



The Impact of Intellectual Capital on a Firm's Stock Return: Evidence from Indonesia

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ABSTRACT

The objective of this paper is to understand the impact of intellectual capital on firm's stock return. The increasing importance of intellectual capital that generates more value is beneficial both for managers and investors at large. The banking sector in Indonesia is chosen as the data sample for this research. Intellectual capital is measured by VAICTM, a method developed by Prof. Dr. Ante Pulic. This method allows the quantification of intellectual capital and the categorization of its elements into 'human capital efficiency', 'structural capital efficiency' and 'capital employed efficiency', which also enables to get more insight of their effects. The regression models explore the relationship between current and future stock returns and intellectual capital and its constituents. The findings show that intellectual capital does not affect the current stock return, but it however contributes to stock return growth. Only one element of intellectual capital affects the stock return. The results may indicate that changes of stock returns are mostly determined by external factors such as inflation, exchange rate and socio-economic conditions. This paper focuses on the nature of the Indonesia stock market which prefers short term profit gained by a company rather than long term sustainable growth which indeed undermines intellectual capital.

Keywords - Intellectual Capital, Stock Return, Banking.

INTRODUCTION

The 'knowledge-based economy' views knowledge as an important factor that distinguishes a firm's capability to create a sustainable competitive advantage in the market. The concept of evaluating firms' assets gradually shifted from the traditional perspective that focused only on the tangible value of assets to the new approach which values intangible knowledge development and integration ability. Both elements of the new approach will determine a firm's human, structural, and customer capitals (Shih, Chang & Lin, 2010).

Research related to intellectual capital started to develop based on the significant difference between firms' market value and book value. Traditional financial reporting that only covered the value of tangible assets and ignoring intangible assets underestimated the true value of the firms (Goh, 2005). The difference in market value and book value is filled up by firms' intellectual capital. With good intellectual capital management, the

firms could strive for a more competitive advantage through enhancing value creation efficiency from human creativity, the firms' operational structure and customer-supplier relationship (Latif, Malik & Aslam, 2012).

The Indonesian banking sector is chosen as a data sample for this research because it is considered as one of the knowledge-based industries. The banking sector also provided reliable financial statements and its personnel are chosen for their intellect (Mavridis & Kyrmizoglou, 2005). In Kuwait, the banking sector is considered as the most advanced sector based on the human resources employed and the quality of management training (Abdulsalam, Al-Qaheri & Al-Khayyat, 2010). In Indonesia, the banking industry is very important for the Indonesian economy because banks play a role in enhancing economic growth through small and medium enterprise micro-lending (Sianipar, 2012).

This research paper will contribute to enhance the potential of intellectual capital by designing strategies to improve efficiency and the value creation process in banking and other industries. Another contribution of this paper is as an insight for investors and managers into intellectual capital as a potential source of competitive advantage, which will be very valuable in times of fierce competition in the industry. The rest of this paper is organized as follows. Section 2 introduces the literature review of the theoretical foundations of intellectual capital. The research methodology, sample selection and measurement of variables are described in section three. Section 4 presents the findings of the empirical analysis and the conclusion will appear in the final section.

LITERATURE REVIEW

Growing interest in research about intellectual capital helped to broaden its definition. Several definitions of intellectual capital categorized it as similar to intangible assets. According to Stewart (1997), intellectual capital is the collection of knowledge, experience, information and intellectual property that can be used by the company to generate future benefits (as cited in Bontis, Keow & Richardson, 2000).

According to Bontis (1998), intellectual capital is the effectiveness of the knowledge usage such as (finished products as opposed to information such as raw material. Mavridis & Kyrmizoglou (2005) described intellectual capital as an intangible or invisible driver that creates intangible goods and competitive advantage and lastly real common tangible assets. According to Sullivan (2000), intellectual capital represents all resources that reflected the value for the firms to increase competitiveness (Sullivan, 2000).

