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The Influence of Intellectual Capital Elements on Company Performance

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Abstract

Intellectual capital is becoming a crucial factor for a firm's long-term profit and performance in the knowledge-based economy as more firms identify their core competence as invisible assets rather than visible assets (Itami, 1987). The company was encouraged to measure financial and non-financial factors, including the customer perspective groups, the internal business process, learning and growth perspective, then to link all these measurements in a coherent system. This paper seeks to investigate the influence of intellectual capital elements on company performance, as well as the relationship among intellectual capital elements from a cause-effect perspective. Resource-Based View (RBV) considers intellectual capital as resource and capability to sustain competitive advantage on company performance. The partial least squares approach is used to examine listed banks in Indonesia Stock Exchange for year 2017-2019. Results show that human capital directly has positive influences on innovation capital, customer capital, and process capital. Innovation capital has positive, but less significant influence on process capital, which in turn influences customer capital. Human capital and process capital also influence customer capital. Finally, customer capital contributes to performance. This study helps management to identify relevant intellectual capital elements as competitive advantage and their indicators to enhance business performance.

Keywords: Intellectual Capital, Resource Based View, Competitive Advantage

JEL Classification Code: M41, O32, O34, G21

1. Introduction

Intellectual capital is becoming a crucial factor for a firm's long-term profit and performance in the knowledge-based economy as more firms identify their core competence as invisible assets rather than visible assets (Itami, 1987). This trend stresses the importance of organizational learning capability and how to create, manage, and evaluate intellectual capital. Kaplan and Norton (1996) suggested that managers need a multi-dimensional measurement system to perform measurement, called balance scorecard approach. The company was encouraged to measure financial and non-financial factors, including the customer perspective groups, the internal business process, learning and growth perspective, then to link all these measurements in a coherent

system. The idea of balance scorecard and intellectual capital measurement can achieve the same goal by different means (Chen & Zhu, 2004; Solikhah, Wahyudin, & Rahmayanti, 2020; Murdayanti et al., 2020).

The ASEAN Economic Community (AEC) is envisioned to foster robust productivity growth through enhancement intellectual capital, such as innovation, technology and human resource development that is designed for commercial application to increase ASEAN's competitive edge. ASEAN Member States need to take a concerted effort to improve their innovation and technological capability. The challenge toward a more innovative ASEAN is investment in research and development (R&D) and human capital development, and for quality assurance, technology diffusion and innovation. Efforts to address the following strategic measures could contribute to enhance support system and enabling environment to nurture a highly mobile, intelligent and creative human resource that thrives on knowledge creation and application (Xuan, 2020).

According to the Human Capital Report 2015, released by the World Economic Forum (2015), Indonesia ranked 69th out of 124 countries in terms of human capital development. Alarmingly, other ASEAN countries are above Indonesia, for example Singapore (24th), the Philippines (46th), Malaysia (52nd), Thailand (57th) and Vietnam (59th).

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World Economic Forum (2015) confirms that Figure 1 elucidates a fairly high correlation ($R = 0.60$) between a nation's human capital optimization and its GDP per capita. This correlation proves that builds and leverages its human capital is one important determinant for GDP growth. The purpose of this index is to convince the public and policy-makers that they can and should evaluate country development not only by economic growth but also improvements in human capital.

Resource-Based View (RBV) perspective resources that are valuable, rare, imperfectly inimitable, and non-substitutable can be transformed into competitive advantages. For intellectual capital understood as resources and strategic capacities, led to us to raise its assessment in order can gain and sustain competitive advantage. Castro, Verde, Saez, and Lopez (2010) indicated that, when facing an economic environment of high competition, enterprises must have the ability in innovation, quality, and velocity to generate competition capability. Among the elements of intellectual capital, human capital is the most fundamental element (Bontis, Chong, & Richardson, 2000; Wang & Chang, 2005). Kooistra and Zijlstra (2001) point out that human knowledge and experience are the main elements, which are the base of other elements and which will impact a company's value through affecting other elements. Prior research has suggested that human capital may play an important role in the generation of innovative activity within an industry if it is characterized by high-quality knowledge exchange among the main players within that industry (Kaplan & Norton, 2004; Wang & Chang, 2005).

