The Impact of Intellectual Capital on Financial Performance

Novie Susanti Suseno, Tinneke Hermina, Abdullah Ramdhani, Lia Utari

Abstract: This research is carried out to examine the impact of intellectual capital by using a measurement of Value Added Intellectual Coefficient (VAIC) comprising of Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE), and Capital Employed Efficiency (CEE) on financial performance measured by Return On Asset (ROA). This research applied causalitas method. The data of this study were quarterly financial reports consisting of statement of financial position (balance sheet) and statement of profit and loss from 2013 to 2015 of Bank of Perkreditan Rakyat Syariah PNM Mentari Garut (BPRS PNM Mentari). The data were analyzed by using double linear regression. The result of data analysis revealed that Human Capital Efficiency has no influence on ROA. It also revealed that Structural Capital Efficiency exerts no influence on ROA. Furthermore, the analysis indicated that Capital Employed Efficiency significantly influenced ROA. Based on such findings, this research proposed a generic model that can be adopted by similar organizations in improving financial performance.

Index Terms: *Keywords: Intellectual Capital, Human Capital Efficiency, Structural Capital Efficiency, Capital Employed Efficiency, Return on Asset (ROA).*

I. INTRODUCTION

The development of banks under sharia principles in Indonesia has shown considerable progress. It indicates that Islamic economy has developed in Indonesia[1]. With the average growth of assets reaching more than 65% a year in the past five years, it is expected that the role of sharia banking industries in supporting national economy will be more significant[2]. Sharia banking sector is a business sector that is intellectually insentive in nature and it is also included in service sector in which customer service heavily relies on the intellect of human capital. This is what causes intense competition in the world of banking to change business from labour based business to knowledge based business[3]. One of the approaches used in the assessment and measurement of knowledge based business/knowledge asset is Intellectual Capital [4].

Related to intellectual capital in sharia banking, in Indonesia even globally, there are very few banks that possess Sharia banks' operational skills [5]. It is line with an article in Kompas.com[6] stating "one the problems in sharia banking is human resources in which banks find it extremely challenging to find competent human resources of sharia

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banking". Furthermore, the secretary general of the Indonesian Sharia Banks Association (Asbisindo) Acmad K Permana explained that sharia banking still hire human resources from conventional banking and very few human resources taken or graduated from sharia university.

In addition, in relation to structural capital, 2013 Sharia Banking Development Outlook claimed, "the process of adjusting information technology infrastructure takes place in relatively limited fashion in terms of both products and the number of networks utilized." It confirms that structural capital in sharia banks is still limited since they still cannot compete with other conventional banks. For example, the products provided by sharia banks to their customers are still limited different from other conventional banks in which they offer additional products such as facilitating payment for electricity bills.

To measure Intellectual Capital, proposed indirect measurement toward intellectual capital with a measure to assess the eficiency of additional value as a result of the the firm's intellectual ability (Value Added Intellectual Coefficient – VAIC) [7]. Value Added Intellectual Coefficient (VAIC) method is designed to present the information of value creation efiiciency from tangible assets and intangible assests owned by the firm. Considering the importance of intellectual capital in word economy today, a lot of researchers believe that intellectual capital play a vital role in leveraging the value of firms and financial performance bu using Human Capital Efficiency, Structural Capital Efficiency, Capital Employed Efficiency which make up VAIC (Value Added Intellectual Coefficient) model as a measurement model[8]

One of financial measurements to measure firm performance is by using Return On Asset (ROA). ROA ratio offers a better measure on the firm's profitability since it shows manajement effectiveness in the use of assets and capital to earn revenue. The higher the ROA, the better it is since the level of revenue is higher[9].

Empirical studies on IC have shown varying results. Researches conducted by Mavridis[10], Tan et al [11], Saengcahan [12], Ulum et al [13], Jati [14] and Kamila [15] revealed that intellectual capital significantly influenced firm's financial performance. Different from them, a study carried out by Firer dan Williams[16] claimed that physical capital is the most significant factor that influences a firm's performance in South Africa. In line with Firer and William, Kuryanto's [17] stated that intellectual capital did not exert any influence toward a firm's financial performance.

The lack of consistency in empirical evidence causes the need to further examine research models that were used in the previous studies in different place, time and condition. This research focuses on banking sector since it refers to a research conducted by Kamila [18] who stated banking industry is one of the sectors that has the highest insentives on intellectual capital. In addition, based on intellectual aspect, the employees in banking sector are generally more homogenous compared to other economic sectors.