Thus, this research assumes that intellectual capital could be defined as all non-physical resources that firms utilize to generate profit and value. Roos, Pike & Fernstrom (2005) went further and stated that intellectual capital could be divided into three categories: human capital, organizational/structural capital, and relational/customer capital.

Human capital refers to a firm's human resources that possess tacit knowledge that is useful for a firm's productive process in transforming information received from environment into useful output for the firm. According to Liu (2009), human capital is embedded in the human resources of the company and can be developed through training and education. This knowledge cannot be separated from the individuals thus this capital is not owned by the firms.

Organizational/Structural Capital is the firms' infrastructure that helped to transform employees' ideas, innovations and creations into valuable monetary form. Structural capital comprises firms' information systems, organizational structure and policies, strategies and databases. Developments such as structural components are possible to reduce costs and enhance profitability (Mondal & Ghosh, 2012). Bernadette (2000) claimed that structural capital includes all assets and values that would remain in the firm if all the employees left the firm. Thus it is very important as the only assets that are truly owned by the firms. In addition, Bontis (1998) also stated that structural capital supports employees in their effort to achieve maximum intellectual performance. Therefore, both human capital and structural capital support each other in the process of developing value for the firms.

Relational capital includes all the firms' relationships with customers, suppliers, intermediaries, representatives, partners, owners and lenders Roos, Pike & Fernstrom (2005). Building relational capital through loyalty programs for customers, sales rewards for intermediaries and prompt payment to suppliers will contribute much to a firm's value because it increases third party loyalty to the firm. That loyalty transforms into additional promotion or brand image that is attached to the firms.

Regarded as a complex issue, intellectual capital is difficult to conceptualize (Stahle, Stahle & Aho, 2011). Consistently, there have been numerous developments on how to measure it. One of the most common

measurements for intellectual capital, called the Value Added Intellectual Coefficient (VAIC), was developed by Ante Pulic. Firer and Williams (2003) stated that VAICTM is an analytical procedure that enabled management and stakeholders to monitor and evaluate the effectiveness of value added by each firm's resource components. Pulic divided VAICTM into three separate inputs of value creation efficiency that sum up the firm's intellectual capital: capital employed efficiency (CEE), human capital efficiency (HCE), and structural capital efficiency (SCE). The higher the value of VAICTM, the better the management is in utilizing the potential resources employed to create value for the firm.

Intellectual capital plays an important role in several business sectors which rely heavily on research and development or human capital for their survival. In most research on intellectual capital, the banking sector is most commonly chosen as a sample. The banking sector is very crucial for intellectual capital research because of the nature of the banking sector personnel-intensive approach. Banking sector implements standardized and regulated education backgrounds for their employees and it also instigates standardized financial reports as regulated by the central bank. Furthermore, banking plays an important role in supporting and enhancing a country's economy.

In Pakistan, Malik, Aslam & Latif (2012) found that HCE is the main predictor of corporate performance in Islamic Banks while CEE was the main predictor of corporate performance in conventional banks. Mavridis & Kyrmozoglou (2005) found that there is a normal positive and significant relationship between intellectual capital and banks' performance. However in India, other research found that intellectual capital is an important determinant of banks' profitability and productivity (Mondal & Ghosh, 2012). In Thailand, Appuhami (2007) proved in his empirical research into Thailand's banking, finance & insurance sectors that there is a significant positive relationship between firms' intellectual capital and investors' capital gain on shares. A study of intellectual capital in Indonesia found that intellectual capital has a positive impact on banks' current year performance and future performance (Ulum, Ghozali & Chariri, 2009). On the contrary, Sianipar (2012) demonstrated that IC has insignificant impact on banks' profitability when measured by return on assets (ROA) and return on equity (ROE).

METHODOLOGY

The data used in this paper consist of 25 banks listed in the Indonesian Stock Exchange (IDX) for the time period of 2005 to 2009. This research used secondary data collected from annual financial reports. The banking sector is chosen because it is considered as more representative of intangible assets. The sample from one sector also serves for the purpose of homogeneity of data.