Wang and Chang (2005) observed that innovative ideas may be turned into products and services through the transformation of the internal process. The enhancement of innovation capabilities helps to increase the quality of the

internal process. Kaplan and Norton (2004) explain that a human capital objective is to identify best practices wherever they occur in the organization and to disseminate the best practices rapidly to every organization process. According to the cause-effect relationship stating that human capital possibly affects process capital, could be obtained (Kaplan & Norton, 1996; Wang & Chang, 2005). Anderson and Sullivan (1993) argue that customer repurchase product will depends on customer satisfaction. The companies that are quickly handling the complaints of customer lead to loyalty and reduce the negative impression by the customer. According to Pan and Zinkhan (2006), the innovation used for strategic orientation toward customer satisfaction, loyalty, and to gain market potential, increases the market share of the company. Fornell (2016) found that the satisfaction of customers could maintain the business relationship and improve company's prestige (Masum, Latiff, & Osman, 2020).

Most research is using Value Added Intellectual Capital (VAIC) as the single indicator of Intellectual Capital (Muhammad & Ismail, 2009). VAIC parameters may not represent intellectual capital of a company (Stähle, Stähle, & Aho, 2011). Stähle et al. (2011) explain that VAIC merely indicates the efficiency of the company's labor and capital investments. Most of the research focuses on the impact of individual intellectual capital's positive influence on company performance without looking into an integrated framework that describes the relationship among individual intellectual capital elements. Many factors, such as corporate strategy and industrial characteristics, may affect a firm's value drivers. Thus, it would be appropriate to put emphasis on the interrelationship between intellectual capital elements from macroscopic perspective (Wang & Chang, 2005; Sanyal, Hisam, & Baawain, 2020).

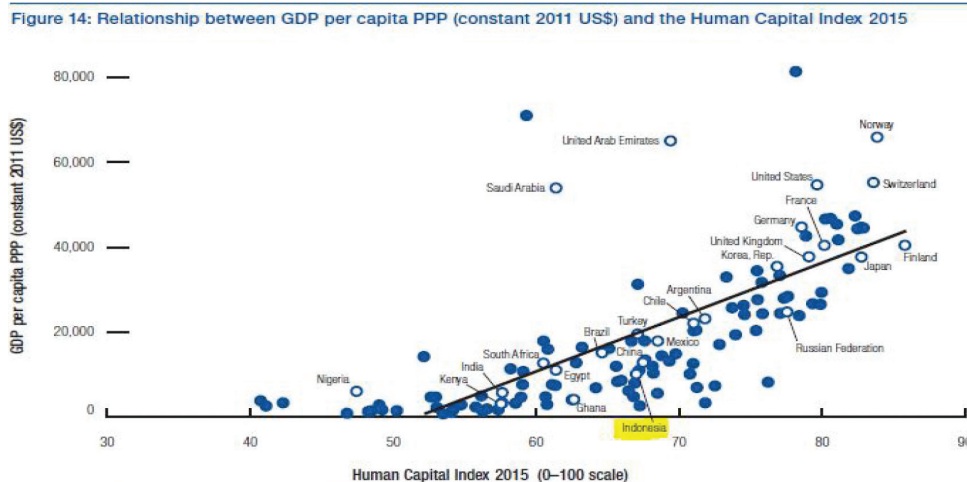


Figure 1: Relationship between GDP and Human Capital Index 2015

Source: World Economic Forum (2015)

This research seeks to investigate the cause-and-effect relationship among intellectual capital elements and its influence on banking performance of companies listed in Indonesia Stock Exchange 2019. The intellectual capital elements in this model are human capital, innovation capital, process capital, and customer capital (Bontis et al., 2000; Edvinsson & Malone, 1997; Wang & Chang, 2005). This research is applied to banking industry listed on Indonesia Stock Exchange for the years 2017 to 2019. Companies in banking are a knowledge-intensive, skills-based and relationship-rich industry. Firer and Mitchell Williams (2003) stated that banking is an industry that has the most intensive intellectual capital since banking industry is an industry that is based on high intellectual and information technology. Currently, the majority of the bankers estimated that up to 25% of the customer transactions are processed through the Internet and mobile banking (Coopers, 2015). The majority of the bankers indicated that the investment in the Internet and mobile banking is their top priority in 2015. Many customers expect that the transactions they can do at the branch can also be similarly done on their digital channel. Researcher attempts to replicate an integrated framework of intellectual capital from Wang and Chang (2005). It is encouraged by the reasons that the improvement of company performance can be established through the appropriate management of intellectual capital elements. For interested outside parties such as investors and creditors, understanding the relation among intellectual capital elements and bringing the related information into consideration is helpful for evaluating and enhancing the company's value.

