jkp
Jurnal Keuangan dan Perbankan
UNIVERSITY OF MERDEKA MALANG

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Relationship between Intellectual Capital with Profitability and Productivity in Indonesian Banking Industry

Abstract

This study aims to examine the impact of intellectual capital (VACA, VAHU, STVA) on profitability and productivity. The population in this study is a banking company listed on the Indonesia Stock Exchange from 2014 to 2016. Samples obtained by a purposive sampling method, obtained 30 banking companies from 2014 to 2016. It is an empirical study using PLS for the data analysis. The analysis using outer test models and inner model. Research results show that intellectual capital has positive impact to profitability (ROA). The higher the value of VAIC (Value Added Intellectual Capital), the higher the profitability of the banking company. This indicates that the company is getting better in managing the assets that result in increased return on assets owned companies measured by ROA. Intellectual capital has a positive impact on productivity (ATO), yet VAHU and STVA has no positive and significant effect on productivity, whereas VACA has a positive and significant influence on productivity. Companies have been able to use physical capital to improve the efficiency of the company.

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Abstrak

Penelitian ini bertujuan untuk menguji pengaruh modal intelektual (VACA, VAHU, STVA) terhadap profitabilitas dan produktivitas. Populasi dalam penelitian ini adalah perusahaan perbankan yang terdaftar di Bursa Efek Indonesia dari tahun 2014 sampai 2016. Sampel yang diperoleh dengan metode purposive sampling, *diperoleh 30 perusahaan perbankan dari tahun 2014 sampai 2016. Ini adalah studi empiris menggunakan PLS untuk analisis data. Analisis menggunakan uji* outer model *dan* inner model. *Hasil penelitian menunjukkan bahwa model intelektual berpengaruh positif terhadap profitabilitas (ROA). Semakin tinggi nilai* VAIC (Value Added Intellectual Capital), *semakin tinggi profitabilitas perusahaan perbankan. Hal ini mengindikasikan bahwa perusahaan semakin membaik dalam mengelola aset yang menyebabkan kenaikan pengembalian pada aset perusahaan yang dimiliki yang diukur dengan ROA. Modal Intelektual memiliki dampak positif terhadap produktivitas (ATO), namun VAHU dan STVA tidak berpengaruh positif dan signifikan terhadap produktivitas, sedangkan VACA memiliki pengaruh positif dan signifikan terhadap produktivitas. Perusahaan telah mampu menggunakan modal fisik untuk meningkatkan efisiensi perusahaan.*

Kata Kunci: Modal Intelektual, Profitabilitas, Produktivitas

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Attention to the practice of intangible asset management has increased dramatically since the 1990s. One approach used in the assessment and measurement of intangible asset is Intellectual Capital (IC) which has become the focus of attention in various fields, whether management, information technology, sociology, and accounting (Petty & Guthrie, 2000; Sullivan & Sullivan, 2000).

Globalization, technological innovation, and fierce competition in this century forced companies to change the way they do business. In order to survive, companies change their business from labor-based businesses to knowledge-based businesses, with the main characteristics of science. The existence of science-based knowledge changes and with the application of knowledge management then the prosperity of a company will depend on a creation of transformation and capitalization of knowledge itself.

The emergence of the knowledge driven economy is then presented its own challenges for business people, especially for the management of companies and regulators. For corporate management, intangible asset is one of the key factors that can improve financial performance and create competitive advantage of the company. The problem faced by the management of the company now, that is, there is no instrument that can be used to assess the company's intangible assets comprehensively which ultimately causes the intangible assets cannot be managed properly.

Challenges on the classification, identification, and recording of intangible assets in the financial statements are also experienced by regulators. The current accounting standards are limited to the presentation of knowledge based processes and intangible assets in the company's financial statements because they cannot be measured monetarily (Norita, 2011). The increase in intangible assets through the activities of the company is not recorded as an asset, but will be treated as an expense in the current period.