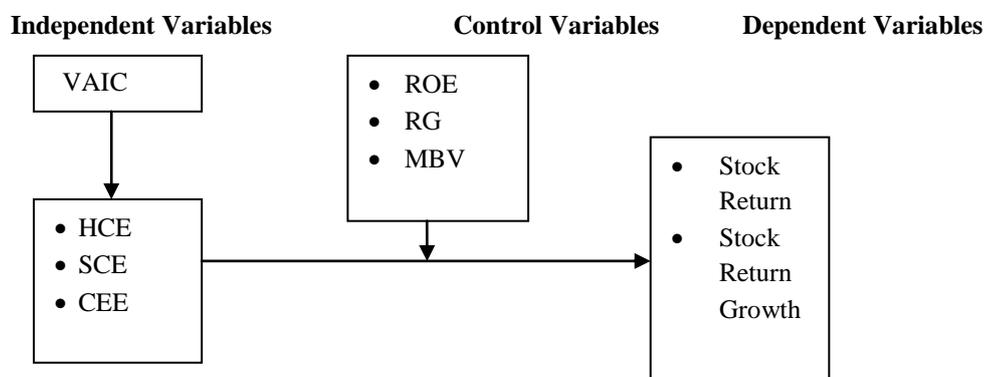
The purpose of this paper is to analyze the impact of intellectual capital on firms' stock return based on the evidence from the banking sector in Indonesia. Thus, the research questions are as follows:

Does intellectual capital impact the firm's current stock return?

Does intellectual capital impact the firm's stock return growth?

Do the components of intellectual capital affect the firm's financial performance?

Figure 1: VAIC and financial performance



VAIC - Value Added Intellectual Coefficient; CEE - Capital Employed Efficiency; HCE - Human Capital Efficiency
SCE - Structural Capital Efficiency; ROE - Return on Equity; MBV - Market to Book Value; RG - Stock Return Growth

This research has two dependent variables: stock return (SR) and stock return growth (SR_{t+1}).

$$\text{Stock Return Growth} = \frac{SR_t - SR_{t-1}}{SR_{t-1}} \times 100\%$$

Where, SR_t : Stock Return from year t and SR_{t-1} : Stock Return from year t-1

Siegel (2002) stated that the two main sources for the return of owned stocks are dividend payouts and capital gains (as cited in Tan, Plowman & Hancock, (2007)). They found that there is positive relationship between intellectual capital and stock return.

Future performance of firms could be determined by several different indicators. In this research, the authors used stock return growth. Chen, Cheng & Hwang, (2005) found that firms with greater intellectual capital had better profitability and revenue growth. Because profitability and revenue growth indicate good performance, investors will have confidence in the firms. Therefore it is expected that the stock price will increase in the market and stock return will grow.

One of the independent variables is intellectual capital, which is measured by VAIC and its components SCE, HCE, and CEE. The model also includes control variables such as Return on Equity (ROE), Revenue Growth (RG) and Market to Book Value Ratio (MBV).

Intellectual capital is measured using Pulic's Value Added Intellectual Coefficient (VAICTM) method. According to the VAICTM method, intellectual capital value comes from the sum of value added by capital employed efficiency (CEE), human capital efficiency (HCE), and structural capital efficiency (SCE).

$$VAIC^{TM} = CEE + HCE + SCE$$

Human capital comprises knowledge and information possessed by human resources. However, the firms must be able to convert this knowledge and information into valuable assets that contribute in the value creation process. In case the conversion failed because the firms were not able to manage them, knowledge and information become useless for them (Abdulsalam, Al-Qaheri & Al-Khayyat (2010).

$$HCE = \frac{VA}{HC}, \text{ where, } VA = \text{Total value added; } HC = \text{Total wages and salaries expense}$$

Structural capital consists of other capital owned by the firm contributes to the generation of ideas from employees, innovation of new products. According to Liu (2009), by properly managing of those ideas, the firm could turn them into currency value for the business. He further pointed out that structural capital supported human capital in order to enhance the firms' performance.

