DETERMINANTS OF INTELLECTUAL CAPITAL PERFORMANCE: EMPIRICAL EVIDENCE FROM INDONESIA

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Abstract: The purpose of this paper is to investigate the determinants of IC performance banks in Indonesia over the period 2006-2015. I divided the focus of research on three samples of government-owned banks, foreign-owned banks and domestic-owned banks. The analysis tools used in this study is the generalized method of moments. Barriers to entry variables significantly negatively affect intellectual capital in banks in Indonesia, especially in domestic banks in Indonesia. Variable the efficiency of investment in IC has a significant negative effect on intellectual capital in banks in Indonesia, especially in state-owned and domestic banks in Indonesia. The study found a positive and significant bank risk on intellectual capital in all samples of banks in Indonesia. Profitability has a positive and significant sign on the IC especially in state-owned and domestic banks in Indonesia.

Keywords: Intellectual Capital and Bank in Indonesia

I. INTRODUCTION

1.1. Background

Intellectual Capital (IC) can be used to help the company's business continuity in order to achieve long-term competitiveness. ICs consist of intangible resources and assets that can be used to create added value by converting them into new processes, products and services to a company (Al-Ali, 2003).

Implementation of IC in Indonesia is still low. This can be seen from the rarity of companies give more attention to the IC which includes human capital, structural capital, and customer capital. In most cases, the majority of companies in Indonesia tend to use conventional based in building their business so that the resulting product is still poor in technological content (Sawarjuwono and Kadir, 2003)

In addition, these companies will be better able to compete when using competitive advantage obtained through creative innovations produced by IC companies. This will encourage the creation of more favourable products in the eyes of consumers. In addition, in Indonesia the measurement of financial performance is usually only seen from its production activities only and the management system is still conventional based where natural resources, financial resources, and physical capital is the main benchmark

In fact, the business world in Indonesia is still low has a competitive advantage in innovative activities that lead to low competitiveness. This is evidenced from the World Economic Forum report in 2015 the position of Indonesia's competitiveness is at the level of 37 among 140 countries that declined from the previous year. Of course, Indonesia is less competitive with other ASEAN countries such as Malaysia, Singapore and Thailand. Based on the World Economic Forum report, said that Indonesia's performance has not changed much from last year, even still tend to be unstable. Causes of low competitiveness include low quality of Indonesian IC (such as lack of competence and application of technology and knowledge). So that Indonesia's human resources are still less able to compete in the global environment.

The purpose of this paper is to investigate the determinants of IC performance banks in Indonesia over the period 2006-2015. I divided the focus of research on three samples of government-owned banks, foreign-owned banks and domestic-owned banks. This division is to capture the more specific impact of determinants of bank IC in Indonesia. The generalized method of moments (GMM) is a generic method for estimating parameters in statistical models is used to test the relationship between the IC performance as a dependent variable and certain independent variables.

1.2. Outcomes & Contributions

The contribution of this paper are as follow: first, I divided the focus of research on three samples of government-owned banks, foreign-owned banks and domestic-owned banks. Previous studies examined the determinants of IC in banks in general (El-Bannany, 2012) I extend this literature by documenting that there are differences in the determinants of IC between banks based on their ownership.

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 IC 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 IC is the IC of knowledge, information, intellectual property, and experience that can be used to create wealth.

IC 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 IC 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).

In the banking literature, some factors which can be considered as determinants of IC performance are: bank efficiency, barriers to entry, efficiency of investment in IC, bank profitability and bank risk. (El-Bannany, 2008).

2.2. Barriers to entry

El-Bannany (2012) found that companies with high entry barriers will be protected from new competitors. As a result, the condition of the company's employees becomes unstoppable and unmotivated to produce innovation. This situation will have an adverse effect on employee performance (human capital). Different studies were conducted by Depoers (2000), who argued that the potential for entry of new competitors into the market affects the future of company cash flows established within a particular industry. The effect of ownership costs associated with a new competitor is also unavoidable. Therefore, ownership costs can be measured by barriers to entry. Barriers to entry can protect the company from entry of new competitors and also reduce the cost of ownership. Companies with high entry barriers will disclose their IC information significantly than firms with low entry barriers.

