INTELLECTUAL CAPITAL AND FINANCIAL PERFORMANCE; EVIDENCE FROM THE REGIONAL DEVELOPMENT BANK IN INDONESIA

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Abstract: The banking sector is the most active sector in Indonesia's economy and it plays an active role in the economic development of the country. Using Regional Development Bank panel data in Indonesia for the period 2001-2015, this study examines the impact of IC and its components on the financial performance of banks in Indonesia. This study finds VAIC, STVA and VACA have positive and significant impact on ROA in banks in Indonesia. For control variables, only EQ/TA variables, in all models have a positive and significant effect on ROA.

Keywords: intellectual capital, return on assets and banks in Indonesia

I. INTRODUCTION

1.1. Background

Competition of financial institutions is getting tighter along with the implementation of the ASEAN Economic Community (AEC). The challenge of financial institutions with the AEC is clear, the competition will be higher, but especially for the banking sector has been very open. This means the bank should improve its performance, particularly profitability. Increased intellectual capital (IC) can drive the improvement of bank performance.

The competitiveness of a company lies not only in the possession of intangible assets. An intangible asset in question is IC. Using science and technology, it can be obtained how to use other resources efficiently and economically, which can create competitive advantage. Knowledge-based companies have employees who have the skills, expertise and high innovation. Using knowledge, the firm's investment in tangible assets is smaller than intangible assets that get bigger investment allocations. Increasing corporate investment in intangible assets, the greater the company's awareness of the importance of IC.

IC is believed to play an important role in improving financial performance. This is due to the awareness that IC is the foundation for companies to survive and excel in the competition. This awareness, among others, is marked by the increasing frequency of knowledge based company's terms in business discourse. The term is aimed at companies that rely more on the management of IC as a resource and long-term growth. Companies that are able to utilize their IC efficiently and economically, then its market value will increase including banks.

The implementation of IC in Indonesia is still minimal. This can be seen from the rarity of companies give more attention to IC which includes human capital, structural capital, and customer capital. In many cases, until now most of the companies in Indonesia tend to use conventional based in building their business so that the resulting product is still poor technological content. Though these companies will be better able to compete when using competitive advantage obtained through creative innovations generated by the IC of the company. This will encourage the creation of more favourable products in the eyes of consumers.

Using Regional Development Bank (RDB) panel data in Indonesia for the period 2001-2015, this study examines the impact of IC on the financial performance of banks in Indonesia. This study also examines three components of IC, namely human capital, structural capital, and customer capital. I also use control variables that are macroeconomic conditions (GDP and inflation) industry specific (competition) and bank-specific (loan, credit risk, asset, non-interest income and capital).

1.2. Outcomes & Contributions

Our paper also contributes to the existing literature on the determinants of banks' profitability (e.g., Athanasoglou, *et al*, 2008; Sufian, 2009; Sufian and Habibullah, 2009; Sufian, 2012; Pattitoni, *et al*, 2014 and Yudaruddin, 2017). Previous papers show that the profitability of a bank depends on both exogenous factors, such as Gross Domestic Product, inflation, market share concentration, tax (among others, Samad, 2008; Athanasoglou, *et al*, 2008; Ana, *et al*, 2011; Ben Khediri, and Ben-Khedhiri, 2009; Æurak *et al*, 2012; Dietrich and Wanzenried, 2010; Flamini, *et al* 2009; Karimzadeh *et al*, 2013; Pattitoni, *et al*, 2014; Petria *et al*, 2015; Sufian 2012; Sufian and Habibullah, 2009) and bank characteristics: loan, size, income, and capital (among others, Alexiou and Sofoklis, 2009; Ana, *et al*, 2011; Athanasoglou, *et al*, 2008; Dietrich and Wanzenried, 2010; Petria *et al*, 2015; and Sufian, 2009). I extend this literature by documenting that an effective way that it provides banks in Indonesia with a simple method in understanding and evaluating performance, as well as enhancing the management of IC.