$$SC = VA - HC, \text{ where, } VA = \text{Total value added; } HC = \text{Total wages and salaries expense}$$

The other component of intellectual capital (VAICTM) is capital employed efficiency of the firms. Capital employed efficiency indicates the value added gained by the firms from the net book value of assets. Firer and Williams (2003) revealed that South African firms put more emphasis on utilizing physical assets to gain higher returns.

$$SCE = \frac{SC}{VA}, \text{ where, } SC = \text{Structural capital; } VA = \text{Total value added}$$

The control variables, ROE, MBV, and RG are also expected to affect a firm's stock return.

$$ROE = \frac{\text{Net Income}}{\text{Total Shareholders' Equity}}$$

$$RG = \frac{\text{Current year revenue} - 1}{\text{Previous year revenue}} \times 100\%$$

$$MBV = \frac{(\text{Number of stocks outstanding} \times \text{Market Price})}{\text{Book value of shareholders' equity}}$$

From previous researches, according to Tan, Plowman & Hancock (2007), there is a positive relationship between intellectual capital and stock return. In addition, Chen, Cheng & Hwang (2005) found that firms with greater intellectual capital had better profitability and revenue growth. Human capital comprises knowledge and information possessed by human resources. However, the firms must be able to convert that knowledge and information into a valuable asset that contributes in the value creation process. Otherwise, that knowledge and information becomes useless if the firms were not capable of managing them (Abdulsalam, Al-Qaheri & Al-Khayyat (2010). Structural Capital consists of other capital owned by the firm beside human capital and those capitals are used to generate ideas from employees, innovation of new products, and manage those ideas into currency value for the firms (Liu, 2009). Firer and Williams (2003) found out that South African firms which put more emphasis on utilizing physical assets will have a higher valuation.

Based on the research questions, the following hypotheses are developed:

H1: Intellectual capital positively affects stock return

H2: Intellectual capital positively affects stock return growth

H3: There is a positive relationship between Human Capital Efficiency and stock return

H4: There is positive relationship between Structural Capital Efficiency and stock return

H5: There is positive relationship between Capital Employed Efficiency and stock return

For the multiple regression analysis, three regression models will be used to test each of the five hypotheses. Model 1 is to test whether IC influences stock return contemporaneously and model 2 for stock return growth, while the last model investigates whether VAIC elements affect stock return.

$$\text{Model 1 : } SR = b_0 + b_1 (\text{VAIC}) + b_2 (\text{ROE}) + b_3 (\text{RG}) + b_4 (\text{MBV}) + \varepsilon$$

$$\text{Model 2 : } SR_{t+1} = b_0 + b_1 (\text{VAIC}) + b_2 (\text{ROE}) + b_3 (\text{RG}) + b_4 (\text{MBV}) + \varepsilon$$

$$\text{Model 3 : } SR = b_0 + b_1 (\text{CEE}) + b_2 (\text{HCE}) + b_3 (\text{SCE}) + b_4 (\text{ROE}) + b_5 (\text{RG}) + b_6 (\text{MBV}) + \varepsilon$$

FINDINGS AND DISCUSSION

Table 1 describes the minimum, maximum, mean and standard deviation of the sample. From the mean, VAIC and HCE have a significant contribution to the firms' creation of value. HCE also has the highest value compared to other components of VAICTM because banking as a service industry relies heavily on their personnel to provide service to the customers. Most of the sample has a positive value for VAIC. That could mean that most of them could generate enough value to cover the cost of human capital, structural capital and capital employed.