2.3. Efficiency of Investment in IC

Kannan and Aulbur (2004) argue that investment will be more efficient when the contribution of investment (human capital) is greater on value creation and motivate bank employees to continue innovation to maintain investment efficiency in ICs. The efficiency of the company can be seen from the comparison between input and output. The smaller the ratio of input and output the more efficient the company. IC can be defined as intellectual resources that are formalized, owned and utilized in increasing asset value. Based on research conducted Malhotra (2003) and Stovel and Bontis (2002), said that human capital is a combination of knowledge, skills, innovation and ability of a person to carry out their duties so as to create a value to achieve goals.

2.3. Bank profitability

El-Bannany (2008) documented that profitability is the level of profit that firms earn, which in which a high level of profitability will make firms do more activities that increase the profitability of the firm. Meanwhile, companies that fail to improve the profitability of their company will be useless time to increase innovation because the company will be busy investigating the reasons for the failure of the company.

According to a study conducted by Ousama, et al (2012) corporate profits have a signal to show that companies with better profitability will provide more information about their company's ICs. One of the factors causing to increase profitability of companies to be higher caused by IC owned by company. Companies tend to disclose information about ICs significantly which will result in IC disclosure also becoming higher. Mondal and Ghosh (2014) argue that bank and IC profitability are positively related. The high profitability of banks makes managers easier to convince shareholders of superior corporate managerial skills.

2.3. Bank risk

El-Bannany (2008) found that good IC performance can reduce the negative impact of higher bank risk by managing the bank's risks. Banks in risky positions will be better intellectually than low-risk banks, as more risky banks will seek to minimize the negative impact of bank risk. Patton and Zelenka (1997), states that the percentage of intangible assets is a proxy for the extent to which the future performance of a company depends on risk assets. It can be argued that an increase in the percentage of intangible assets may affect human capital (as an intangible asset).

The role of human capital is important in contributing to the success of the company and requires human capital to continue to innovate to create value added for the company. Meressa (2016) found that there was a negative and significant relationship between bank and IC risk. A risky bank can create doubts in the minds of investors and other customers. Therefore, the higher the value of risk in the bank will result in lower trust from investors, greater potential failure and reduce

stakeholder loyalty that will destroy the reputation of the bank and will decrease the performance of IC

III. RESEARCH METHODS

3.1. Emperical Model

The model in this study adapts the research by El-Bannany (2008), which examine the impact of bank efficiency, barriers to entry, efficiency of investment in IC, bank profitability and bank risk on IC. The purpose of this paper is to investigate the determinants of IC performance banks in Indonesia over the period 2001-2015. I divided the focus of research on three samples of government-owned banks, foreign-owned banks and domestic-owned banks. This division is to capture the more specific impact of determinants of bank ICs in Indonesia are operationally presented in Table 1. The research model as follow:

$$VAIC_{i,t} = \alpha + \beta_1 VAIC_{,t-1} + \beta_2 FASS_{,t} + \beta_3 EFI_{i,t} + \beta_4 PROF_{i,t} + \beta_5 RISK_{i,t} + \varepsilon_{i,t}$$

3.2. Variable Selection

The dependent variables in this paper are the value added IC (VAIC) method explained by Public (1998) and El-Bannany (2012) will be used to measure the IC performance, which refer to the individual bank and t refers to the time of the year. Variable dependen in this study are bank efficiency, barriers to entry, efficiency of investment in IC, bank profitability and bank risk. Operationally the variables in Table 1 as follow:

Table 1
Description of the variables used in the regression models

Variable	Measure	Expected effect
Dependen Variable		
VAIC™	The value added IC (VAIC) method explained by Public (1998) and El-Bannany (2012) will be used to measure the IC 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})	
	$VAIC^{TM}$ = $VAHU_{it}$ + $STVA_{it}$ + $VACA_{it}$	
Independen Variable		
FASSit	Barriers to entry (The ratio of fixed assets to total assets for bank i in year t)	-
EFIit	Efficiency of investment in IC (The ratio of staff costs to total revenue for bank i in year t)	+
PROFit	Bank profitability (Individual bank i annual net profit before taxation divided by shareholders equity in year t)	+
RISKit	Bank risk in terms of the ratio of intangible assets to total assets	-
α	constants	
$\beta_1 - \beta_5$	the regression coefficient	
ε_{it}	residual value (*error*)	

3.3. Data and Tool

The data used are secondary data in the form of banks financial statements that published by Bank Indonesia. The analysis tools used in this study is dynamic panel (GMM method). I 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.

Table 4 reports the empirical results of investigate the determinants of IC performance banks in Indonesia over the period 2001-2015. I divided the focus of research on three samples of government-owned banks, foreign-owned banks and domestic-owned banks.

Table 2
Descriptive statistics

Variable	Mean	Std. Dev	Minimum	Maximum	Obs.
All Sample					
VAIC	3.664828	2.725616	-18.58181	25.4827	1020
FASS	0.025805	0.022752	0.000451	0.22095	1020
EFI	0.169365	0.088200	0.014464	1.28120	1020
RISK	2.588307	1.668936	-5.970835	11.4634	1020
PROF	14.96965	11.74638	-56.23000	68.0900	1020
Governance					
VAIC	3.469439	0.849362	0.354576	6.54742	350
FASS	0.023501	0.009678	0.000451	0.08258	350
EFI	0.193450	0.053430	0.084834	0.35739	350
RISK	3.277631	1.289174	-0.397660	7.53341	350
PROF	24.99123	10.13448	-8.020000	68.0900	350
Foreign					
VAIC	5.702338	4.523815	-18.58181	25.4827	240
FASS	0.012969	0.017180	0.001363	0.21636	240
EFI	0.111637	0.060563	0.014464	0.37762	240
RISK	2.963989	2.049353	-5.034780	11.4634	240
PROF	10.64112	9.097236	-56.23000	42.0000	240
Domestic					
VAIC	2.711097	1.534310	-5.092400	12.4655	440
FASS	0.034585	0.028221	0.002180	0.22095	440
EFI	0.180424	0.107112	0.040300	1.28120	440
RISK	1.834639	1.369837	-5.970835	8.94138	440
PROF	9.301196	8.516950	-25.09000	57.9800	440

Table 3
Correlation Matrix for the Explanatory Variables

All Sample					*Foreign*				
	FASS	*EFI*	*RISK*	*PROF*		*FASS*	*EFI*	*RISK*	*PROF*
FASS	1.0000				FASS	1.0000			
EFI	0.3080	1.0000			EFI	0.1877	1.0000		
RISK	-0.1454	-0.1770	1.0000		RISK	-0.1049	-0.4193	1.0000	
PROF	-0.1901	-0.0191	0.6532	1.0000	PROF	-0.1275	-0.3581	0.7526	1.0000

Governance					*Domestic*				
	FASS	*EFI*	*RISK*	*PROF*		*FASS*	*EFI*	*RISK*	*PROF*
FASS	1.0000				FASS	1.0000			
EFI	0.2247	1.0000			EFI	0.2592	1.0000		
RISK	-0.0174	0.1268	1.0000		RISK	-0.0065	-0.2182	1.0000	
PROF	-0.2382	0.0380	0.5958	1.0000	PROF	-0.2143	-0.2390	0.6184	1.0000

