THE EFFECT OF INTELLECTUAL CAPITAL TOWARDS FIRM FINANCIAL PERFORMANCE: STUDY IN HIGH-TECH FIRMS IN INDONESIA AND MALAYSIA

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Abstract

Intellectual Capital (IC) is important because firms in ASEAN needs a lot of competitive advantage, mainly from IC, in order to compete in the era of ASEAN Economics Community (AEC). This study investigates the role of intellectual capital in affecting the firm financial performance. The data collected from annual report from high-tech industries and conducted on two ASEAN countries, namely Indonesia and Malaysia. The final sample used in this study consists of a total of 619 observations. This study uses panel data regression model analysis, i.e. fixed effect regression and random effect regression. The results showed that intellectual capital has a positive effect on financial performance in Indonesia and Malaysia. This result indicate that intellectual capital can give higher financial performance for the firms.

I. Introduction

ASEAN economic community (AEC) will force regional economic integration between the members of ASEAN countries. This is challenging for the company in order to continue to survive for the sake of business continuity. According to Sawarjuwono and Kadir (2003), in order to survive in accordance with the concept of going concern, companies must quickly change their strategy from labor-based business to knowledge based business. The paradigm will make companies to improve company ability in processing the resources they have to create corporate value as a competitive advantage. One of them is by increasing the company's intellectual capital. Intellectual capital in the company is a knowledge resource based on the employees, customers, processes, and technologies used by companies in value creation (Bukh et al, 2005).

Resource-based theory (RBT) explains that intellectual capital (IC) is a resource that serves as the core of value creation and competitive advantage for firms (Barney, 1991). The growth and sustainability of companies will depend on the development of the company
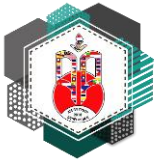
resources, as explained by RBT perspectives. Previous research by Pratama (2016) have already examine the effect of Intellectual Capital towards Firm Performance in Indonesia. The study prove that effective and efficient use of IC will encourage the company's ability to generate profit. Therefore, this study will try to develop the research by Pratama (2016) by further examining the role of Intellectual Capital and financial performance of the company in Indonesia, plus another ASEAN country, namely Malaysia.

This research uses Value Added Intellectual Coefficient (VAIC) method developed by Pulic (2000, 2004) to measure IC using a monetary measurement. Companies engaged in high-tech industries have been well known as companies that tend to rely on IC in their operations, so it is suitable for this study. This study uses panel data regression model (i.e. fixed effect and random effect regression). This study contributes to the literature of IC by developing the research from Pratama (2016) by testing the positive effect of IC towards financial performance of high-technology companies in Indonesia and Malaysia, as representatives of ASEAN.

II.   Literature Review and Hypotheses Development
Resource-based Theory (RBT)

RBT provides an important framework to explain and predict what can be an underlying for competitive advantage and firm performance (Barney et al., 2011). Resource Based Theory is a thought that developed in strategic management theory and competitive advantage of companies which believe that the company will achieve excellence if it has excellent resources (Solikhah et al, 2010). Companies will be able to win the competition and also create value added so that it will contribute to the firm's success by utilizing sustainable competitive advantages from IC (Chen et al., 2005 and Wang, 2008). In relation to this research, Resource Based Theory explains that companies which have intellectual capital will be able to create competitive advantage, so that it will improve the company's financial performance.

Intellectual Capital and Firm Performance

Resource-based theory (RBT) explains that intellectual capital (IC) is a resource that serve as the core of value creation and competitive advantage for firm (Barney, 1991). It can be said that IC perform an important role in value creation and sustainable growth of the firm. From the RBT perspective, the firm ability to maintain asset resources that are valuable, rare and irreplaceable and also allocating and deploying these resources effectively is closely related to the creation of a sustainable competitive advantage (Barney, 1991). Due to competitive advantage of intellectual capital, it is expected to increase sales and use of the company's resources efficiently and effectively which can make an increase in the company's profit. Based on above explanation, the hypotheses proposed in this study are as follows:

H1: Intellectual capital has positive effect on the firm financial performance of high-technology firms in Indonesia.

