

# Intellectual Capital and Firm Value: Evidence on Indonesia Banking Subsector

Sri Hasnawati<sup>1</sup>  
{[sri.hasna2015@gmail.com](mailto:sri.hasna2015@gmail.com)}<sup>1</sup>

Atika Putri Dianti<sup>2</sup>  
{[atikapd5@gmail.com](mailto:atikapd5@gmail.com)}<sup>2</sup>

Faculty of Economics and Business, Universitas Lampung, Lampung-Indonesia<sup>1</sup>

**Abstract.** This paper aims to examine the relationship between intellectual capital to firm value in the Indonesia banking subsector listed on the Indonesian Stock Exchange 2018-2020 related to resource-based theory and stakeholder theory. According to the resource-based theory, a company that has an extraordinary resource and is having a great empowering resource capability will achieve more competitive advantage than those that did not empower. In accordance to stakeholder theory, in which stakeholder is seen as a significant actor in developing a business, stakeholder theory is defined as a concept of strategic management where the goal is to help companies to strengthen their credibility to related external groups and develop a competitive advantage. However, the intellectual capital affect contribution that could be seen as intangible competitive advantage assets depends on the type of industry and in several pieces of research have a different result of significance on affecting firm value.

**Keywords:** Intellectual Capital, Profitability, Firm Value, Firm Size, Leverage

## 1 Introduction

In the current era, knowledge takes such an essential role in an organization since it plays a significant role in business development. Previous economic lenses that mainly focused on the empowerment of tangible assets had shifted to the use of economy with knowledge-based development. The knowledge-based economy could be defined as a source for innovation formation and ICT (Information, Communication, and Technologies) that affect the company's value [1]. Companies are in current have to face new challenges in maintaining their competitive aspect by always innovating and optimizing their potential assets, which focus on intellectual capital intangible assets. The value creation process that once relied on industry and was oriented towards increasing the number of production has shifted to the use of knowledge on producing products and services.

As the world turns to the era of globalization that is in unconscious recast the economics view on maintaining and developing a business, investors need not only financial disclosures but also non-financial disclosures to assist the decision-making process since intangible assets are no longer seen as valueless aspect in comparison to financial capital in providing truly sustainable income [2]. The reaction of the non-financial disclosure demand appears since it is seen to be able to provide firms development prospects [3] On developing the intellectual capital value, VAIC<sup>TM</sup> (Value Added Intelligence Coefficient) is used as a method since it could measure the performance of a company's intellectual capital [4]. VAIC<sup>TM</sup> has three components that are Value Added Capital Employed (VACA), Value Added Human Capital (VAHU), and Structural Capital Value Added (STVA).

The empowerment of intellectual capital is related to resource-based theory in which it is seen as the possible maximized strategic asset that is indicated to be able to maximize the firm value by, in correlation to stakeholder theory, maximizing the performance of all of the components that executed the business process. In correlation to the firm value, it is seen as the main indicator of valuing its performance [5] and also is become an important aspect for stakeholders to maximize. The companies' goal is mainly to reach the high firm value shown

by its continuous growth. This research will use price to book value (PBV) since firm value is generally captured on its PBV ([6]. A higher PBV tends to make the market more confident in the company's future prospects and is affecting the investors' consideration to trust their fund.

Profitability represented by return on equity (ROE) is used as moderating variable due to the indication of firm performance on moderating the effect relation between the intellectual capital and firm value. Profitability was also used in previous research of Sayyidah and Saifi in 2017 [7], and it showed moderation strengthens the effect of ROI on intellectual capital and firm value. In correlation to intellectual capital, the measurement of the three components of intellectual capital shows that intellectual capital has a significant impact on profitability. This research will use return on equity since it is seen as the bottom-line of accounting ratio of firm profitability. Its growth sustainability is counted as necessary since it influences the point of view of investors on perceiving the company [8]. This research will also use leverage and firm size as the control variable.