II. STUDY REFERENCES

2.1. Resources Based Theory

Resources Based Theory (RBT) was pioneered by Penrose (1959), which argued that corporate resources are heterogeneous, unchanging and productive services derived from company resources, can provide a unique character for each company. In RBT, the company's resources cover all assets, capabilities, organizational processes, company attributes, information or knowledge controlled by the company that enables the company to understand and implement the development of strategies to improve the efficiency and effectiveness of the company.

2.2. Intellectual capital

The history of the emergence of intellectual capital management began in 1980 when managers, academics and consultants realized that the intangible assets of a company were ICs that were often the main determinants of a company's profit. According to Marr and Schiuma (2003), IC is the group of knowledge assets that is attributed to an organization and most significantly contributes to the key stakeholders. Chatzkel (2002: 6) IC is the forefront of knowledge, experience, organizational technology, relationships, and professional skills that can create competitive advantage in the market. However, according to Stewart (1998) states that intellectual capital is the intellectual capital of knowledge, information, intellectual property, and experience that can be used to create wealth.

Intellectual capital consists of intangible resources and organizational assets that can be used to create added value by converting it into new processes, products, and services to an organization (Al-Ali, 2003: 5-6). IC can be used to help the company's business continuity in order to achieve long-term competitiveness. The IC measurements in this study are proxied as revealed by Pulic (1998) to assess the efficiency of the added value as a result of the intellectual capability of the enterprise corresponding to the three categories, VAIC ™ (value added intellectual coefficient). VAIC™ is a control management tool that enables organizations to monitor and measure the intellectual capital performance of a company. This model begins with the company's ability to create value added (VA). VA is calculated as the difference between output and input.

The main components of VAIC™ can be seen from the company's resources, namely human capital calculated by VAHU (value added human capital), structural capital calculated by STVA (structural capital value added) and costumer capital calculated by VACA (value added capital employed) . Human capital is calculated using value added human capital (VAHU). VAHU is the ratio of VA (value added) to HC (human capital), which indicates the

contribution made by each rupiah invested in HC for value added organization, or the relationship between VA and HC indicating HC's ability to create value in a company. Structural capital calculated structural capital value added (STVA). STVA is a structural capital ratio to value added that measures the amount of SC (structural capital) required to produce a value of VA (value added). STVA is an indicator of SC's success in value creation. VACA is an indicator for value added created by a unit of physical capital to the company's value added. VACA is a comparison between value added (VA) and physical work model (CE). In the process of value creation, the potential intellectuals represented in employee costs are not counted as costs. It can be assumed that if one unit of CE produces a larger return on a firm, it means the company is better at utilizing the CE (available funds).

2.3. Intellectual capital and Financial Performance

Based on resource based theory, IC owned company able to create competitive advantage of company so that can improve company performance become better. The better the company manages the three components of intellectual capital, indicating the better the company is in managing the assets. Good asset management can increase the return on a number of assets owned by the company. The higher the intellectual capital the profit increases, which makes the value of financial performance increased. Thus intellectual capital will contribute to the financial performance of the company.

Based on research conducted by Al - Musali and Ku Ismail (2014) that the IC has a positive and significant impact on the financial performance of the company. Similarly, the study conducted by Kamukama, *et al* (2010), Afroze (2011), Ting and Lean (2009) found that the higher the value of IC, the better the financial performance can be obtained. However, research conducted by Maditinos, *et al* (2011) found that there is no significant relationship between intellectual capital and corporate financial performance because the VAIC™ method ignores the company's risk level, which is one of the most important factors that determine the firm and the value of intellectual capital.

2.4. Human Capital and Financial Performance

Human capital becomes a very important capital for companies in creating added value. The added value can increase if the company is able to use the knowledge possessed by its employees. Therefore, high human capital will encourage the improvement of financial performance. Based on research conducted by Kamukama, *et al* (2010), Mondal and Ghosh (2012) and Uadiale and Uwuigbe (2011), human capital shows significant positive results on financial performance. Al - Musali and Ku Ismail (2014) stated that the creation of added value depends on human capital so that the use of human capital tends to be better to survive in competition. In addition, Iqbal, *et al* (2013) suggests that human capital greatly helps to enhance the individual employee skills used to create a unique and competitive strategy for the organization.