Table 4
GMM estimation

Explanator Variables	*All Sample*		*Governance*		*Foreign*		*Domestic*	
	Coefficient	*z*	*Coefficients*	*z*	*Coefficients*	*z*	*Coefficients*	*z*
VAIC$_{t-1}$	0.1477688***	3.81	0.2821005***	4.55	0.108377	1.40	0. 2775796***	4.67
FASS	-6.71541	-1.06	9.25204	1.48	-16.00937	-0.87	-8.584146**	-2.12
EFI	-7.721794***	-5.58	-7.905187***	-7.09	-8.92389	-1.19	-7.569601***	-10.56
RISK	0.5719802***	5.79	0.217003***	3.86	0.8513147***	3.07	0.3694657***	4.60
PROF	0.0243414	1.58	0.020844***	3.67	0.0260432	0.40	0.0476666***	3.96
Obs.	1020		350		240		440	
Wald Test	188.77		194.34		38.78		342.74	
Sargan Test[1]	206.9017		103.3891		65.85445		59.74959	
AR (1)[2]	-13.764		-6.2959		-6.8212		-5.8883	
	0.0000		0.0000		0.0000		0.0000	
AR (2)[3]	-.21847		0.78329		-0.46574		-1.9325	
	0.8271		0. 4335		0.6414		0.0533	

*,**, 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)

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 VAIC is statistically significant across all models, indicating the dynamic character of model specification of VAIC banks in Indonesia. In other words, VAIC of banks in Indonesia are a high degree of persistence of bank profitability and justifying the use of a dynamic model.

Barriers to entry variables significantly negatively affect intellectual capital in banks in Indonesia, especially in domestic banks in Indonesia. The results of this study are in accordance with expectations and research conducted by El-Bannany (2008), El-Bannany (2008) and Depoers (2000) who found a negative influence of barriers to entry against IC.But the overall sample found no significant negative effects of barriers to entry against IC. Not significant happened because the number of policies that protect the bank so that the potential entry of competitors is low. The results of this study are supported by research conducted by Bannany (2012) which states the entrance barriers have no significant negative effect on Intellectual capital because the entry of new competitors will certainly affect the cost of ownership. Barriers to entry can protect companies from entry of new competitors and reduce ownership costs.

Variable the efficiency of investment in IC has a significant negative effect on intellectual capital in banks in Indonesia, especially in state-owned and domestic banks in Indonesia. The results of this study differ from expectations and research conducted by Kannan and Aulbur (2004) who found a positive effect of efficiency on IC.Great negative research results indicate that when the investment contribution increases on value creation it will make human capital is not motivated to continue innovation so that making the intellectual capital performance to decline.

The study found a positive and significant bank risk on intellectual capital in all samples of banks in Indonesia. The results of this study are different from the hypothesis that the bank risk is negative to intellectual capital. Positive results are significant because the high risk assets value of some banks will motivate human capital as a

component of intellectual capital to improve its performance in managing intangible assets to measure the extent to which the future performance of banking companies in risky assets, so that the performance of intellectual capital also increases. this is in line with the results of research conducted by El-Bannany (2008) which states that some banks that have high risk value will be better in terms of intellectual capital than banks whose risk is low because more risky companies will seek to minimize the negative effects of bank risk.

Profitability has a positive and significant sign on the IC especially in state-owned and domestic banks in Indonesia. The results of the study are in line with the hypothesis that bank profitability has significant positive effect on IC and previous study by El-Bannany (2012), Ousama, et al (2012) and Mondal and Gosh (2014). In other words, the profitability of banks in Indonesia will increase maximally from companies that are intellectual intensive, where companies are more intensive use of human capital intelligence so that banking companies are required to be able to utilize and manage the source of intellectual capital owned (human capital, structural capital and costumer capital) effectively and efficiently.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusion

The purpose of this paper is to investigate the determinants of IC performance banks in Indonesia over the period 2006-2015. I divided the focus of research on three samples of government-owned banks, foreign-owned banks and domestic-owned banks. The analysis tools used in this study is the generalized method of moments. Barriers to entry variables significantly negatively affect intellectual capital in banks in Indonesia, especially in domestic banks in Indonesia. Variable the efficiency of investment in IC has a significant negative effect on intellectual capital in banks in Indonesia, especially in state-owned and domestic banks in Indonesia. The study found a positive and significant bank risk on intellectual capital in all samples of banks in Indonesia. Profitability has a positive and significant sign on the IC especially in state-owned and domestic banks in Indonesia.