There are four intellectual capital (IC) intensive industry groups (banking, electrical, information technologies and services) [9]. This paper uses the banking subsector involved in High-IC Intensive Industry, the same character used in the previous research conducted by [7]. However, there is no absolute kind of effect relation between intellectual capital to firm value since the contribution of intellectual capital to firm value depends on the type of industry. Moreover, the positive and negative effects of intellectual capital on firm value are both likely to appear since there are lots of contradictive results related to the relation of these two variables.

## 2 Literature Review

Resource-based theory in the theory of strategic management cleared the idea that if a company has extraordinary resources, it will work in line with the reach of exceptional achievements. Under the resource-based theory, the organization will obtain such a competitive advantage reflected by its good financial performance by owning, controlling and empowering its strategic assets. The strategic assets that an organization could empower is divided into two, tangible and intangible. Tangible assets could be defined as any recorded resources on organizations' reports such as vehicles, machinery, building, et cetera. Meanwhile, intangible assets consist of any invisible strategic resources such as organizations' culture, employee knowledge and innovation, et cetera. It is needed to run and develop the combination between these two strategic assets for the purpose of supporting the organizations' value sustainability. In correlation to intellectual capital, companies will gain more competitive advantage by empowering its asset. One of the assets is the intellectual capital that counted as an intangible strategic asset. Empowering intellectual capital could be seen as an advantage since it indicates that a company has valuable knowledge.

Another theory used in this research is stakeholder theory. The theory ensures the relationship between stakeholders to companies' entire significant actor to have great relation by maintaining and fulfilling overall goals expectations. Stakeholder is seen as the significant actor with direct or indirect interests of companies' existence since companies' prosperity is depend on the stakeholder's support. A stakeholder could be defined as a tight-related party that has the power to effects and get affected by organizations' decisions. This theory also focuses on two aspects: it focuses on managing organizations' relationship to its overall stakeholder and carries the external probable contradictive organizations' interests actors. It is in correlation to the firm performance represented by profitability and firm value. In this theory, stakeholder management theory explained that stakeholder capability to affect companies' management is considered a function of stakeholder power to control its potential resources [10].

Intellectual capital could be defined as a form of valuable integrated knowledge and immaterial ownership that can be used to obtain new customers or investors that bring the firm to a higher bar of competitive advantage [11]. Intellectual capital on this paper is developed using VAIC<sup>TM</sup> method and is having three components named VACA or (physical capital), VAHU (human capital) and STVA (structured capital). VACA is the ratio between value-added (VA) and actual tangible capital (CE). The VAHU shows the ratio of the contribution of each rupiah invested in HC to the company's added value. Meanwhile, the STVA measures the amount of structural capital needed to generate 1 rupiah of added value (VA), where structural capital is gained from the difference between value-added and human capital.

Profitability could reflect the level of effectiveness in a company and is the reflection of companies' capability in generating profit. Several indicators could be used on measuring the value of firm performance reflects by profitability value. There are several indicators that can

be used, such as profit margin (PM), Operating Margin (OM), Basic Earning Power (BEP), Return on Total Assets (ROA), Return on Equity (ROE) [12]. Investors can use profitability as a point of investment consideration where profitability proxy that has been conducted in this paper is the return on equity (ROE) that reflects the companies' ability to generate profits from companies' shareholder investors expressed by return against equity percentage. Return on equity is being chosen as it reflects the effects of all of the other profitability ratios and counts as the single best accounting measure of firm performance on generating profit [12].

Firm value is counted as the primary aspect for a company to carry since it could evaluate companies' performance [5]. The value of a company could be seen by its stock price, which in this research is being measured by the use of price to book value (PBV) as the firm value proxy. Optimizing shareholder prosperity is a goal to achieve by making an effort to obtain a high stock price. It reflects the high return for investors [13]. There are several indicators that could be used to measure the firm value that are price-earnings ratio, Tobin's Q, and price to book value. When there is a previous research coming from Sayyidah and Saifi in 2017 [7] use Tobin's Q as the firm value proxy, this research will use price to book value; aside from that, it is also explained that firm value is in general captured in book value (PBV) [6].