2.5. Structural Capital and Financial Performance

Structural capital is related to the structure of enterprise and information systems that can cause business intelligence. Companies that have good employee resources, if not supported by a good system then the company can not optimize the potential of the employee to the fullest. Structural capital is a form of real wealth for the company. In a study conducted by Bhatia and Aggarwal (2015) and Chu, *et al* (2011) stated that structural capital has a positive and significant impact on financial performance. However, unlike the study conducted by Kamal, *et al* (2012) which states that structural capital does not provide a significant impact on financial performance. This hypothesis is based on the research of Janosevic and Dzenopoljac (2013) which shows that structural capital has a significant positive effect on financial performance. In conclusion, structural capital is the most influential component for profit and competitive advantage for the company so as to improve financial performance

2.6. Customer Capital and Financial Performance

Customer capital is an organizational relationship with people who do business with the organization. Costumer capital can arise from various parts outside the company's environment in enhancing business cooperation that can

provide benefits for both parties, so as to improve the performance and value of the company. Ze'ghal and Maaloul (2010) and Soedaryono, *et al* (2012) found that customer capital has a positive and significant effect on financial performance. Significant positive effects were also found in the study by Iqbal, *et al* (2013) who said that customer capital can increase the level of employee motivation resulting in a higher productivity capacity form of employees. In contrast to the study by Dadashinasab, *et al* (2015), which shows the impact of customer capital has no significant effect on financial performance. This hypothesis is based on research conducted by Winarso and Park (2015) which states that customer capital has a significant impact on financial performance, because the total equity of the company has affected the company in managing the total assets owned to generate profits to be more effective and efficient.

2.7. Contorl Variable

The size of the company can be seen from the total assets owned by the bank. Athanasoglou, *et al* (2008), Alexiou and Sofoklis (2009), Sufian (2009) and Petria *et al* (2015) describe the relationship between the size of the bank to profitability in some of the literature shows the inverted U pattern. Increasing the size of the bank on one side will increase economies of scale thereby increasing profitability, but on the other hand the bigger banks can make a bank becomes inflexible resulting in lower performance. Size can be proxied by bank with total assets of natural logarithm (LnAsset). Alexiou and Sofoklis (2009), Ayadi and Boujelbene (2012), Flamini, *et al*, (2009), Petria *et al* (2015), Roman and Dãnuleþiu (2013), Scott and Arias (2011) and Sufian (2012) find that total asset gives positive effect on profitability, while Ben Naceur and Goaied (2005), Hoffmann (2011), Pattitoni, *et al* (2014), Sufian and Habibullah (2009) find a significant negative effect total asset.

The ratio of loan loss provision to total assets (LLP/TA) is a proxy of the credit risk. Relations LLP/TA to profitability is negative due to bad credit will reduce the profitability of banks. Alexiou and Sofoklis (2009), Ana, *et al* (2011), Athanasoglou, *et al* (2008 Dietrich and Wanzenried (2010), Petria *et al* (2015) and Sufian (2009) find that increased LLP/TA will reduce profitability and significant.

The bank's main income comes from the difference in fund-raising with the distribution of funds in the form of lending (conventional banks). But the bank also has a non-interest income (fee base income) as a form of diversification of the business conducted by the bank. The bank's business diversification is measured from the ratio of non-interest income to total assets (NII/TA). Relations NII/TA to profitability is positive. Research conducted Ana, *et al* (2011), Sufian (2009), Sufian (2012) and Sufian and Habibullah (2009) find a significant positive effect NII/TA to profitability.

Capital strength can be measured by the ratio of capital to total assets (EQ/ TA). Relations EQ/TA to profitability is positive. Decrease EQ/TA will imply leverage and increased risk and therefore the cost of borrowing becomes large so that the lower profitability of banks. Alexiou and Sofoklis (2009), Ana, *et al* (2011), Athanasoglou, *et al* (2008), Ayadi and Boujelbene (2012), Ben Khediri, and Ben-Khedhiri (2009), Flamini, *et al*, 2009), Petria *et al* (2015), Roman and Dãnuleþiu (2013), Stanèìæ, *et al* (2014), Sufian (2009), Sufian (2012), Sufian and Habibullah (2009) find significant positive impact EQ/TA on bank profitability.