H2: Intellectual capital has positive effect on the firm financial performance of high-technology firms in Malaysia.
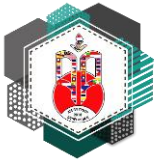
III. Research Method

Sample

The sample in this study was obtained from firm's annual reports. The sample of this study are the firms engaged in high technology industries. This study conducted on two ASEAN countries namely Indonesia and Malaysia. The type of industry that is considered as high-technology industry refers to the industrial classification based on the Standard Industrial Classification (SIC).

Due to incomplete data on the variables selected, the final sample used in this study is amounted to 56 firms with a total of 619 firm-year observations during 2008-2014. Table 1 shows the final sample used and its distribution by country and industry.

Table 1. Sample Distribution by Countries and Industries

Panel A: Distribution by Countries		
Country Name	Number of Firm	Number of Observation
Indonesia (IN)	31	144
Malaysia (ML)	115	475
Total sample	146	619

Panel B : Distribution by Industries			
Industries	IN	ML	*Total Sample*
Communications	18	14	32
Electronic and other electrical equipment	2	47	49
Computer hardware	1	2	3
Computer software	9	45	54
Photographic, optic and medical equipment	1	7	8
Total	31	115	146

Variables

a. Independent Variable

- **Intellectual Capital (VAIC)**. IC measured using VAIC which was developed by Pulic (2000, 2004). VAIC measured by the following equation:

$$VAIC_t = HCE_t + SCE_t + CEE_t$$

Where:

$VAIC_t$ = Value added intellectual coefficient at t

HCE_t = VA_t / HC_t; human capital efficiency coefficient at t

SCE_t = SC_t / VA_t; structural capital efficiency coefficient at t

CEE_t = VA_t / CE_t; capital employed efficiency coefficient at t
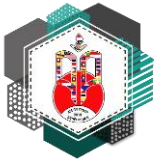
VA_t	$= OUT_t - IN_t = OP_t + EC_t + D_t + A_t$; VA is the calculation of output (OUT_t) reduced by Input (IN_t); or it could be the calculation of operating income (OP_t); employee costs (EC_t); depreciation (D_t); and amortization (A_t)
HC_t	= total salaries and wages at t
SC_t	$= VA_t - HC_t$; structural capital at t
CE_t	= book value of the net assets at t

- **Human Capital Efficiency (HCE)**. The efficiency of human capital or the ability to apply the skills and expertise efficiently is represented by HCE (Pulic, 2000, 2004).
- **Structural Capital Efficiency (SCE)**. The efficiency of structural capital and relational capital is represented by SCE (Pulic, 2000, 2004).
- **Capital Employed Efficiency (CEE)**. The efficient use of physical and financial capital is represented by CEE (Pulic, 2000, 2004).

b. Dependent Variable
- **Firm Performance (Firm_Perf)**. Same with the study from Pratama (2016), the firm performance is measured by using financial performance. The financial performance is measured by ROA (return on assets ratio) and can be calculated by the following equation: **ROA =** *Profit before tax / Average total assets*.

c. Control Variable
- **Firm Size (FSize)**. Firm size is measured by using firm's total assets at year t, then calculated the natural logarithm.
- **Leverage (Lev)**. Leverage is calculated by dividing long-term liabilities to total assets.

Regression Model

This study uses panel data regression model analysis, namely fixed effect or random effect regression. Before testing the regression analysis, the Hausman test is conducted to find out which is the most suitable panel data regression model between fixed effect or random effect regression.

The hypotheses testing in this study were using one equation model. Model (1) was used to examine the positive relationship between IC and financial performance both in Indonesia and Malaysia. The equation models used to test all of the hypotheses in this study are as follows:

Model 1. The Effect of VAIC on Financial Performance

$$ROA = \beta_0 + \beta_1 VAIC + \beta_2 FSize_t + \beta_3 Lev_t + \beta_4 Year_t + \varepsilon_t$$

Where:

ROA	= Financial performance
MB	= Market performance
VAIC	= Intellectual Capital
FSize	= Firm Size
Lev	= Leverage

ε_t = error term

IV.   Results and Discussions

Descriptive Statistics

Table 2 shows the descriptive statistics of the selected variables in this study. ROA has a mean value of 0,1100 and 0,10227 for Indonesia and Malaysia respectively which indicates that the firms have a fairly good profitability. Meanwhile, VAIC which is the proxy of the firm's intellectual capital has a mean value of 8,0824 and 5,1660 for Indonesia and Malaysia respectively. Overall, the descriptive statistics of each variable can be seen in Table 2 below.