This paper also uses firm size and leverage as the control variable. Firm size could be seen as a reflection of how big companies scale that could be seen as their amount of asset. This is important due to the consideration aspect that comes with the scale of a company since it is seen as correlated to a manifestation of the previous event that companies have experienced and counts as an advantage for a higher firm size value [14]. Meanwhile, leverage reflects the relation between liabilities to the empowerment of capital assets. It reflects the capability of a company to empower and gain funds to maximize its profit earnings process [14].

### 3 Methodology and Data Analysis

This paper is explanatory research since it is developed to measure the relationship between two variables. The technique used in developing the sample is purposive sampling. The population of this research is all banking subsector companies listed on the Indonesian Stock Exchange in the 2018-2020 periods. The total sample observations are 84 gained from 28 companies. Secondary data are acquired from [www.IDX.co.id](http://www.IDX.co.id) and yahoo! Finance. For the data analysis techniques, this paper will use classic assumption tests that are divided into normality test, multicollinearity test, autocorrelation test, and heteroscedasticity test. This paper will also use multiple regression analysis to develop the relation of three components of intellectual capital straight to the firm value and use moderating regression analysis to develop the effect relation between intellectual capital and firm value moderated by return on equity. The determination coefficient will also be used to measure the dependent variable's portion on reflecting the independent variable. For the hypothesis testing, this paper will use both f-test and t-test on developing the effect of intellectual capital on firm value both partially and simultaneously.

Models used in this research:

#### 1. Moderating regression analysis

$$Y = c + b_0 IC + b_1 M + b_3 ICROE + b_4 FS + b_5 LEV + e$$

Note:

Y	:Firm Value
c	:Constanta
$\beta_1$ - $\beta_5$	:Regression Coefficient
IC	:Intellectual capital
M	:Profitability
ICROE	:Interaction between Intellectual Capital and Profitability
FS	:Firm Size
LEV	:Leverage
e	:Error term, that is, the error estimation rate in this research.

## 4 Reserach Result and Discussion

### a. Statistic Descriptive

Table 1 Statistic Descriptive.

Predictor	N	Minimum	Maximum	Mean	Std. Deviation
IC	84	-39.8463	25.7855	4.050493	6.7709282
ROE	84	-.3855	.2595	.008174	.1259953
ICROE	84	-2.0270	1.2499	.221450	.3907906
FS	84	27.2226	34.8960	30.757344	1.6873241
LEV	84	.1586	.9321	.788432	.1506237
PBV	84	-1.3891	2.6842	.386421	.8692829
VACA	84	-.3396	.5812	.130889	.1445322
VAHU	84	-3.0937	3.2282	1.293668	1.1295199
STVA	84	-40.8851	24.5782	2.625946	6.5573378
Valid N (listwise)	84				

Intellectual capital has a high correlation to competitive advantage where it is seen as, in the resource-based theory, taken from a strategic management perspective, is categorized as a strategic intangible asset. There are five categories on interpreting the value of intellectual capital [15]. The mean value for intellectual capital is 4.050493, reflecting that companies observed in this study are generally run in a good performance since the value is above 3.5 but is not yet in the category of successfully performed since its value is below 5. It means that the observed companies are already likely to empower their human and facilities related under the intellectual value point of view and generate it as knowledge of innovation for its competitive advantage. The standard deviation for intellectual capital is 6.7709282 with a 4.050493 mean value. Since the standard deviation has a more excellent value to its mean value, it can be a sum that the data of intellectual capital used in this study is having an extreme gap and is not varies well.