5.2. Recomendation

Companies should increase the barriers to entry such as product differentiation by motivating employees to continue to innovate so that companies are more protected from the entry of new competitors and able to improve intellectual capital performance. In the condition of companies whose investments are efficient, companies should be able to motivate human capital to continue innovation in maintaining investment efficiency in intellectual capital companies continue to increase.

BIBLIOGRAPHY

Al-Ali, N. (2003). *Comprehensive Intellectual Capital Management*. John Wiley and Sons, Inc. Canada: John Wiley and Sons, Inc.

Arellano, M., & Bond, S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *The Review of Economic Studies*, 58(2), 277. https://doi.org/10.2307/2297968

Chatzkel, J. (2002). *Intellectual Capital*. United Kingdom: Capstone Publishing (a Wiley company).

Depoers, F. (2000). A cost benefit study of voluntary disclosure: some empirical evidence from French listed companies. *European Accounting Review*, 9(2), 245–263. https://doi.org/10.1080/09638180050129891

Kannan, G., & Aulbur, W. G. (2004). Intellectual Capital.: Measurement effectiveness. *Journal of Intellectual Capital,* 5(3), 389–413. *https://doi.org/10.1108/14691930410550363*

El Bannany, M. (2008). A study of determinants of Intellectual Capital performance in banks: the UK case. *Journal of Intellectual Capital*, 9(3), 487–498. https://doi.org/10.1108/14691930810892045

El-Bannany, Magdi. 2012. Global financial crisis and the IC performance of UAE banks. *Journal of Human Resource Costing & Accounting*, 16 (1): 20 – 36.

Marr, B. and S. (2003). *Valuation of Intellectual Capital and Real Option Models*. Research Fellow in the Centre for Business Performance. Cranfield University.

Meressa, Hayelom Abrha. 2016. Determinants of Intellectual Capital Performance: Empirical Evidence from Ethiopian Banks. *Research Journal of Finance and Accounting*. 7(13): 10-19.

Mondal, Amitava and Santanu Kumar Ghosh. 2012. Intellectual Capital And Financial Performance of Indian Banks. *Journal of IC* 13 (4): 515-530.

Ousama, Abdulrahman Anam, Abdul-Hamid Fatimah dan Abdul Rashid Hafiz-Majdi. 2012. Determinants of Intellectual Capital reporting, *Journal of Accounting in Emerging Economies*, 2 (2): 119 – 139

Patton, J., & Zelenka, I. (1997). An empirical analysis of the determinants of the extent of disclosure in annual reports of joint stock companies in the Czech Republic. *European Accounting Review*, 6(4), 605-626

Penrose, E. (1959). *The Theory of The Growing of the Firm*. Oxford, University Press, 301.

Pulic, Ante. 1998. Measuring the Performance of Intellectual Potentialin Knowledge Economy. Paper presented in 1998at the 2nd McMaster World Congress on Measuring and Managing Intellectual Capital by the Austrian Team for Intellectual Potential

Sawarjuwono, Tjiptohadi dan Agustine Prihatin Kadir. 2003. Intellectual Capital: Perlakuan, Pengukuran, dan Pelaporan (Sebuah Library Research). *Jurnal Akuntansi dan Keuangan* 5 (1): 35-57

Stewart, Thomas. 1998. Intellectual Capital: The new wealth of organizations. Article in Performance Improvement

Stovel, M. and Bontis, N. (2002) Voluntary Turnover: Knowledge Management—Friend or Foe? *Journal of Intellectual Capital*, 3, 303-322. *http://dx.doi.org/10.1108/14691930210435633*