Research on IC has been done several times. Bontis (1998) states that the IC has an effect on the performance of the company (Malaysia). Syafruddin & Kuryanto (2008) stated that there is no significant influence on IC on the performance of the company conducted on various types of public companies. The financial performance used is return on equity (ROE), earnings per share (EPS), and annual share returns (ASR).

Ulum (2008) conducted research on 30 banking companies with 3 years' observation from 2004-2006. The financial performance used is return os asstes (ROA) profitability, revenue to total asset ratio (ATO), and growth revenue (GR). In the results of his research, Ghozali presents evidence that there is the influence of the IC (VAIC ™) on the financial performance of the company during the 3 years observation year 2004-2006.

IC has a significant effect on profitability (Artinah, 2011; Suhendah, 2012). Suhendah (2012) found that intellectual capital has a significant effect on profitability (positive) and productivity (negative), but no significant effect on market valuation. The study was conducted on companies that went public in Indonesia in 2005-2007. Profitability using ROA, productivity using ATO, and market valuation measured by market capitalization (MB). The analysis was done by multiple regression analysis.

Rachmawati (2012) and Faza & Hidayah (2014) found that intellectual capital positively affects ROA of banking. Rachmawati (2012) conducted research on banking companies registered in Bank Indonesia period 2006-2009. The analysis used a simple linear regression analysis.

The results of Faza & Hidayah (2014) showed that intellectual capital has a positive effect on ROA and ROE, but has no positive effect on ATO and Tobin's Q. Profitability is measured by ROA and ROE, productivity was measured by the ATO, while firm value was measured by Tobin's Q. The object of the study was conducted on 27 banking companies from 2010-2012.

The banking industry in Indonesia is growing steadily. The banking world in recent years should provide new approaches and thinking in managing the business. This can cause problems if companies cannot compete, therefore banks need to find ways to increase productivity and ensure profitability (Latumaerissa, 2011). IC is an important factor to help companies gain competitive advantage.

This study performs statistical tests to examine the effect of VACA, VAHU, and STVA on profitability and firm productivity. This study has the main objective to examine the influence of intellectual capital on the profitability and productivity of banking sector companies listed on the BEI. Due to differences in research results from previous research, this research will be done by adopting a research model of Firer & Williams (2003) and using the adoption of PLS data analysis as did by Ghozali (2006).

The banking sector is chosen as the ideal object of this research because: (1) presented financial report data (balance sheet, profit/loss) of publications that can be accessed at any time; (2) the banking industry is one of the most intensive sectors of its IC (Firer & Williams 2003); and (3) overall employees in the banking sector are "intellectually" more homogeneous compared to other economic sectors (Kubo & Saka, 2002).

The theory underlying this research is a stakeholder theory. Stakeholder theory is more concerned with the position of stakeholders who are considered powerful. Stakeholder theory assumes that the existence of the company is determined by the stakeholders. The company seeks to justify its stakeholders in running its operations. The stronger the position of stakeholders, the greater the tendency of companies to adapt themselves to the desires of its stakeholders. Stakeholder theory also focuses on how an organization can respond, and regulate the interests and needs of its stakeholders. IC has the ability to create value when faced with constant change (Stahle & Hong, 2002).

Bontis, Keow, & Richardson (2000) Shih, Chang, & Lin (2010), and Uzliawati (2015) stated that in general, the researchers identified 3 main constructs of IC, namely human capital (HC), structural capital (SC), and customer capital (CC). HC describes a collection of individual knowledge that exist in an organization that is represented by its employees. HC is a combination of genetic inheritance; education; experience, and attitude about life and business.

Bontis, Keow, & Richardson (2000) states that SC covers all non-human storehouses of knowledge in the organization, including databases, organizational charts, process manuals, strategies, routines, and everything that makes the value of the company greater than the material value. While CC is knowledge inherent in marketing channels and customer relationship that an organization develops through the business.

Komnenic, Tomic, & Pokrajèiæ (2011) argues that the increased efficiency of the use of tangible assets (VACA), human capital (VAHU), and structural capital (STVA) has the potential to increase the level of profitability of the company. Efficient use of assets demonstrates the ability of firms to suppress production cost components to the lowest possible level in order to enable increased profitability. The utilization of human capital efficiently shows an increase in employee productivity in the work so that it can produce the maximum output that impact on increasing profitability of the company. Utilization of structural capital efficiently shows an increase in the company's structural capital capability in providing added value for the company so that it can have an impact on increasing the profitability of the company.

