INTELLECTUAL CAPITAL AND FINANCIAL PERFORMANCE ON BANKING FIRMS IN INDONESIA

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ABSTRACT

With the rapid advancement of global economic progress, lot of innovation has been made and attract researchers to investigate Intellectual Capital (IC). The purpose of this paper is to find any relationship Intellectual Capital toward Financial Performance. Using Value Added Intellectual Coefficient (VAIC) Model and the modified version as the research model. This study takes secondary data from companies that published its annual financial statement in Indonesia Stock Exchange during 2017 until 2022. The gathered data then analysed by using regression panel method. This research shows that Human capital doesn't significantly affect ROA and ROE but does significantly affect ATO in both VAIC model and Modified VAIC model. Structural capital also insignificantly affects ROE and ROE but significantly affect ATO when tested using VAIC model. Capital employed and innovation capital is proven to a positive significant effect to all dependent variables.

Keywords : Intellectual Capital; VAIC Model; Modified VAIC Model; Firm Performance

ABSTRAK

Dengan pesatnya kemajuan ekonomi global, banyak inovasi yang dilakukan dan menarik para peneliti untuk menyelidiki Intellectual Capital (IC). Tujuan dari penulisan ini adalah untuk mengetahui hubungan Intellectual Capital terhadap Kinerja Keuangan. Menggunakan Model Value Added Intellectual Coefisien (VAIC) dan versi modifikasi sebagai model penelitian. Penelitian ini mengambil data sekunder dari perusahaan-perusahaan yang menerbitkan laporan keuangan tahunannya di Bursa Efek Indonesia selama tahun 2017 hingga tahun 2022. Data yang terkumpul kemudian dianalisis dengan menggunakan metode panel regresi. Penelitian ini menunjukkan bahwa Human Capital tidak berpengaruh signifikan terhadap ROA dan ROE, namun berpengaruh signifikan terhadap ATO baik pada model VAIC maupun model Modified VAIC. Modal struktural juga tidak berpengaruh signifikan terhadap ROE dan ROE namun berpengaruh signifikan terhadap ATO jika diuji menggunakan model VAIC. Modal yang digunakan dan modal inovasi terbukti berpengaruh positif signifikan terhadap seluruh variabel dependen.

Kata Kunci : Intellectual Capital; VAIC Model; Modified VAIC Model; Firm Performance

INTRODUCTION

Global economic progress has been advanced rapidly along with information, technology, and science. With the thrive of knowledge-based economy, lot of innovation and changes has been made to adapt the condition. Determinant of

productivity does not depend on tangible inputs (capital, plant, and machinery) anymore but it started to switch to professional workers who are qualified and technically proficient. (Vishnu & Gupta, 2014).

Many scholars are drawn by the change to a knowledge-based economy to study and examine intangible assets like intellectual capital (IC). Intellectual capital, unlike physical capital that can be measure or find out the exact value is still a mystery and can be explored deeper until it can be clearly defined. Razafindrambinina & Anggreni, (2011) stated one of the unique characteristics from IC is that it is hard to imitate by competitor that makes it a powerful source for the entity.

The purpose from creating a company other than non-profit organization, is to create maximum profit with lowest cost possible (Juliani & Tanwijaya, 2022). Entity needs to create a value and establish it as competitive advantage. Effective management toward IC acknowledged as one of the most important source of value creation in this modern era (Nawaz & Haniffa, 2017). IC refers to the intangible assets and the wealth of knowledge which can be used to create new value by transforming into new product, processes, service and methods. Therefore, IC is a critical point and play an important role toward firm sustainability. It is also necessary to determine IC owned by company then utilize it effectively to gain competitive advantage and maintain entity's financial performance.

Nadeem et al., (2019) on their research shows that IC are typically difficult to identify in a corporation's balance sheet but are crucial to the process of creating wealth for the firm, in contrast to physical assets, which have a private segment on the balance sheet report. Ozkan et al., (2017) also agree that balance sheet do not attempt to provide enterprise actual value but only prepared for reporting purposes. Data obtained from financial report alone failed to show accurately regarding company value and didn't reflect how IC may practically creating competitive advantage value for a company.

While IC is being supported theoretically as an importance asset, most of previous study show inconsistent result Soewarno & Tjahjadi (2020). Difference may occur due to there is no fix measurement to identify IC value of a company. The Value Added Intellectual Coefficient (VAIC) technique evaluates the value of IC in a business. This methodology calculates IC by analyzing data on employed capital, structural

capital, and human capital. Researchers frequently utilize the VAIC model to assess IC effectiveness at the corporate level (Nadeem et al., 2019).