Return on equity (ROE) is the ratio of the company's net income to capital (core capital) [16]. This ratio shows that the percentage level that ROE can generate is scored as essential to shareholders and potential investors because a high increase in ROE will cause stocks to rise. The descriptive statistics for a total of 84 observations show an average value of 0.008174 or 0.8174%, which means that the return on the equity value of the average company data listed in this study is having a rate of return 0.8174% on each equity empowered to profitability purpose. The ratio value that shows a positive number indicates that the company can generate income for each empowered equity. In contrast, the ratio value with a negative number indicates that the company cannot generate income from each empowered equity which can be interpreted as experiencing a loss in equity. That idea means that the greater the return on equity percentage ratio, the better the rate of return for each empowered equity. Comparing return on equity ratio among the observed industry, the low value of return on equity ratio is likely to appear since there is an extreme gap among the data. Comparing the data observed and the mean value, 59 of 84, 70.2380%, the value of the return on equity ratio is above the return on equity ratio average value. It means that there are 59 data values of the return on equity ratio that is seen as considerable on the assumption that the value of the ratio, having a greater value than the average value of the overall observed data and is considered a good rate of return. Other than that, the standard deviation for return on equity is 0.1259953 with a 0.008174 mean value. Since the standard deviation has a more excellent value to its mean value, it can be a sum that the data of return on equity used in this study is having an extreme gap and is not varies well. The low mean is also indicated to appear since the rest of the 25 companies have less value than the average and show negative value.

The results of descriptive statistics for the dependent variable, firm value proxied by price to book value, show that in a total of 84 observations, the price to book value variable shows the average value of a positive 0.386421, which means that ordinary companies listed in this study have 0.386421 market share price in every 1 actual share price or in other word, undervalued. In simple terms, a firm value that shows a number below one is seen as a good value because it means that the stock is selling for less than the original value of the stock. With this traditional assumption, the mean value of the industry in the studies can be interpreted as showing a good value. Taking another frame of reference, investors consider that price to book value with a value below 3 is still acceptable where in addition, it should be noted that there

is no specific value that can be used as a criterion for a good price to book value. It means a low price-to-book value (below 1) cannot fully mean that a company has good corporate value and vice versa. It is because the ratio analysis of price to book value varies greatly from one industry to another.

For the VAIC™ components (VACA, VAHU, and STVA), the standard deviation for VACA is 0.1445322 with a 0.130889 mean value. The standard deviation for VAHU is 1.1295199 with a 1.293668 mean value. The standard deviation for STVA is 6.5573378 with a 2.625946 mean value. Since the standard deviation for each component has a more excellent value to its mean value, it can be a sum that the data of intellectual capital components used in this study is having an extreme gap and is not varies well. It is known that the component that contributes the most to the value of intellectual capital is STVA, followed by VAHU, and the component that contributes the least is VACA. It means that the companies observed in this study rely more on structural capital in empowering their overall intellectual capital.

The standard deviation for firm size is 1.6873241 with a 30.757344 mean value. Firm size can affect the policy tendency of risk management where companies with larger sizes will often use hedging [17]. In correlation to its mean and low firm size gap among the data indicates that the average data used in the study is having a similar behavior in terms of corporate firm value hedge. The other control variable, the standard deviation for leverage is 0.1506237 with a 0.788432 mean value. Leverage is described to see how the company's assets are financed by debt compared to its capital. In correlation to leverage mean value, the average value of 0.788432 on leverage can be interpreted that 78.8432% of the company's banking industry assets in this research are obtained by debt funding. Since the standard deviation for firm size and leverage has less value than its mean value, it can be a sum that the data of all control variables used in this study is varied well.

## b. Normality Test

According to kolmogorov-smirnov test results, it is found that the Asymp. Sig values obtained by the first model and the second model in this research are both has value above alpha = 0.05. The model has an Asymp value. Sig 0.200 > 0.05 and Kolmogorov-Smirnov 0.063. It can be concluded that the residuals are normally distributed since it is fulfilling the Kolmogorov-Smirnov normality test assumption. Gained from multicollinierity test result, it is shows that there is no multicollinearity appears since all predictors show a VIF value of less than 10 (based on the multicollinearity normality test assumption). The results of the multicollinearity test at the model shows the VAIC VIF value of 1.156, ROE of 1.924, IC\*ROE of 1.690, FS of 1.485, and LEV of 1.352 and there is no heteroscedasticity occurs since the scatterplot chart shows spread dots both above and below the number of 0 and shows no specific pattern. The results of the Autocorrelation Assumption Test for the model is 1.7732 < 1.800 < 2.2268. Based on that result, it is found that the Durbin Watson value in both the first and second models is in the range of  $dU < d < -dU$ . So it can be concluded that there is no autocorrelation occurs. Aside from that, the value of adjusted R<sup>2</sup> shows the value of 0.273, which shows the portion of the proportion effect of VAIC, ROE, IC\*ROE, leverage, and firm size on PBV of 27.3%, where the other 72.7% is influenced by other indicators.