IC has significant effect on profitability, Rachmawati (2012), Dewi & Isynuwardhana (2014), and Faza & Hidayah (2014) found that intellectual capital has a positive effect on ROA to accounting profit and provide added value in improving the company's ROA. Based on the theory, it can be concluded formulated hypothesis as follows:

H_{1a}: VACA has a positive effect on company profitability

H_{1b}: VAHU has a positive effect on company profitability

H_{1c}: STVA has a positive effect on company profitability

Productivity is a measure of the company's effectiveness in using or utilizing all of its resources to generate revenue. The use of IC is one of the strategies that can be applied by companies to increase their productivity. Increased efficiency of VACA shows an increase in the company's ability to increase the level of utility assets owned in the production process. The increased efficiency of VAHU shows an improvement in the performance of company employees towards a more productive level. Improving the efficiency of STVA suggests an increase in the firm's structural advantage that can lead to increased productivity.

Shiri & Mousavi (2015) found that intellectual capital has a significant effect on productivity. IC can be an important tool in decision making for decision makers such as managers, capital market analysts, borrowers, and investors. Productivity can combine the dimensions of efficiency and effectiveness. Productivity must have adequate resources and be used appropriately. In-process activities and resources must have added value in the product/ service generated.

This is different from the research by Suhendah (2012), Faza & Hidayah (2014) found that intellectual capital has no significant effect on productivity (ATO). Based on the above theory, hypotheses can be formulated as follows:

H_{2a}: VACA has a positive effect on company productivity

H_{2b}: VAHU has a positive effect on company productivity

H_{2c}: STVA has a positive effect on company productivity

METHODS

The object of this study is all banking companies listed in Indonesia Stock Exchange (BEI) during 2014-2016 which has a complete financial report and published in the Indonesian Capital Market Directory (ICMD).

The method used in determining the sample is non probability random sampling with purposive sampling method is the sample selection of company stock during the study period based on certain criteria. The criteria determined to obtain the sample under study are as follows: (1) banking companies listed on the Indonesia Stock Exchange (IDX) during the study period, ie from 2014-2016; (2) the sample company has the financial statements for 3 consecutive years, ie the year 2014-2016; (3) companies have complete data during the study period for the factors studied, namely VACA, VAHU, STVA, ROA, and ATO; and (4) the company has no loss in the year of observation.

Research objects that meet the established criteria and can be used in the analysis, there are as many as 30 companies for 3 years from 2014-2016 with 90 observations.

Data analysis tools in this study using structural equation modeling (SEM) in testing the model. Before the data is processed and analyzed, it must first be tested for the quality of data that is outer model and inner model.

Test Outer Model

Outer model (outer relation/ measurement model) defines how each indicator block corresponds to its latent variable. Since it is assumed that the inter-indicator is not correlated, the internal consistency of reliability (cronbach alpha) is not required to test the formative construct reliability (Ghozali, 2006).

Outer models with formative indicators are evaluated based on substantive content that is by

comparing the relative weight and see the significance of the weight size. The individual reflexive size is said to be high if it correlates more than 0.70 with the constructs you want to measure. However, for the initial stage of development of measurement scale the loading values of 0.5-0.6 are considered sufficient (Ghozali, 2006).