Most previous researchers use conventional VAIC to define the value of intellectual capital (Dzenopoljac et al., 2017; Maji & Goswami, 2017; Soewarno & Tjahjadi, 2020; Nawaz T & Haniffa R, 2017). There are also researchers who use the modified model of VAIC which include innovation as one of the factors (Maji & Goswami, 2017; Nadeem et al., 2018; Nimtrakoon, 2015; Soewarno & Tjahjadi, 2020). In order to determine the association between VAIC & company performance, this research will use both the VAIC and modified-VAIC models. Based on previous research, the significance of this study is to provide the information regarding the influence of IC in companies, particularly in banking industry which has more intangible assets in the balance sheet than other industries in Indonesia. As a results, this study provides academic insights about IC of banking industries in Indonesia.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

VAIC and its Modified Version

Resource Based View Theory describe that an entity could achieve competitive advantage and direct company with sustainability by utilize internal resource owned. Internal resource meant could be either tangible or intangible. Intellectual Capital itself is categorized as intangible asset and describe as a body of knowledge, data, and intellectual property that can identify opportunities and counteract dangers in the course of a business. (Iwan & Affandi, 2016). These internal resources also create a sustainable competitive advantage to the entity due to it can't be easily duplicated by their competitors.

The majority of academics take into account utilized capital, structural capital, and human capital when measuring intellectual capital (Dzenopoljac et al., 2017; Maji & Goswami, 2017; Mohammad et al., 2018; Nadeem et al., 2019; Ousama & Fatima, 2015; Ozkan et al., 2017; Soewarno & Tjahjadi, 2020; Vishnu & Gupta, 2014). There are also not less researchers that modified and adjusting the VAIC model to by applying or removing some factors (Iwan & Affandi, 2016; Maji & Goswami, 2017; Nimtrakoon, 2015; Soewarno & Tjahjadi, 2020; Wang et al., 2021).

The company employees serve as a representation of human capital. The individual knowledge owned by every individual is the source for innovation and

creativity. Structural capital refers to the infrastructure that supports employee efforts to achieve overall business performance. Capital employed refer to relation maintained with internal and also external. In this study, the modified VAIC model, which defines research and development investment as adding value to intellectual capital, replaces structural capital with innovation capital.

Intellectual Capital and Firm Performance

This study looks for any connections between intellectual capital and business performance. Several methods can be used to identify and measure firm performance, most of the researchers use Return on Asset (ROA) to analyze financial performance (Chouaibi & Kouaib, 2015; Maji & Goswami, 2017; Nadeem et al., 2019; Nimtrakoon, 2015; Soewarno & Tjahjadi, 2020). There are also researchers (Juliani & Tanwijaya, 2022) who use Return on Average Asset (ROAA) to determine company profitability. It is thought that a reasonable way to assess a company is financial capacity is to compare how much it can generate to the resources or assets it can consume. This study also adds others component such as Return on Equity (ROE) and Asset Turnover (ATO) as indicator for financial performance. ROE can show firm's efficiency from handling investment from their shareholder. Higher ROE mean firm has good capability on generating income from equity while higher ATO define company efficiency earning sales revenue from assets owned.

Human capital resource owned by company consist of general or specific skill possesses by employees. Even though these skills trusted to be able to improve firm's financial performance, some of previous studies cannot find any significance relationship between HC and ROA (Ousama & Fatima, 2015; Soewarno & Tjahjadi, 2020). These findings contradict with Dženopoljac et al., (2016), Maji & Goswami (2017), T & R (2017) which all of their result show that HC give an significant positive relationship on company ROA.

Soewarno & Tjahjadi (2020) expand their research by including ROE & ATO to find the relationship with HC. Their finding is HC have negative insignificant relationship toward ROE and surprisingly HC has an significant relation toward ATO, this finding differ with Dženopoljac et al., (2016) that discover the higher HC owned by company will increase company ROE & ATO. There are also other researchers that

can't prove HC can significantly effect company ATO (Dzenopoljac et al., 2017; Razafindrambinina & Anggreni, 2011).

Dženopoljac et al., (2016) find that SC has significantly influence financial performance for Serbian Information Communication Technology (ICT) sector. The results demonstrate a significant positive correlation for ROA and ROE but a significant negative correlation with ATO that is in line with research by Razafindrambinina & Anggreni, (2011) that state SC has positive and greater influences on ATO but the influences will be better in lagged one-year. A further study that demonstrates the importance of the association between SC and the financial performance proxies of ROA and ROE done by Ousama & Fatima (2015) using Malaysia Islamic banks as an example. Dzenopoljac et al., (2017) study Intellectual Capital by using data from Arab Region. The study including 100 publicly traded firm and selected by Middle East Forbes, research findings SC & CE significantly influence earnings but don't have significance result to firms' efficiency which measured by ATO.