Table 1. Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
SR	175	-32.082	115.197	19.697	32.225
	175	-	3,129.165	1,144.	735.161
SR _{t+1}		4,325.78		188	
CEE	175	0.1067	2.953	0.3611	0.3658
HCE	175	-5.639	29.449	3.254	4.784
SCE	175	-1.018	1.177	0.5579	0.2511
VAIC	175	-1.509	30.607	4.173	4.818
ROE	175	-35.141	288.837	15.675	33.886
RG	175	-26.237	3,149.956	62.296	363.283
MBV	175	-1.307	59.414	3.457	8.975

VAIC = Value Added Intellectual Coefficient; ROE = Return on Equity; MBV = Market to Book Value; RG = Stock Return Growth; CEE - Capital Employed Efficiency; HCE - Human Capital Efficiency; SCE - Structural Capital Efficiency

For the multiple regression analyses, model 1 will be used to test hypothesis 1, model 2 will be used to test hypothesis 2 and model 3 will be used to test hypothesis 3, 4 and 5.

Table 2: Regression Model 1

Model	Coefficients	t-statistics	p-value	Co linearity Statistics	
				Tolerance	VIF
(Constant)	18.589	3.349	.001		
VAIC	.623	.794	.430	.994	1.006
ROE	.012	.110	.913	.986	1.014
RG	-.010	-.669	.506	.479	2.086
MBV	-.306	-.506	.615	.481	2.079
Adjusted R ²	0.14				

$$SR = \beta + \beta_1 \text{VAIC} + \beta_2 \text{ROE} + \beta_3 \text{RG} + \beta_4 \text{MBV} + \varepsilon$$

VAIC = Value Added Intellectual Coefficient; ROE = Return on Equity;

MBV = Market to Book Value; RG = Stock Return Growth

Table 2 exhibits that the significant value of VAIC is greater than 0.05 which means Ho is accepted. Intellectual capital does not affect stock return because this research is using a 95% confidence level to test the hypothesis. The other variables also failed to affect stock return. In addition, the model's R square value is only about 14%, which is quite a weak level to explain the change of the firm's financial performance.

Table 3: Regression Model 2

Model	Coefficients	t-statistics	p-value	Collinearity Statistics	
				Tolerance	VIF
(Constant)	102.748	.797	.428		

VAIC	.655	2.036*	.021	.994	1.006
ROE	1.416	.544	.588	.986	1.014
RG	.090	3.258**	.003	.479	2.086
MBV	-5.453	-.388	.700	.481	2.079
Adjusted R ²	0.21				

** indicates significance at 1% level.

* indicates significance at 5% level.

$SR_{t+1} = \beta + \beta_1 VAIC + \beta_2 ROE + \beta_3 RG + \beta_4 MBV + \varepsilon$

SR_{t+1} = Stock Return Growth; VAIC = Value Added Intellectual Coefficient; ROE = Return on Equity;

MBV = Market to Book Value; RG = Revenue Growth

Table 3 shows that the adjusted R-squared has significantly increased. Even though it is only about 21% which shows the model is quite weak in explaining the dependent variable. However, due to the high volatility of the stock exchange such a percentage is acceptable. The results show that intellectual capital (VAIC) significantly affects stock return growth (SR_{t+1}). The effect of intellectual capital investment starts to bear fruit in the following years. Mondal and Ghosh (2012) demonstrated that intellectual capital is an important determinant of banks' profitability and productivity in India. However a study on Pakistan banks by Sianipar (2012) revealed that IC has insignificant impact on financial performance through profitability which is measured by return on asset (ROA) and return on equity (ROE). Among the control variables, only RG significantly affects stock return in the future. The growth of revenue will catch an investor's eye and will favor positive changes in stock return in the future.

Table 4: Regression Model 3

Model	Coefficients	t-statistics	p-value	Collinearity Statistics	
				Tolerance	VIF
(Constant)	12.035	1.160	.250		
CEE	10.403	0.614	.540	.379	2.640
HCE	.435	3.615**	0.001	.721	1.388
SCE	10.526	.551	.583	.630	1.588
ROE	-.104	-.550	.584	.355	2.816
RG	-.010	-.690	.493	.477	2.097
MBV	-.320	-.522	.603	.480	2.085
Adjusted R ²	0.051				