Test Inner Model

Inner model is also called (inner relation, structural model, and substantive theory) describes the relationship between latent variables based on substantive theory. The structural model or inner model is evaluated by looking at the percentage variance described by looking at the value of R^2 for

Table 1. Variable Measurement and Operationalization

Variables	Proxy	Measurement
Dependent Variable		
Profitability	Return On Asset (ROA)	Business profits and company efficiency in total asset utilization (Chen et al., 2005). $$ROA = \frac{Net\ Profit}{Total\ assets} \times 100\%$$
Productivity	Asset Turnover (ATO)	Ratio of total revenue to book value of total assets (Firer and William, 2003). $$ATO = \frac{Total\ revenue}{Total\ assets} \times 100\%$$
Independent Variable		
Intellectual Capital (IC / VAIC™)	Physical capital (VACA), Human capital (VAHU), and Structural capital (STVA)	The performance of IC is a combination of the three value added symbolized by the name VAIC ™ (Pulic, 1998), measured by value added obtained from physical capital (VACA), human capital (VAHU), and structural capital (STVA).
The VAIC™ calculation formulation is as follows:	Value Added (VA)	VA is the difference between Output and Input. Output (OUT) -Total sales and other revenues. Input (IN) - Expenses and costs (other than employee expenses). VA = OUT – IN.
	Value Added Capital Employed (VACA)	Capital Employed (CE) includes available funds (equity, net income). VACA shows the contribution made by each unit of CE to the value added organization. $$VACA = \frac{VA}{CE}$$
	Value Added Human Capital (VAHU)	Human Capital (HC) covers the employee expenses. VAHU shows the contribution made by each rupiah invested in HC to the value added organization. $$VAHU = \frac{VA}{HC}$$
	Structural Capital Value Added (STVA)	The STVA measures the amount of SC needed to generate 1 rupiah of VA and is an indication of how SC's success is in value creation. Structural Capital (SC) = VA – HC $$STVA = \frac{SC}{VA}$$
	Value Added Intellectual Coefficient (VAIC™)	VAIC ™ indicates the intellectual ability of the organization. VAIC ™ may also be considered a Business Performance Indicator (BPI). VAIC™ = VACA + VAHU + STVA.

the latent dependent construct by using the Stone-Geisser Q-square test for predictive relevance and t test as well as the significance of the structural path parameter coefficients. Changes in R-squares can be used to assess the effect of certain latent independent variables on latent dependent variables, whether they have substantive influence (Ghozali, 2006).

Here is an equation that reflects hypothesis testing aimed at testing the positive effect of intellectual capital (VAIC ™) on profitability and productivity. Based on the hypothesis that has been developed before, then put forward, 2 statistical models used in the test. The 2 statistical models are as follows.

Effects of VACA, VAHU and STVA on profitability:

$$ROA = \alpha + \beta_1 VACA + \beta_2 VAHU + \beta_3 STVA + \varepsilon$$

Effects of VACA, VAHU and STVA on productivity:

$$ATO = \alpha + \beta_1 VACA + \beta_2 VAHU + \beta_3 STVA + \varepsilon$$

RESULTS

Table 1 shows the statistics descriptive of the VAIC depend dependent variable and the components that make up it, namely VACA, VAHU, and STVA for the period 2014-2016. From the Table 1 it can be seen that VAIC of the banking industry in Indonesia is 3.22 with a standard deviation of 4.60. This shows that banking companies in Indonesia are able to create added value of Rp 3.22 for each rupiah invested in IC. Table 1 also describes the mean values of independent variable measures, ROA and ATO. The mean ROA value is 0.01 and the standard deviation is 0.007. The mean ATO value is 0.13 and the standard deviation is 0.12.

The next test is tested outer model. Outer models are often called (outer relation or measurement models) defining how each indicator block corresponds to its latent variables. Since it is assumed that the inter-indicator is not correlated, the internal consistency of reliability (cronbach alpha) is not required to test the formative construct reliability (Ghozali, 2006).

Reflexive indicators use 3 criteria to assess the outer model, namely convergent validity, composite reliability, and discriminant validity. Formative construct is basically a regression relationship from indicator to construct, then the way to judge is to see the value of the regression coefficient and the significance of the regression coefficient.

Validity test used in this research use convergent validity and discriminant validity. Convergent validity of the measurement model with reflective indicator is judged by correlation between item score/ component score with constructing a score calculated with PLS. If the correlation is more than 0.70 with the construct to be measured, then the individual reflective size is said to be high. However, for early stage studies of development of measurement scale loading 0.5-0.60 is considered sufficient (Ghozali, 2006).