Chowdhury et al., (2019) study that looked into IC in the pharmaceutical industry in Bangladesh found that CE had a significant impact on organizational performance as measured by ROA, ROE, and ATO. Other researchers (Dženopoljac et al., 2016; Maji & Goswami, 2017; Ousama & Fatima, 2015; Soewarno & Tjahjadi, 2020) find a substantial correlation between CE and financial indicators and this strongly favors the financial performance of the company. The only insignificance result showed by Razafindrambinina & Anggreni (2011) using the 2003–2006 annual report of the Consumer Products Corporation, which was listed on the Jakarta Stock Exchange. Study by Soewarno & Tjahjadi (2020) that adds innovation capital, which includes R&D costs, to the traditional VAIC model demonstrated a significant positive relationship with ROA but an insignificant relationship with ROE and ATO.

VAIC Model

H_1 Financial performance is highly impacted by human capital efficiency, structural capital efficiency, and capital employed efficiency (Return on Asset)

H_2 Financial performance is highly impacted by human capital efficiency, structural capital efficiency, and capital employed efficiency (Return on Equity)

H_3 Financial performance is highly impacted by human capital efficiency, structural capital efficiency, and capital employed efficiency (Asset Turnover)

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A-VAIC Model

H_4 Human capital efficiency, innovation capital efficiency, capital employed efficiency significantly affect financial performance (Return on Asset)

H_5 Human capital efficiency, innovation capital efficiency, capital employed efficiency significantly affect financial performance (Return on Equity)

H_6 Human capital efficiency, innovation capital efficiency, capital employed efficiency significantly affect financial performance (Asset Turnover)

RESEARCH METHOD

Types of Research

A quantitative research approach will be used in this study. Subjects in quantitative research often employ one or more data types in order to enrich the synthesis that has previously been explored. The goal of this quantitative technique is to evaluate the theory's validity, demonstrate the relationship between each variable, construct a factual truth, present an overview in the form of statistical descriptions, and predict test outcomes.

Data Types and Sources

This study utilized quantitative data in the form of numbers (metric). Secondary data, such as financial statements, annual reports, and sustainability reports, were processed and obtained from the Indonesia Stock Exchange (IDX) website and the websites of firms.

Population and Sample

Purposive sampling was employed to sort the research objects according to the researcher's criteria. The population was composed of banking firms that were listed on IDX. The samples are from annual reports that the banking companies published between 2017 and 2022.

Research Variable

Dependent Variable

The dependent variables in this study are three profitability measures. The first is ROA. ROA (return on assets) is an accounting performance indicator that can be determined by calculating the net profit attributable to shareholders divided by total assets (Hidayat et al., 2022). ROA indicates how effective management is at generating profits from its assets (Ousama & Fatima, 2015). The second measurement is ROE

which is net income divided total shareholder equity. ROE measures how efficiently a company generates profits (Dženopoljac *et al*., 2016). The third is ATO, which is the ratio of total revenues to total assets' book value. ATO represents a company's level of productivity. It evaluates a company's ability to produce revenue from its assets (Nawaz & Haniffa, 2017).

Independent Variable

The VAIC and A-VAIC models employed by are applied to calculate intellectual capital as the independent variable as used by Soewarno and Tjahjadi (2020), Vishnu and Gupta (2014), Nimtrakoon (2015) and Maji and Goswami (2017).

The VAIC Model

The HCE, SCE, and CEE together make up the three components of the VAIC model, which is used to measure intellectual capital. The VAIC can be figured as follows:

VAIC = HCE + SCE + CEE

VA = P + C + S + D + A

HCE = VA / HC

SCE = SC / VA

CEE = VA / CE

SC = VA – HC

where VA represents the whole of its revenue (P), expenses (C), salaries (S), and depreciation (D) and amortization (A); Human capital (HC) is determined by total personnel costs, structural capital (SC) is calculated using VA-HC, and capital employed (CE) is determined by net asset book value.

