042	0.096	-0.439	0.662
	VAHU	-0.003	0.003642	-0.882	0.382
	STVA	-0.032	0.020588	-1.544	0.129
	R square	: 0.076			
	F statistic	: 1.254			
	F table	: 2.81			
	Prob (F statistic)	: 0.301			

Notes: \* significant at level 5%

From these results, the equations are as follow:

$$ROA_{it} = \alpha_0 + \beta_1 VACA_{it} + \beta_2 VAHU_{it} + \beta_3 STVA_{it} + \varepsilon_{it} \dots (H_1 \text{ insurance})$$

$$ROA = 4.162 + 3.795 + 0.108 - 0.555 + e$$

$$ATO_{it} = \alpha_1 + \gamma_1 VACA_{it} + \gamma_2 VAHU_{it} + \gamma_3 STVA_{it} + \varepsilon_{it} \dots (H_2 \text{ insurance})$$

$$ATO = 0.287 - 0.042 - 0.003 - 0.032 + e$$

The constant of ROA is 4162. It indicates when VACA, VAHU, and STVA does not affect to ROA, the value of ROA is equal to 4,162. The constant of ATO is 0287 indicates that when the components of IC does not affect to the ATO, then the value of ATO is equal to 0287. The value of VACA implies that the increase of one percent of capital employed disclosure could increase 3,795 % of ROA and decrease amounted to 0.042 % of ATO. The value of VAHU indicates that the increase of one percent of the disclosure of human capital can increase 0108 % of ROA and decrease amount to 0.003 % of ATO. The value of STVA indicates that the increase of one percent

of the structural capital disclosure can lower amounted to 0.555 % of ROA and 0.032 % of ATO.

From Table 5, the F test results showed that VACA, VAHU, and STVA does not affecting ROA and ATO of insurance companies simultaneously. T test results showed that components of IC which is VACA, VAHU, and STVA, has no significant effect on the ROA and ATO of the company. This results obtained the result of Kuryanto's research [10] that the IC has no influence to the company's performance.

The results show that the value of IC is not significant for insurance company. It can be caused by the lack of disclosure of IC in the company's annual report. This is also supported by a statement of Guthrie et al. [11]. The disclosure of IC is not presented much in the figures because the IC is still difficult to quantify. Reporting and disclosing the value of IC in annual report is still optional, so the IC is still not carried out by all companies thoroughly. The disclosure of IC still have not found a specific pattern to expose. Overall, the company emphasize that IC is an important thing that is needed to face the competition, even though the IC itself can not be delivered in the annual report as solid thing. This result is also supported by research Permono [12] which states that Indonesian companies less intensive disclose information of IC.

## 5. Managerial Implications

Based on the results that states VACA has significant influence to the performance of companies dependent on financial capital. The financial capital of banking can be improved by doing business collaboration such as partnership between banking and telecom provider to develop the branchless banking and mobile banking programs. The company also can equalize the distribution network such as development banking branches in remote areas and the development of the franchise feature or service transactions by a third party or agent to facilitate the society in conducting financial transactions.

The influence of VAHU showed that the performance of companies dependent on human resources. The company can improve the human resources by creating tools of increasing competency of banking like Bank Mandiri's program, which is established the Mandiri University to create professional bankers and prevent any gap between the level of competence for the bankers. The increased of human resource competencies can also be done through a certification program. The influence of STVA showed that the performance of companies dependent on structural capital. The company can enhance the structural capital by increasing the information system such as the development of applications content on mobile banking.

## 6. Conclusions and Recommendations

### 6.1. Conclusion

This research shows that intellectual capital affect the performance of the company even though the proportion of the effects is different depending on the type of companies. Managers should improve the efficiency of components of IC such as the financial capital management, employee competency, and efficiency in operational processes of the company. It has proved that there is a positive relationship between VACA VAHU and STVA to company performance such as ROA and ATO. Intellectual capital and company's performance have direct relationship. It means that the higher value of the intellectual capital in the company can affect its performance to increase. This research successfully supports the stakeholder theory and resource based theory.

### 6.2. Recommendations

This study still has many limitations, such as only using ROA and ATO to measure the company's financial performance. The next research can use other alternative variable that resembles company's financial performance. Associated with the holding of the MEA program, it is good to subsequent further research by expanding the sample observation region to ASEAN countries which can compare the Indonesia's economy with other countries in order to help anticipate damages for Indonesia's contribution in the MEA. The subsequent research can also extend the sample to some other different industrial sectors because MEA is not only about financial sector but also more wide range of other industries. Subsequent research could also use the intellectual capital calculation methods other than the VAIC method.

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