GDP is used to measure the economic condition of a country. GDP will affect the banks' intermediation function even though Sufian (2009) describes the impact on profitability can be positive or negative. Research results from Athanasoglou, *et al* (2008), Ana, *et al* (2011), Ben Khediri, and Ben-Khedhiri (2009), Æurak *et al* (2012), Dietrich and Wanzenried. (2010), Flamini, *et al* (2009), Karimzadeh *et al* (2013), Lin and Rowe (2006), Pattitoni, *et al* (2014), Petria *et al* (2015), Sufian (2012), Sufian and Habibullah (2009) found that GDP is positive and significant impact on the profitability of banks.

For inflation, the relationship between inflation and profitability ambiguous (Petria *et al*: 2015). Roman and Dãnuleþiu (2013) explain the implications of inflation depends on the ability of banks to anticipate the impact of inflation. When there is inflation and the bank

anticipates undertaking adjustments in interest rates, the increase in inflation is positively associated with profitability. A significant positive impact on profitability inflation found in the study Ana, *et al* (2011), Flamini, *et al*, 2009), Karimzadeh *et al* (2013), while Pattitoni, *et al* (2014) with significant negative results.

III. RESEARCH METHODS

3.1. Emperical Model

The research model in the study adapts Kamukama, *et al* (2010), Afroze (2011) and Nor and Karem (2011). The research model is divided into four models. Model I is used to capture the intellectual influence of capital on financial performance. Models II, III and IV are used to capture the impact of each component of intellectual capital on financial performance.

$ROA = \alpha + \beta_1 ROA_{,t-1} + \beta_2 VAIC_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 LLP/TA_{i,t} + \beta_5 NNI/TA_{i,t} + \beta_6 EQ/TA_{i,t} + \beta_7 GDP_t + \beta_8 INF_t + \varepsilon_{i,t}$ .... model I

$ROA = \alpha + \beta_1 ROA_{,t-1} + \beta_2 VAHU_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 LLP/TA_{i,t} + \beta_5 NNI/TA_{i,t} + \beta_6 EQ/TA_{i,t} + \beta_7 GDP_t + \beta_8 INF_t + \varepsilon_{i,t}$ .... model II

$ROA = \alpha + \beta_1 ROA_{,t-1} + \beta_2 STVA_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 LLP/TA_{i,t} + \beta_5 NNI/TA_{i,t} + \beta_6 EQ/TA_{i,t} + \beta_7 GDP_t + \beta_8 INF_t + \varepsilon_{i,t}$ .... model III

$ROA = \alpha + \beta_1 ROA_{,t-1} + \beta_2 VACA_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 LLP/TA_{i,t} + \beta_5 NNI/TA_{i,t} + \beta_6 EQ/TA_{i,t} + \beta_7 GDP_t + \beta_8 INF_t + \varepsilon_{i,t}$ .... model IV

3.2. Variable Selection

The dependent variables in this paper is Profitability. The profitability is proxied with Return on Assets (ROA) which refer to the individual bank and t refers to the time of the year. The independent variables used consist of three intellectual capital components, namely human capital, structural capital, and customer capital.

Bank specific dan economic condition variables are also used as control variables. Firm size (SIZE) as measured by log natura total assets. For credit assessment is proxied ratio Loan Loss Provision in net interest income (LLP) is expected negative. The bank's business

diversification is measured from the ratio of non-interest income to total assets (NII/TA). Relations NII/TA to profitability is positive. Capital strength can be measured by the ratio of capital to total assets (EQ/ TA). Relations EQ/TA to profitability is positive. GDP will affect the banks' intermediation function even though Sufian (2009) describes the impact on profitability can be positive or negative. For inflation, the relationship between inflation and profitability ambiguous (Petria *et al*: 2015). Operationally the variables in Table 1 as follows:

3.3. Data and Tool

The data used are secondary data in the form of banks financial statements that published by Bank Indonesia. While the macroeconomic data used in this study is the annual report data released by Indonesia's Central Statistics Agency (BPS). The analysis tools used in this study is dynamic panel (GMM method). This study estimate all our models using the system GMM estimator to control for possible simultaneity and endogeneity problems in our model (Arellano and Bond, 1991).