Based on the review of the aforementioned phenomenon, this research is intended to measure the influence of intellectual capital by employing methods of Human Capital Efficiency, Structural Capital Efficiency, and Capital Employed Efficiency as part of VAIC[TM] method toward the firm's financial performance based on Return on Asset.

II. LITERATURE REVIEW

A. Intellectual Capital

Hong [19] defines Intellectual Capital as knowledge-based assets in firms that serve as the core competence basis that affect their sustainability and competitive advantage. Another definition was proposed Joia [20] in which intellectual capital is defined by members of the intellectual capital community. It is often divided into various components, which refer to the skill and competents reffering to relationship with costumer or other stakeholders (relationship capital), and components reffering to oeganizational culture rotines and practices, or intellectual property (organizational or structural capital). Even though these component are often defined or bundled slightly differently, it shows how broad the scope of the concept of intellectual capital really is. While Bontis *et al.*[21] stated that Intellectual Capital is made up of three main constructs namely human capital (HC), structural capital (SC), and customer capital (CC). human capital (HC) represents individual knowledge stock of an organization represented by its employees. HC is a combination of genetic inheritance; education; experience, and attitude on life and business. Furthermore, Bontis *et al.* claimed SC covers all non-human storehouses of knowledge in an organization. SC includes database, organisational charts, process manuals, strategies, routines and everything that enhances the value of a firm than ts material value. Meanwhile CC is knowledge that is embedded in marketing channels and customer relationship that is developed by an organization though its business operation.

B. Value Added Intellectual Coefffient (VAIC)

Method of Value Added Intellectual Coefficient (VAIC) also known as Value Creation Efficiency Analysis was developed by Austrian Intellectual Capital Research Centre (AICRS) led by Pulic [22]. This method is designed to present information on value creation efficiency from tangible asset and intangible assets. In calculating VAIC, Value Added (VA) is the difference between income (OUT) and input (IN). The formula to calculate VA is as follows:

$$VA = OUT - IN$$
- OUT = Total income
- IN = Total cost except employee salary and benefits

Value Added Intellectual Coefficient / VAIC[TM]
The formula to calculate VAIC is as follows:

$$VAIC = HCE + SCE + CEE$$

The advantage of VAIC method is the data required is easily accessible from numerous sources and types of companies. Such data required to calculate the different ratios are financial figures that are generally available from a firm's financial report. This approach is relatively feasible and highly possible to be reconstructed from financial statement posts which are balance sheet and profit and loss statement [23].

Up to this point, there has not been any standards on performance scores of Intellectual Capital. However, a research conducted by Ulum [24] proposed a category and calculation interpretation of VAIC:

1. Top performers – VAIC score higher than 3,00
2. Good Performers – VAIC score from 2,00 to 2,99
3. Common Performers – VAIC score from 1,5 to 1,99
4. Bad Performers – VAIC score less than 1,5

C. Financial Perfomance

Financial performance is an important aspect which influences the long term stability, profitability and liquidity of the organization. Financial statements are an input for financial analysis to examine the firm's performance [25]. One of profitability ratios that is most frequently used is Return On Asset (ROA) ratio, also known as profit ratio to the whole assets [26]. Return on Asset (ROA) is a measure of a firm's ability to utilize its assets to generate profits by comparing income with the assets that generate the profits [27].

D. Research Framework And Hypothesis

The conceptual framework is developed based on extensive literature review of studies about *Intellectual Capital and* Financial performance.

In a study carried out by Firer dan Williams [28], intellectual capital was represented by VAIC and the study tested the influence of IC toward firm perfromance that included profitability (ROA), productivity (ATO), and market to book value (M/B). The result of the study shows that intellectual capital only exertd influence on market to book value and productivity, but not on profitability.

Mavridis [29] conducted a research to banking companies in Japan. The findings revealed that intellectual capital influences financial performance. It means that the best performance is resulted by banks that better manage their intellectual capital and less use their physical capital.

Najibullah [30] undertook a research on the influences of VAIC (Human Capital Efficiency, Structural Capital Efficiency, Capital Employed

Efficiency) toward financial performance (ROA). The result indicated that HCE, SCE, and CEE did not assert any influence on Return on Asset.

Tan *et al* [31] investigated companies in financial sectors including banking, insurance, and brokerage firms. The study srcutinized the relationship between intellectual capital and financial performance. The findings revealed that there ia a relationship between intellectual capital efficiency and firm performance. There is a positive and significant relationship between intellectual capital and ROA and profitability.