Table 2. Descriptive Statistics of Selected Variables

Indonesia				
Variable	**Minimum**	**Maximum**	**Mean**	**Std. Dev.**
ROA	0.0010	0.8940	0.1100	0.1200
VAIC	1.7129	51.8033	8.0824	6.9931
FSize	7.3985	16.2630	12.3579	2.1230
Total Assets	1633.48	11558795.67	1198687.69	2422921.85
Lev	0.0000	0.7180	0.2140	0.1805

Malaysia				
Variable	**Minimum**	**Maximum**	**Mean**	**Std. Dev.**
ROA	0	0,637	0,1022674	0,0912227
VAIC	1,473109	68,9657	5,166008	5,471373
FSize	7,599614	16,4586	11,00378	1,698122
Total Assets	1997,42	14100000	600355,5	2158828
Lev	0	0,682	0,0966947	0,1302354

Hypotheses Testing

Hypotheses 1 testing of the study aims to test the Hypothesis 1 which stated that Intellectual capital has positive effect on the firm financial performance of high-technology firms in Indonesia. While, Hypotheses 2 testing of the study aims to test the Hypothesis 2 which stated that Intellectual capital has positive effect on the firm financial performance of high-technology firms in Malaysia.

Table 3 showed the results of overall hypothesis testing in this study. The result showed that VAIC has a significant positive effect on ROA or firm financial performance with a coefficient amounted to 0,01854 at a significance level of 5 percent for Indonesian Hi-Tech companies and a coefficient amounted to 0,0037137 at a significance level of 5 percent for Malaysian Hi-Tech companies. This indicates that if a firm can use its IC more efficiently, it can lead to improved financial performance of the firm. Therefore, hypothesis 1 and 2 which

states that intellectual capital has positive effect on the firm financial performance of high-technology firms in Indonesia and Malaysia is supported.

The result indicates that efficient and effective use of IC will lead the firm to achieve higher financial performance. The result of this study is consistent with previous studies conducted by Pratama and Wibowo (2017) which found that intellectual capital is positively related to ROA which is the proxy of firm financial performance.

Table 3. Hypothesis Testing

| Independent Variable	Dependent Variable	
	Indonesia	**Malaysia**
	ROA	**ROA**
Const	1,33530	-0,1388555
	(2,74)**	(-0,78)
VAIC	0,01854	0,0037137
	(3,61)**	(2,76)**
FSize	-0,11905	0,0218942
	(-2,71)**	(1,28)
Lev	-0,04777	-0,1962921
	(-2,23)	(-3,78)***
R² Within	0,4844	0,0722
F	1789,81	46,72
Prob > F	0,0000	0,0001

Notes: *** indicates significant at the 1%; ** indicates significant at the 5%; * indicates significant at the 10%

V.   Conclusions, Limitations, and Suggestions

The objective of this study is to examine the positive effect of IC on the financial performance of the firms operating in high-technology industry in ASEAN. The empirical results showed that intellectual capital has a positive effect on firm financial performance, both in Indonesia and Malaysia. This indicates that efficient and effective use of intellectual capital will make the firm achieve higher financial performance. This result is consistent with the result from Pratama (2016). This implies that hi-tech firms should maximize and manage their Intellectual Capital as good as possible, so that the Intellectual Capital could be maximize to enhance firms financial performance.

This study has several limitations. First, the results of this study may not be generalizable to the firms with various sorts of business because this study only include high-tech companies. Further research can use various other firms from various industries and contrasted them in order to determine the complete picture of relationship between intellectual capital and firm
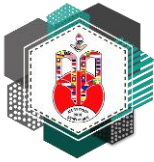
performance from the viewpoint of a more comprehensive range of industries. Second, this study uses VAIC which is a measurement of intellectual capital from accounting information of the firm. Further research can use another proxy for estimating company intellectual capital by combining measurements of intellectual capital using monetary and non-monetary methods.

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