IV. RESEARCH RESULTS

4.1. Result and Discussions

Descriptions of all the variables are listed in Table 2. Overall the mean values of all the variables are smaller than the standard deviation. This study provides information that the mean value of each variable still represents of each variable analyzed. Overall, the variable is a normal distribution variable.

The relationship between the independent variables showed multicolinearity on the model. Table 3 provides information on the correlation between the independent variables. The matrix shows that in general the correlation between the explanatory variables is not strong, suggesting that multicollinearity problem is not severe kecuali variabel VAHU dengan VAIC karena VAHU adalah salah satu komponen VAIC.

Table 4 reports the empirical results of intellectual capital (IC) performance of banks in Indonesia using value-added intellectual coefficient (VAIC) methodology, and investigates the impact of IC on financial

Table 1
Description of the variables used in the regression models

Variable	Measure	Expected effect
Dependen Variable		
ROA	ROA measure of profit before tax divided by average total assets in the year t	
Independen Variable		
VAIC^{TM}	The value added intellectual capital (VAIC) method explained by Public (1998) and El-Bannany (2012) will be used to measure the intellectual capital performance. Output = total revenues Input operating costs (excluding staff related costs) VA_{it} = Output – Input HC_{it} = Human capital staff related costs (considered as investment) SC_{it} = Structural capital $(VA_{it}-HC_{it})$ CE_{it} = Capital employed (The book value of total tangible Asset) $VAHU_{it}$ = Value Added efficiency of human capital (VA_{it} / HC_{it}) $STVA_{it}$ = Value Added efficiency of structural capital $(SC_{it} / VA_{it}$ $VACA_{it}$ = Value Added efficiency of capital employed (VA_{it} / CE_{it}) $VAIC^{TM} = VAHU_{it} + STVA_{it} + VACA_{it}$	+
Control Variable		
SIZE	Used to describe the size of the bank (economies of scale) measured natural logarithm of total assets of banks in t	+/-
LLP/TA	As an indicator of credit risk, which shows how much the allowance for credit losses by total assets is provided in t	-
NII/TA	Measuring bank earnings did not come from the bank's main businesses are calculated from non-interest income by total assets of banks in the year t	+
NIE/TA	Explaining the bank's efficiency in generating non-interest income is calculated from the burden of non-interest per total assets of banks in the year t	-
EQ/TA	Measuring the strength of the bank's capital. Measured by the ratio of capital to total assets of banks in the year t. The greater the ratio of capital to assets and debt, the lower the risk.	+/-
GDPNAS	Growth Gross Domestic Product at Current Market Prices (billion rupiahs).	+/-
INFNAS	the annual inflation rate in Indonesia	-
α	constants	
$β_1$- $β_8$	the regression coefficient	
$ε_{it}$	residual value (*error*)	

performance. Financial performance is measured by return on assets (ROA). ROA reflects the efficiency of utilizing available assets in creating profits and it is calculated as the annual net profit of individual bank before tax divided by average total assets

My estimation results show a stable coefficient, having fairly stable coefficients, while the Wald-test indicates fine goodness of fit and the Sargan-test shows no evidence of over-identifying restrictions. Even though the equations indicate that first-order autocorrelation is present, this does not imply that the estimates are inconsistent. Inconsistency would be implied if second-order autocorrelation was present (Arellano and Bond, 1991), but this case is rejected by the test of AR (2) errors.

Our lagged dependent variable, which measures the degree of persistence of ROA, is statistically significant across all models, indicating the dynamic character of model specification of lending behaviour. In other words, ROA are a high degree of persistence of financial performance and justifying the use of a dynamic model.