Ulum *et.al* [32] carried out a research to measure the influence of intellectual capital on firm performance of 130 banks that operated in Indonesia from 2004 to 2006 and regularly reported their financial statements to Bank Indonesia (BI). The findings of this study showed there was a significant influence of intellectual capital mesured by VAIC on firm performance in the period of three years.

Kuryanto [33] investigated the influence of intellectual capital on financial performance of 73 companies registered in Indonesia Stock Exchange (IDX). The findings revealed that there was no positive influence between firm intellectual capital on its performance. Even though the value of intellectual capital is higher, it does not increase the future firm performance. This study used Pulic model. In this study, the Value Added Intellectual Coefficient (VAIC™) was employed to measure firm's intellectual capital.

Talita [34] conducted a research on the relationship between components of intellectual capital, including Human Capital Efficiency, Structural Capital Efficiency, and Capital Employed Efficiency, and Return on Asset. The study revealed that the component with the highest positive correlation is Capital Employed Efficiency.

Saengchan [35] also investigated the relationship between components of intellectual capital, including Human Capital Efficiency, Structural Capital Efficiency, and Capital Employed Efficiency, and Return on Asset. The result showed that Structural Capital Efficiency, Capital Employed Efficiency have positive influence on ROA, but Human Capital Efficiency negatively influences ROA.

Jati [36] conducted a study intended to analyze the influence of Intellectual Capital on profitability, productivity, and firm value. Intellectual Capital was measured by using Value Added Intellectual Coefficient (VAIC). The findings depicted that Intellectual capital positively and significantly influences profitability, productivity, and firm value simultaneously. Human Capital Efficiency positively, yet not significantly influences profitability. Structural Capital Efficiency positively, yet not significantly influences profitability. Capital Employed Efficiency positively and significantly influences profitability

Based on theretical grounds and previous studies, this research formulates the following hypotheses:

H1 : Human Capital Efficiency (HCE) influences Return on Asset (ROA).

H2 : Structural Capital Efficiency (SCE) influences Return on Asset (ROA).

H3 : Capital Employe Efficiency (CEE) influences Return on Asset (ROA).

III. METHODOLOGY/MATERIALS

This section presents research methodology adopted in this study. It explains selection criteria of the sample, variables of the study and research model, and hypotheses. This research applied causalitas method. The data were analyzed by using double linear regression.

A. Sample

The source of data in this study was derived from sinancial statements of a sharia bank PT Bank Perkreditan Rakyat Syariah PNM Mentari Garut (BPRS PNM Mentari) in Indonesia. The study examines quarterly published financial reports consisting of Balance Sheet and Income Statement from 2013 to 2015.

B. Variables of the Study

1) Dependent Variable: Return on Assets (ROA)

Return on Asset (ROA): Return on asset is a measure of afirm's ability to utilize its assets to generate profits by comparing income with the assets that generate the profits [37].

It can be calculated as follow: $\dfrac{\text{Net Income}}{\text{Average Total Assets}}$

2) Independent Variable : Intellectual Capital

a) Human Capital Efficiency (HCE)

refers to collective value of firm's intellectual capital comprising of competence, knowledge and skill measured by Human Capital Effeciency (HCE) which is an indicator of valued added of human capital efficiency [38].

The formula to calculate HCE is as follows:

> HCE = VA: HC
> - HC = Human Capital

b) Structural Capital Efficiency (SCE)

is competitive intelligence including formula, information system, patents, process policy, etc. It is a result of a firm's product or system that has been produced over tima. It is measured by Structural Capital Effeciency (SCE) which constitutes an indicator of value added in structural capital efficiency [39].

The formula to calculate SCE is as follows:

> SCE = SC: VA
> - SC = VA-HC

c) Capital Employe Efficiency (CEE)

is defined as the total capital utilized in a firm's fixed and current assets. It is measured by Capital Employed Effeciency (CEE), which is an indicator of value added of the efficiency of the capital employed [40].

The formula to calculate

CCE is as follows:

$$CEE = VA: CE$$
- CE : available fund (equity and gross profit)

Based on theoretical grounds, previous studies, and research framework, this research employs the following research model as shown in fig.1.
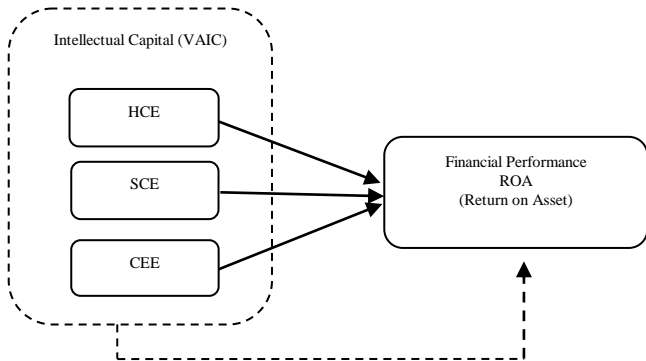

Fig. 1. Research Model

IV. RESULT AND FINDING

A. Analysis Results of Double Linear Regressions

The result of analysis of double linear regressions using SPSS 20.0 for windows is presented in the following table.