## c. F-test

Table 2 F-Test.

F-test	Sig.
Model 1	0.000

The F-test shows the significant relation between intellectual capitals to firm value moderated by return on equity. This model shows a significant simultaneous relation to firm value, involved VAIC, ROE, IC\*ROE, Firm Size, and Leverage as predictors. It is shown that the significance valuefor model is 0.000, where it is value < 0.05 ( $\alpha$ ); assumption of simultaneous relation is fulfilled.

#### d. T-test

Table 3 T-test.

T-test	Predictor	Sig.
Model 1	IC	0.370
	ROE	0.000
	IC*ROE	0.010
	Firm Size (FS)	0.796
	Leverage (LEV)	0.012

Table t-test above shows that there is a significant partial effect between intellectual capital to the firm value after being moderated by return on equity. The positive moderation effect shows from the once insignificant sig. Value of VAIC to PBV of 0.370 to a significant 0.010 IC\*ROE sig. value. Firm size as one of the two control variables shown insignificant relation since it has sig. value is 0.796. It means that there are other variables other than firm size that could affect firm value. Leverage has shown a significant effect to firm value of  $0.012 < 0.05$ . It means that leverage is one of the other variables that could affect firm value.

The results of the statistical test that once supports a positive effect on firm value is not supported by this study's results. The study supports the results of [18], [19], and [20] stated that intellectual capital does not affect firm value and is having contradictive results to [7] and [5]. Since the contribution of the intellectual capital is likely to depend on the industry and supports both negative and positive results in between two variables, both kind of relation is likely to appear. The insignificant relation is in line with the indication of incapability of stakeholders on valuing the intellectual capital as in [19] research. It stated that intellectual capital resource investment is risky since it comes along with the low degree of certainty of its outcome. The idea of justification is supported by the research of [20], claiming that investment in the form of intellectual capital resource is considered to have negative value due to its result unpredictability. This is likely to appear in correlation to the stakeholder and resource-based theory since intellectual capital is less prioritized to be seen as investment considerations and stakeholder strategic assets point of view.

In contradictive, the interaction test results show that return on equity can moderate the relationship of intellectual capital to firm value in the banking subsector. It means the companies are able to optimize its return on equity to innovate and determinate the company's routine processes and infrastructure that supports the banking industry's employees in improving the performance of their intellectual capital. Aside from that, in correlation to the theories and the research result, it shows an idea indication that the availability of return on equity is more prioritized to use as investment considerations rather than an independent intellectual capital. Under the resource-based theory, an independent intellectual capital is not a valuable intangible strategic asset but is a valuable strategic asset when it is seen with the moderation effect of return on equity. Moreover, under the stakeholder theory, a stakeholder is more likely to put more prioritize to return on equity rather than intellectual capital as a delineation on how to give value to an organization.

## 5 Implication and Suggestion for Future Research

Based on the t-test result, Intellectual capital does not have a significant relation to firm value. The insignificant value indicated that stakeholder does not see intellectual capital as a prioritized consideration of strategic assets on valuing a firm. The moderation result shows that return on equity could moderate stakeholders' point of view on valuing the intellectual capital on the influence to firm value. Firm size, taking a role as a control variable, shows an insignificant relation to firm value. The insignificant relation is likely to appear due to the very tight gap in the studied industry. The tight gap could be interpreted as the value does not show a significant differentiation value representing an advantage. Leverage, shows a significant value that could be interpreted that the empowerment of debt on funding the assets in the banking industry is seen as essential for investment consideration. In the hope for further research, researchers can conduct research by using other moderating variables, haven't been used, unlike return on equity and return on investment, which are also thought to be able to moderate. In addition, researchers can also use other sectors due to a statement that the contribution of the relationship between intellectual capital and firm value depends on the sector that being studied.

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