Table 2
Descriptive statistics

Variable	Mean	Std. Dev	Minimum	Maximum	Obs.
ROA	3.473846	1.262753	0.010000	7.44000	390
VAIC	3.820311	2.177960	0.773940	38.6464	390
VAHU	2.715092	2.087109	0.846743	36.9586	390
STVA	0.582873	0.118725	-0.180995	0.97294	390
VACA	0.522345	0.303815	0.108192	4.47465	390
SIZE	15.29436	1.201012	12.10470	18.2340	390
LLP/TA	0.011968	0.009504	-0.010502	0.08029	390
NNI/TA	0.008118	0.006472	0.000457	0.05545	390
EQ/TA	0.107730	0.035487	0.000078	0.21455	390
GDP	8.416779	0.667069	7.291421	9.35364	390
INF	7.848667	3.808682	2.800000	17.1000	390

The impact of IC on financial performance is divided into four models. The results of using VAIC as an aggregate measurement (Models 1), the explanatory power of the models using the three VAIC components (Models 2, 3 and 4) showed a substantial increase, suggesting that stakeholders and managers may have different emphases on the three components of VAIC.

VAIC has a positive and significant impact on ROA in banks in Indonesia. These positive and significant results indicate that when intellectual capital increases, it will give effect to the increasing of financial performance at bank in Indonesia. The results of this study are consistent with the results of studies conducted by Kamukama, *et al* (2010), Afroze (2011), Ku Ismail and Karem (2011). As a company that is intellectual intensive, more intensive use of human capital human capital banking companies are required able to utilize and manage their intellectual resources (human capital, structural capital and costumer capital) effectively and efficiently in order to obtain maximum profit.

VAHU has positive and insignificant effect on ROA in banks in Indonesia. In other words, human capital does not have a significant impact on financial performance because investments made for human resource development through personnel costs for qualified employees have not fully supported the improvement of the company's added value. The results of this study are not in line with Kamukama, *et al* (2010) and Uadiale and

Uwuigbe (2011) Al-Musali and Ku Ismail (2014) Iqbal, *et al* (2013) and Mondal and Ghosh (2012) studies which say that human capital is influential positive significant to financial performance so that this shows that the increase of human capital investment can improve financial performance.

Structural capital is a form of real wealth for the company. The results of this study found that STVA has a positive and significant effect on ROA in banks in Indonesia. These positive and significant results indicate that structural capital is a component that affects the benefits and competitive advantage for the company so as to improve the financial performance of banks in Indonesia. The results of this study are consistent with the results of studies conducted by Bhatia (2015) and Chu, *et al* (2011) states that structural capital has a positive and significant impact on financial performance.

Costumer capital can arise from various parts outside the company's environment in enhancing business cooperation that can provide benefits for both parties, so as to improve the performance and value of the company. The results of the study found that VACA had positive and insignificant effect on ROA in bank in Indonesia. Costumer capital does not have a significant impact on financial performance indicates that the company's total equity has not affected the company in managing its total assets to make profits more effective and efficient. This result is not in line with the study of

Table 3
Correlation Matrix for the Explanatory Variables

	VAIC	VAHU	STVA	VACA	SIZE	LLP/TA	NNI/TA	EQ/TA	GDP	INF
VAIC	1.0000									
VAHU	0.9895	1.0000								
STVA	0.5629	0.5362	1.0000							
VACA	0.1511	0.0143	-0.0392	1.0000						
SIZE	-0.1492	-0.1248	-0.1432	-0.1562	1.0000					
LLP/TA	-0.0671	-0.0429	-0.1014	-0.1465	0.0649	1.0000				
NNI/TA	-0.0704	-0.0694	-0.0780	0.0028	0.1402	0.2007	1.0000			
EQ/TA	-0.0651	-0.0070	0.1621	-0.4821	0.0051	0.2514	0.2944	1.0000		
GDP	-0.2098	-0.1776	-0.2650	-0.1805	0.6389	0.1776	0.3633	0.3465	1.0000	
INF	0.1221	0.1046	0.1430	0.1011	-0.3292	-0.0774	-0.2689	-0.1630	-0.5207	1.0000