Table I. Analysis Results of Double Linear Regressions
Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-,767	,420		-1,823	,106
1 HCE	-,029	,013	-1,938	-2,145	,064
SCE	,103	,052	1,721	1,977	,083
CEE	,156	,034	1,060	4,534	,002

a. Dependent Variable: ROA

Based on the table, it can be estimated that the regression model is as follows:

ROA = -0,767- 0,029 HCE +0,103 SCE+ 0,156 CEE

Based on the equation of double linear regressions, it can be seen that the value of constant is -0,767. It means that if the coefficient of human capital efficiency, structural capital efficiency, and capital employed efficiency are zero, then the ROA of Financial Performance is -0,767.

Regression coefficient of human capital efficiency is -1,938. It means that if the coefficient of other independent variables is fixed and HCE increases as much as 1%, then financial performance (ROA) will decrease. Different from Structural Capital Efficiency (SCE) with a high coefficient

1,721, it shows that there is a positive relationship between SCE and financial performance (ROA). If SCE rises, then financial performance (ROA) will also rise and vice versa. As Fajarini [41] mentioned, "Structural Capital Efficiency is positive because Structural Capital needed by employees in a firm is able to meet the demands of the firm's routines in producing optimum performance."

Regression coefficient of Capital Employed Efficiency is 1,060. It means if the coefficient of other independent variables is fixed and CEE increases as much as 1%, financial performance (ROA) will increase. The positive relationship is supported by Soetedjo [42] who claimed, "If capital employed by a firm is relatively high in amount, it will cause the total asset of the firm relatively expand, so the revenue of the firm will increase. This can raise profit on a number of assets owned by the firm as measured by Return on Asset (ROA).

1) Testing Coefficien of Determination

The result of analysis coefficient of determination is presented in the following table:

Table II. Analysis Results of coefficient of determination
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,912[a]	,832	,769	,16513

a. Predictors: (Constant), CEE, SCE, HCE

Based on equation of coefficient of determination, it can be seen that the value coefficient determination (R^2) is 0,769. It means that *Human Capital Efficiency, Sructual Capital Efficiency,* dan *Capital Employed Efficiency* have influence to financial performance as much as 76,9%.

B. Hypotheses Testing

1) The influence of Intellectual Capital on Return on Asset (ROA)

Table III. Analysis Result F- Test

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1,079	3	,360	13,193	,002[b]
1 Residual	,218	8	,027		
Total	1,297	11			

a. Dependent Variable: ROA

b. Predictors: (Constant), CEE, SCE, HCE

Based on The result of statistical testing is F_{count} 13,193 > F_{table} 4,066. It has the level of significance of 0,002, lower than 0,05. In other words, H_0 is rejected and H_a is accepted. It means that Intellectual Capital significantly influences ROA as much as 76,9%.

2) The Influence of Human Capital Efficiency (HCE) on Return on Asset (ROA).

Based on table I, it can be seen that the relationship between HCE and ROA is

negative. Further hypothesis testing shows that HCE has no influence on ROA.

With the significance level of 5% = 0,05 and with df = n – k – 1 or 12 – 3 – 1 = 8 (n is the number of sample and k is the number of independent variables), then the coefficient of t_{tabel} is 2,306. The result for the first independent variable HCE is that since the significance level 0,064 is higher than 0,05, it means that H_0 is accepted and H_a is rejected. It substantiates that Human Capital Efficiency does not influence Return on Asset (ROA). Human Capital Efficiency apparently has not supported the improvement of the firm's financial performance. There are a number of factors that causes the inability of HCE to increase profit in PT BPRS PNM Mentari. There is an indication that the salary and benefits provided by the company has not been able to motivate the employees in leveraging revenue and the firm's profit. To make matters worse, there has been a lack of measures to develop human resources such as training and employee career development.