The A-VAIC Model

HCE, innovation capital efficiency (INVCE), and SCE make up the IC component in this approach. The A-VAIC can be figured as follows:

A-VAIC = HCE + INVCE + CEE

HCE = VA / HC

INVCE = VA / INVC

CEE = VA / CE

VA = I + L + I + T + DA + RD

INVC = VA / (RD + CR)

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where VA is the total of the company's income (I), labor costs (L), interest (I), taxes (T), depreciation and amortization (DA), and research and development (RD); INVC is determined by RD and copyrights (CR).

RESULT AND DISCUSSION

Descriptive Statistics

Table 1 contains information on descriptive statistics, including the minimum, maximum, mean and standard deviation for each variable. These statistics provide a comprehensive overview of the data used as sample for this research, helping us to understand more about the characteristics of each variable. Researcher initiate the analysis using descriptive statistic as solid fundamental foundation to gain a deeper understanding for every variable.

According to table 1, average ROA for banking company during 2017 – 2022 showing only 0,25%. There are total of 39 data showing negative result among 240 samples collected. BBHI (Allo Bank Indonesia Tbk PT) during 2021 generate 4,14% ROA as the highest ROA holder, while the lowest ROA came from AGRO (Bank Raya Indonesia Tbk PT) during the same year. ROA values reveal the profitability and asset utilization of companies in the dataset. The higher the ROA showing that company is able to manage its asset more profitably. (Aziz et al., 2023)

ROE data generate insight from the shareholder's view. As one of the indicator to measure financial performance (Faruq et al., 2023), it drives us to understand more about how much and how capable of a company to payback to their shareholder. Average values for ROE showing 0,40% that is quite a low return for investment that shareholder should consider when making decision to invest in banking company. Data shown the highest risk for the shareholder is to lost for 353% from the investment while the most prosper investment only payback for around 21%.

ATO indicator help us to understand more about the ability of a company to convert assets owned into revenue. Data shown by table 1 giving us insight that in average, every Rp 1 asset owned by a banking company may generate Rp 0,07 every year. The most efficient company in utilizing its asset are shown by BTPN (PT Bank Tabungan Pensiunan Nasional Tbk) in 2017 after taking a big step in innovation and transform into a customer centric service and enhancing digital banking experience by launching a platform called Jenius.

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The average HCE value is 3.389301, indicating that the average banking firm can generate more value for more than three times the cost of human capital. BJBR (PT. Bank Pembangunan Daerah Jawa Barat dan Banten Tbk) in 2018 is the most efficient company in term of Human Capital Efficiency (HCE) after the statistics show the maximum value of 19,93. BJBR able to optimize their workforce almost 20 times of their Human Capital (HC).

SCE indicates mean value for 0.547039 which represents the structural capital allocation of the Indonesian banking sector on average. In average, SC and HC proportion in VA of every banking company almost evenly the same.

The average value created over each year is less than 5% of the company's asset worth, as indicated by the CEE mean figure of 4.09%. This value may be because the majority of the banking sector must make significant investments in its assets in order to offer top-notch customer service. This outcome is giving us insight that every investment of net asset in banking company provide at 4,09% added value every year. Stakeholder may take into account the average CEE when allocating fund for future asset investment.

INVCE, which serves as the independent variable for the modified VAIC model, yields a mean value of 150,19 demonstrating that the average amount of money each firm spends on innovation, such as R&D, represents a relatively tiny portion of their added value. Reflecting on descriptive statistics, it means every innovation cost may produce VA that is 150 times higher than the cost.

Regression Analysis

Table II presents the findings and outcomes of the regression analysis. The analysis shows the impact of HCE, SCE, CEE, and INVCE on the financial performance of the Indonesian banking firm as measured by ROA, ROE, and ATO. When all independent variables exhibit significant results in both the VAIC model and the modified VAIC model, the influence on ATO is the greatest. Regression shown by table 2 may help us to gain a better understanding toward the complexity relationship between IC and Firm performance.

First VAIC model tested HCE, SCE, and CEE with ROA as dependent variables. Resulting both HCE and SCE have significant impact toward ROA, while no significant effect shown by CEE. This result is supported by previous study (Dženopoljac et al.,

2016; Maji & Goswami, 2017) that found both significant result from HCE and SCE and there are also study that only found 1 significant result among HCE and SCE (Chowdhury et al., 2019; Nawaz & Haniffa, 2017; Razafindrambinina & Anggreni, 2011; Soewarno & Tjahjadi, 2020). How company handle their human resources to increased productivity will affect their financial performance. It can be interpreted that when a skilled and motivated employees are optimized properly through effective training and development programs, company has a potential in increasing their added value. SCE has an significant negative relationship to ROA, Chowdhury et al., (2019) and Nawaz & Haniffa (2017) also found out negative relationship between SCE and ROA but insignificant. Company that invests more on their structural capital tend to lower their ROA, non-human capital in banking company didn't directly increase their ROA. It often involves longer time before showing positive result.