Table 4
GMM estimation

Explanator Variables	Model I Coefficient	z	Model II Coefficient	z	Model III Coefficient	z	Model IV Coefficient	z
ROA$_{-1}$	0.3729981***	6.62	0.3741262***	6.63	0.3084114***	5.78	0.3741262***	6.63
VAIC	0.0425489*	1.79						
VAHU			0.0358086	1.45				
STVA					3.489252***	6.31		
VACA							0.0358086	1.45
SIZE	-0.5064113	-1.42	-0.5041494	-1.42	-0.8513708**	-2.55	-0.5041494	-1.42
LLP/TA	-14.37648*	-1.93	-14.38678*	-1.93	-7.71231	-1.11	-14.38678*	-1.93
NNI/TA	18.88683*	1.90	19.32216*	1.94	9.890124	1.06	19.32216*	1.94
EQ/TA	10.22262***	4.22	10.03537***	413	8.048454***	3.55	10.03537***	4.13
GDP	0.1597826	0.36	0.1510474	0.34	0.7157541*	1.69	0.1510474	0.34
INF	0.0194664	1.56	0.0196608	1.57	0.0181438	1.57	0.0196608	1.57
Wald Test	132.48		130.83		191.71		130.83	
Sargan Test[1]	125.3398		125.9888		114.0003		125.9888	
AR (1)[2]	-8.183		-8.1685		-8.084		-8.1685	
	0.0000		0.0000		0.0000		0.0002	
AR (2)[3]	1.8097		1.7923		1.8418		1.7923	
	0.0703		0.0731		0.0655		0.0731	

*,**, and *** denote significance at 10%, 5% and 1% levels, respectively

[1] The test for over-identifying restrictions in GMM dynamic model estimation

[2] Arellano-Bond test that average autocovariance in residuals of order 1 is 0 (H0: no autocorrelation)

[3] Arellano-Bond test that average autocovariance in residuals of order 2 is 0 (H0: no autocorrelation)

Ze'ghal and Maaloul (2010) and Soedaryono, *et al* (2012) that customer capital has a positive and significant impact on financial performance.

For control variables, only EQ / TA variables, in all models have a positive and significant effect on ROA. Positive results in accordance with expectations and previous research. Relations EQ/TA to profitability is positive. Decrease EQ/TA will imply leverage and increased risk and therefore the cost of borrowing becomes large so that the lower profitability of banks.

Hasil ini sejalan dengan penelitian yang dilakukan oleh Alexiou and Sofoklis (2009), Ana, *et al* (2011), Athanasoglou, *et al.* (2008), Ayadi and Boujelbene (2012), Ben Khediri, and Ben-Khedhiri (2009), Dietrich and Wanzenried. (2010b), Flamini, *et al*, 2009), Petria *et al* (2015), Roman and Dãnuleþiu (2013), Stanèiæ, *et al* (2014), Sufian (2009), Sufian (2012), Sufian and Habibullah (2009) find significant positive impact EQ/TA on bank profitability.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusion

This study aims to examine the impact of intellectual capital on the financial performance of banks in Indonesia over the last 10 years. The impact of IC on financial performance is divided into four models. The results of using VAIC as an aggregate measurement and the explanatory power of the models using the three VAIC components.

Using Regional Development Bank panel data in Indonesia for the period 2006-2015, this study examines the impact of IC and its components on the financial performance of banks in Indonesia. VAIC, STVA and VACA have positive and significant impact on ROA in banks in Indonesia. For control variables, only EQ / TA variables, in all models have a positive and significant effect on ROA.

5.2. Recomendation

In conclusion, first, this finding could also help policy-making in Indonesia to formulate and implement bank performance improvement policies through increased intellectual capital for the banking sector and Second, this study may provide input to Indonesia bank managers develop relevant strategies and policies on how to build and improve their IC's.

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