Such a result is in line with the findings of a study conducted by Maheran *et al* [43], which revealed that sales volume and manajemen in minimizing costs are more prioritized to increase firm's profit than mananging non-financial aspects such as human capital to achieve financial performance. Maheran *et al* [44] affirmed, "Human Capital indicated by Total Expenditure on Employee is a cost component that exerts no influence on either revenue or sales". Such a component ia a fixed cost in which the direct contribution on revenue or sales is difficult to determine.

3) The Influence of Structural Capital Efficiency (SCE) on Return on Asset (ROA).

Based on table I, the coefficient of t_{count} is 1,977, lower than t_{table} with 2,306 (t_{count} 1,977 < t_{table} 2,306). It has significance level of 0,083, higher than 0,05. It means that H_0 is accepted and H_a is rejected. It means that structural capital efficiency does not influence return on asset.

Based on the hypothesis testing, the results revealed that structural capital efficiency exerts no influence on return on asset. Structural Capital Efficiency seems unable to increase profitability. This finding supports the findings in studies conducted by Talita [45] and Chen *et.al* [46] which instantiated that Structural Capital Efficiency has no influence on firm's financial performance, and it can concluded that Structural Capital Efficiency is not a good indicator in explaining a firm's Structural capital. Structural Capital is only measured by subtracting Value Added from Human capital. It is indicated that this measurement is unable to capture the overall Structural Capital.

There are several factors contributing to the inability of Structural Capital Efficiency to increase profit. Among others is the high expenses for employees. There is an indication that the amount of Structural Capital required by PT BPRS PNM Mentari is not able to meet the demands of the firm's regular processes in generating optimum performance. Without good management of Structural Capital including in management of system, procedures, and database, employees creativity in generating Value Added will be hampered.

Such a result is parralel to that of a study carried out by Bontis *et.al* [47], which state that firms are unable to create culture to motivate employees in ding their work and to improve performance. Organizations with stong structure will posses culture that is supportive and allows their employees to try new things.

4) Capital Employe Efficiency (CEE) influences Return on Asset (ROA).

The result of statistical testing is t_{count} 4,534 > t_{table} 2,306. It has the level of significance of 0,002, lower than 0,05. In other words, H_0 is rejected and H_a is accepted. It means that Capital employed efficiency significantly influences ROA. As a result, in this research capital employed efficiency is more dominant in exerting influence on financial performance as measured by return on asset (ROA).

Based on the hypothesis testing, this research suntantiates that Capital Employed Efficiency positively and significantly influences Return On Asset. It explains that the implementation of capital efficiency can increase ROA. This element is the most dominant component of Intellectual Capital that influences Return on Asset. Therefore, if capital employed by PT BPRS PNM Mentari is in relatively huge amount, then it will cause the total assets in relatively large amount. Therefore, PT BPRS PNM Mentari will gain increasing provit as measured by Return on Asset.

This result is in line with Maheran *et.al* [48], Chen *et.al* [49], and Tan *et.al* [50]. Based on a study conducted by Jati [51], CEE exerts significant influence on financial performance. This result explains that the capital employed is the value of assets that contributes to the profitability of the firm. Tan *et.al* [52] explained, "when capital employed in a firm is in a relatively large amount, the revenue of the firm will increase". It means that PT BPRS PNM mentari has better performance.

V. CONCLUSION

A. Conclusion

Based on the overall empirical analysis, it substantiates that there is a relationship between Intellectual Capital—Human Capital Efficiency, Structural Capital Efficiency dan Capital Employed Efficiency—and financial performance of PT BPRS PNM Mentari. However, when the influence is tested, it shows that Human Capital Efficiency has no influence on financial performance of PT BPRS PNM Mentari, Structural Capital Efficiency exerts no influence on financial performance of PT BPRS PNM Mentari, has presented evidence to support the notion that develeloping intellectual capital can increase profit and competitive advantage. As a result, it clearly indicates that mechanisms of intellectual capital such as human capital and capital employed can generate appropriate impact to increase bank performance. Therefore, intellectual capital will gain more acceptance as a crucial factor to leverage sustainable firm performance. Such a result highlights the importance of intellectual capital especially capital employed and human capital toward banking performance, so intellectual capital can be recognized as one of important indicators that exerts significat effect on bank performance.

B. Implication for Future Research

This study shows that intellectual capital is related to a firm's financial performance, despite the fact that it also reveals negative relationship. This study uses Value Added Intellectual Coefficient (VAIC) model to evaluate a firm's financial performance. Future research can implement different methods to measure firm performance namely market to book value ratio (MB), Earning Per Share (EPS) and Net Profit Margin (NPM) in order to obtain a better insight on a firm's ability in creating firm values.

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