Table 1. Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
VACA	0.13	4.81	0.53	0.82
VAHU	1.15	21.66	2.32	3.68
STVA	0.13	0.83	0.37	0.17
VAICTM	1.46	27.29	3.22	4.60
ROA	0.003	0.03	0.01	0.007
ATO	0.07	0.78	0.13	0.12

Table 2. Value of Outer Weight H_1

	Weights	Std. Deviation	T-Statistic
VAIC			
STVA	0.958	0.075	12.839*
VACA	1.529	0.702	2.178*
VAHU	-1.436	0.735	1.954*
Profitability			
ROA	1.000		

Description: *significant at p < 0.05

Table 3. Value of Outer Weight H_2

	Weights	Std. Deviation	T-Statistics
VAIC			
STVA	-0.083	0.329	0.253
VACA	0.695	0.112	6.205*
VAHU	0.357	0.241	1.483
Productivity			
ATO	1.000		

Description: *significant at p < 0.05

Table 2 shows the model outer test for H_1, the effect of intellectual capital on firm profitability. The result of hypothesis evaluation based on constructing a structural model is done by looking at the significant value of P-value, significant value used with value 0.05 (significance level= 5 percent).

Table 2 is the result of calculation estimation using PLS for data year 2014-2016. Based on outer weight table result of PLS testing, the indicators that make up VAIC are STVA, VACA, and VAHU have significant t-statistics at p < 0.05. VACA t-statistic value of 2.178, significant at p <0.05. The value of t-statistic VAHU is significant at p < 0.05 of 1.954, as well as the t-statistic value of STVA of 12.839 significant at p < 0.05. VACA, VAHU, and STVA have a significant influence on the profitability of the company.

Table 3 is the result of calculation estimation by using PLS for 2014-2016 data on outer model test for H_2, intellectual capital influence to company pro-ductivity. Based on outer weight table result of PLS testing, the indicators that make up VAIC are STVA, VACA, and VAHU. VACA has a signed t-statistic value of 6.205 at p < 0.05. The value of t-statistic VAHU of 1.483, not significant at p < 0.05, while the value of the t-statistic STVA of 0.253 is not significant at p < 0.05. VAHU and STVA have low weight and insignificant value, it is necessary to re-test the indicator that has t-statistics approaching significance.

Testing outer model has been done and then done the inner model test. Inner model or structural model testing is done to see the relationship between construct, significance value, and R-square of the research model. The structural model is evaluated by using an R-square for dependent constructs, Stone-Geisser Q-square test for predictive relevance, and t test as well as the significance of the structural path parameter coefficients.

Table 4. Value of R-Square

Variables	R-Square
IC	-
Profitability	0.488
Productivity	0.977

Table 4 shows that the R-square profitability is 0.488, meaning that the IC variable is able to explain the profitability variable of 48.8 percent. R-square profitability is a test against H_1, while R-square value 0.977 is the result of testing on H_2. The larger the R-square number indicates the greater the independent variable can explain the dependent variable, so the better the structural persuasion.

Table 5 shows the value of inner weights. From the processed data it was found that t-statistics between IC, profitability, and productivity were above 1.645, significant at $p < 0.05$ (1-tailed). The t-statistic value of IC on profitability is 11.864, significant at $p < 0.05$. The t-statistic value of IC on productivity is 23.906, significant at $p < 0.05$. This indicates a significant effect on IC (VAIC™) on company profitability, meaning H_1 is accepted. H_2 is accepted for inner weights with a significance of 23.906. IC has a significant effect on company productivity.

DISCUSSION

The Impact of Intellectual Capital on Profitability

Result of test to H_1, that is the impact of intellectual capital on profitability. The results show that STVA, VACA, and VAHU have significant t-statis-

tics at $p < 0.05$. Therefore, all hypotheses H_{1a}, H_{1b}, and H_{1c} are accepted. The results of the inner model test as a whole show significant effect on IC (VAIC) to company profitability, mean H_1 accepted with significance 11.864.