Second VAIC model tested HCE, SCE, and CEE with ROE as dependent variables. Surprisingly, no any indicator that show significant result toward ROE. This result differs from previous study (Chowdhury et al., 2019; Dženopoljac et al., 2016; Ousama & Fatima, 2015; Soewarno & Tjahjadi, 2020) that found at least 2 significant result from these 3 IC indicators. Banking company capital structure consist mostly by debt and smaller amount from their shareholder's equity because bank rely heavily on financial resources. In such scenario, IC has lower association with ROE.

Third VAIC model tested HCE, SCE, and CEE with ATO as dependent variables. This model shows significant result from HCE and CEE. HCE has a significant negative result, align with previous researcher (Chowdhury et al., 2019; Razafindrambinina & Anggreni, 2011; Soewarno & Tjahjadi, 2020) that also explain the more cost company spend on human capital may lower their asset turnover ratio, it may due to the spending on human capital is not capitalized as asset while it is paid by the company asset. SCE shows a negative relationship, this result does not support prior studies by Razafindrambinina & Anggreni, (2011) that show contradictory result but consistent with research by Dženopoljac et al., (2016). The higher company spend on the structural capital will result in lower asset turnover. CEE show a positive significant result align with research by Dzenopoljac et al., (2017); Razafindrambinina & Anggreni, (2011); Soewarno & Tjahjadi, (2020). As company able to maximize their capital employed efficiency will bring higher asset turnover for the company as return.

Efficient management on company's working capital used in their daily operations will enhance their utilization that means generating more income from every capital.

The main difference between VAIC model and Modified VAIC model is on the existence of INVCE. Modified VAIC model remove SCE as independent variable and modify it by adding innovation as another way to measure intellectual capital. Modified VAIC model shows significance relationship when tested against financial performance by ROE and ATO which when tested on VAIC model unable to provide significance impact. INVCE show negative relationship toward all of the financial performance indicator. Differ from findings by Soewarno & Tjahjadi (2020) that show positive relationship toward ROA and ATO. This study failed to identify significance relationship between INVCE and ROA, defining to management that the higher cost spend on training, research, and development area don't guarantee to lower company ROA by spending too much fund on development. But this study indicates the more efficient a company managed it innovation capital will surely lower their ROE and ATO.

CONCLUSION

This research excavates any effect from Intellectual Capital against Banking Industry profitability in Indonesia from 2017 – 2022. Findings in this research show that Human capital doesn't significantly affect ROA and ROE but does significantly affect ATO in both VAIC model and Modified VAIC model. Structural capital also insignificantly affects ROE and ROE but significantly affect ATO when tested using VAIC model. Capital employed and innovation capital is proven to a positive significant effect to all dependent variables.

Conclusion of this research is to identify any significance factor that company may missed out due to its "intangible" characteristics. Company can pay more attention toward its intellectual capital as one of their precious assets that have potential to improve financial performance. There are few ideas that might be useful for future research such as (1) Explore other modified VAIC model, (2) Develop the model further by adding control variables, (3) Widen the research by observing company from other sector.

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TABLES

Table 1. Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	SD
Dependent Variables					
ROA	240	-0.180577	0.041398	0.002577	0.024504
ROE	240	-3.533425	0.209358	0.004032	0.268993
ATO	240	0.024108	0.148840	0.072583	0.017916
Independent Variables					
HCE	240	-3.300935	19.928241	3.389301	2.456596
SCE	240	-19.461986	2.818525	0.547039	1.360754
CEE	240	-0.067572	0.086487	0.040956	0.018805
INVCE	240	-187.819067	1300.432015	150.192390	172.930050

Table 2. Regression Analysis

	ROA		ROE		ATO	
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
VAIC Model						
HCE	0.002189	0.0191	0.012549	0.1845	-0.001399	0.0014
SCE	-0.002087	0.0463	-0.003912	0.7582	-0.000241	0.6184
CEE	0.150626	0.1434	-0.344246	0.7694	0.802706	0.0000
Modified VAIC Model						
HCE	0.002182	0.0217	0.030899	0.0107	-0.001365	0.0005
INVCE	-0.000019	0.4010	-0.000361	0.0192	-0.000052	0.0000
CEE	0.152713	0.1418	-1.914985	0.1472	0.797573	0.0000