** indicates significance at 1% level.

$SR = \beta + \beta_1 CEE + \beta_2 HCE + \beta_3 SCE + \beta_4 ROE + \beta_5 RG + \beta_6 MBV + \varepsilon$

VAIC - Value Added Intellectual Coefficient; CEE - Capital Employed Efficiency;

HCE - Human Capital Efficiency; SCE - Structural Capital Efficiency;

ROE - Return on Equity; MBV - Market to Book Value; RG - Revenue Growth

The table above shows that only HCE positively and significantly affects SR. In Australia, Joshi, Cahill & Sidhu (2010) found that only human capital has a significant impact on the efficiency of banks in value creation. Structural capital and capital employed efficiency have little or no impact on overall efficiency of the banks and its value creation process. The other elements of VAIC, namely SCE and CEE have no impact on the stock return. ROE, RG, and MBV have negative signs and have no significant effects on stock return.

Based on the statistical findings, the author concludes that intellectual capital affects stock return growth and one of its components - HCE - affects current stock return. This could happen because stock prices in Indonesia are more volatile and mostly being affected by external factors.

Usually it may take longer time for foreign investors to realize the implication of intellectual capital in the financial performance and in the country as a whole. Only HCE impacts the financial performance of firms in the banking sector. Since intellectual capital itself is an internal factor of the company, its effect on the stock price is very limited. External factors such as the economic and political conditions, government policy, exchange rate, and other macroeconomic elements account for most of the volatility of the stock market in Indonesia. According to Rudianto and Sutawidjaya (2012), the external factors have a positive influence on the share price.

The nature of the Indonesian stock market also influences the stock price. As opposed to other countries, in Indonesia most of the players are short term gain traders in the stock market. An annual report's role as a supporting source in investment decision-making has not been widely used optimally because investors tend to analyze the stock movements using technical analysis. Such programs are able to show that investors like to take

short term risks and speculate for profit (Adhikara, 2008). Another argument to support the low significance effect of intellectual capital on stock return might be the short time frame of the paper. According to Ulum, Ghazali & Chariri (2009), there is a possibility that intellectual capital's effect on company's performance will not be significant in the short term period of 1 year but over a longer period of time.

Intellectual capital does not affect the current stock return in banks, but will contribute to the growth of stock return concurrently with dominant external factors. Investors with high expectations about the prospects of stock return growth will incur lower stock return when the expectations are not met (Skinner and Sloan, 2002). Patelis (1997) argued that future stock return will be primarily affected by monetary policy shock and expected dividend growth.

Only one component of VAIC™ namely HCE affects stock return. A possible explanation of that is the investors' behavior in Indonesia who generally ponders on current profit earned by the company rather than long term benefit from how efficiently the companies generate their profit (Anisma, 2012). With the shift of investor focus only to current or short term profit earned by the firms, the importance of intellectual capital is undermined. Only one component of intellectual capital, HCE captures the consideration of investors in making investment decisions. Most Indonesian companies do not realize the importance of intellectual capital which could allow the creation of sustainable competitive advantage and profit in the future (Suhardjanto and Wardhani, 2010).

CONCLUSION

From previous papers, there have been different impacts of intellectual capital on firm's financial performance. In this research, intellectual capital (VAIC) only affects future financial performance because it may take some time before the effects materialize and are realized by investors. Among the components of intellectual capital, human capital efficiency (HCE) is the only factor that positively contributes to banking industry performance. That could be related to the service-focused line of business that banking is in.

Revenue growth (RG) from the three control variables is the only one to positively affect stock return. It could be explained by the accumulation of funds that will be then used to invest back in the business which in its turn will positively affect the stock return. This situation suggests that the Indonesian banking sector could maximize its financial performance by improving the other components of intellectual capital, namely capital employed and structural capital which are creating competitive advantage, essential for sustainability in the future. There are limitations that need to be considered for future research. This paper is only based on the banking sector, which could be enhanced by applying several sectors or industries of a given economy. The small scale time period could be widened for a better and stronger insight of the importance of intellectual capital.

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