The results of this study are consistent with Artinah (2011), Rachmawati (2012), Suhendah (2012), Hermanus, Patricia, & Setiawan (2013), Melani & Suwarni (2013), and Faza & Hidayah (2014) which has the influence of intellectual capital on profitability. The higher the value of VAIC, the higher the profitability of the banking company. This indicates the company is getting better at managing assets that result in increased return on assets owned by the company as measured by ROA.

The Impact of Intellectual Capital on Productivity

Result of test to H_2, that is the impact of intellectual capital on productivity. Outer model test results show only VACA has significant t-statistics at $p < 0.05$, while VAHU and STVA are not significant at $p < 0.05$. The results of the inner model test as a whole show significant effect on IC (VAIC™) on company productivity, meaning H_2 are accepted for inner weights with a significance of 23.906.

The results of this study are consistent with Shiri & Mousavi's research (2015) but contrary to the results of the Suhendah (2012) study and Faza & Hidayah (2014) which found that ICs have no significant effect on productivity. IC is an important tool in decision making for decision makers such as managers, capital market analysts, borrowers, and

Table 5. Value of Inner Weights

Variabel	Original Sample Estimate	T-Statistic	Std. Deviation	Decision
IC -> Profitability	0.699	11.864	0.059	H_1 accepted
IC -> Productivity	0.988	23.906	0.041	H_2 accepted

Description: *significant at $p < 0.05$ (1-tailed)

investors. Productivity can combine the dimensions of efficiency and effectiveness. Productivity must have adequate resources and be used appropriately. In-process activities and resources must have added value in the product/ service generated.

VACA has a positive and significant influence on the productivity of the company so that H_{2a} is accepted. The results of this research are consistent with Komnenic, Tomic, & Pokrajèiæ (2011) and Hermanus, Patricia, & Setiawan (2013). Banking companies have been able to use physical capital to improve the efficiency of the company. VAHU has no significant t-statistics value, so H_{2b} is rejected. The results of this study are contrary to the findings of Komnenic, Tomic, & Pokrajèiæ (2011) and Hermanus, Patricia, & Setiawan (2013). This means that the utilization of human resources in banking companies is still lacking, resulting in inefficiency in managing the organization.

STVA does not significantly affect productivity. This can be seen from the insignificant t-statistics value, so H_{2c} is rejected. The results of this study are relatively similar to the findings of Komnenic, Tomic, & Pokrajèiæ (2011) and Hermanus, Patricia, & Setiawan (2013). Measurements in the VAIC methodology are considered incomplete, because advertising costs are treated as an expense and not included as part of structural capital.

Structural capital represents all things related to knowledge in the organization. Structural capital includes everything that remains after the end of business hours, such as relationships with suppliers, clients, local commodities, government, and shareholders. Structural capital applied to banking companies is still low. Companies should be able to provide comfortable, friendly, and trustworthy conditions with suppliers, clients, local commodities, government, and shareholders. With the increase

of structural capital will increase the interaction of good relations, among others which in turn can improve the productivity of the company.

CONCLUSION AND SUGGESTIONS

Conclusion

Based on the results of research and discussion of the discussion conducted in this study, there are some conclusions that can be taken, among others, are: (1) IC (VAIC™) has a positive and significant (VAIC™) effect on profitability for 3 years' observation 2014-2016 VACA, VAHU, and STVA have a positive and significant effect on profitability. The higher the value of VAIC, the higher the profitability of the banking company. This indicates that the company is getting better in managing the assets that result in increased return on assets owned companies measured by ROA; (2) IC (VAIC™) has a positive and significant effect on productivity VACA has a positive and significant influence on productivity, while VAHU and STVA are not. Companies have been able to use physical capital to improve the efficiency of the company.

Suggestions

Based on the analysis and conclusion of the research, there are some suggestions that resulted in this research, among others, are: (1) further research need to add other variables, for example market to book value ratio (MB) and earnings per share (EPS); (2) for further research, it is expected that the samples will be used not only from the banking company group, but from the group other than the manufacturing company to be the focus of the research; and (3) increase the number of observation periods.

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