Furthermore, this research framework also adds the hypothesis whether human capital influences the customer capital. In banks, employees directly connect to customers. Employees who have high skills to interact with customers through providing knowledge from or to customers will maintain current customers and attract new ones (Chen & Zhu, 2004; Stewart, 1997). Resource-based view has stressed that a firm that adheres to market orientation examines the customer needs and then seeks to develop its resources such as employees' skills and competences to serve the customers (Castro, Verde, Saez, & Lopez, 2010).

Previous research was conducted in Taiwan's IT industry, which has a different business environment than Indonesia. Taiwan is an important hub for regional and global trade and investment, especially in high-tech industries (Coopers, 2015). While in Indonesia, the past year 2014 had been a challenging year for the Indonesian economy. For companies in banking in 2014, the average net interest margin (NIM) for Indonesian banks in 2014 was down to 4.2% from 5.1% in 2013 (Coopers, 2015). Bankers view that margin pressure is the biggest challenge today; banks face more regulation, expectations and public scrutiny than ever before. Considering

the different business environment in Indonesia and Taiwan, the results of this research replication are expected can be applicable in Indonesia and help related party to make proper decision in manage their intellectual capital.

2. Literature Review

This research relied on intellectual capital and resource-based view theory as guidance to solve the research problems. Skandia's Taxonomy is the grand theory that elucidates the elements of intellectual capital and the relation among the elements. Resource-based view theory is the supporting theory that elucidates managing intellectual capital is strategic resources and capabilities for gaining competitive advantage (Barney, 1997).

2.1. Skandia's Taxonomy of Intellectual Capital

Itami (1987) stated that the company's economic value is not merely the sum of the values of its tangible assets. Company's economic value must include the value of intangible assets: the number of innovative products, the knowledge and high-quality production processes, employee talent, and morals, customer loyalty and product awareness, reliable suppliers, and efficient distribution networks (Johnson & Kaplan, 1987). Reported earnings cannot show the company's decline in value when it depletes its stock of intangible resources. Recent overemphasis on achieving superior long-term earnings performance is occurring just at the time when intangible performance has become a valid indicator of changes in the company's long-term competitive position (Johnson & Kaplan, 1987).

Skandia's value scheme contains both financial capital and intellectual capital blocks that combine to estimate the company's market value. Stewart (1997) defines intellectual capital as packaged useful knowledge. Sullivan (2000) defines it as 'knowledge that can be converted into profit. Roos and Roos (1997) posit that intellectual capital is the 'sum of knowledge' of its members and practical translation of this knowledge into brands, trademarks and processes. Edvinsson and Malone (1997) define it as the possession of knowledge, applied experience, organizational technology, customer relations and professional skills that provide a company with a competitive edge in the market that can be converted into profit. Intellectual capital to be the sum of all knowledge firms utilize for competitive advantage. Intellectual capital is the sum of the hidden assets of the company not fully captured on the financial report, and thus includes both what is in the heads of organizational members, and what is left in the company when they leave.

Structural capital is divided into two subsections, namely, customer and organizational capital. Organizational capital has two subsections: innovation and process capital

(Edvinsson and Malone, 1997). From a shareholder's point of view, structural capital can be owned and traded, however human capital cannot be owned, it can only be rented (Edvinsson & Malone, 1997). Therefore, human capital is much more volatile and structural capital can be used as leverage for financing corporate growth.

2.2. Resource-Based View of Competitive Advantage

Resource-based value (RBV) theory is sustained by two fundamental axioms. The first axiom argues that resource endowments are heterogeneously distributed among firms, and this explains differences in firm performance. The second axiom affirms that the owning or control over superior resources and capabilities allows the firm to sustain the competitive advantage (Castro, Verde, Saez, & Lopez, 2010). This last axiom prevents competitors in eroding a successful resource-based strategy. This situation appears when the firm controls resources and capabilities which characteristics make them hardly susceptible to imitation. Nevertheless, we must take into account that not all the assets that a company owns or controls have the same strategic value.

2.3. The Influence of Human Capital on Innovation Capital

Human capital is the foundation of intellectual capital, a primary element to perform intellectual capital's functions (Bontis et al., 2000; Chen & Zhu, 2004; Edvinsson & Malone, 1997; Karl-Erik Sveiby, 2001; Kooistra & Zijlstra, 2001; Wang & Chang, 2005). Edvinsson and Malone (1997) described innovation capital as renewal capabilities of a company in the form of intellectual properties and other intangible assets used to create and introduce new products and services to the market.

Prior research has suggested that human capital may play an important role in the generation of innovative activity within an industry if it is characterized by high-quality knowledge exchange among the main players within that industry (Hargadon & Sutton, 1997; Wang & Chang, 2005). In this respect, the accumulation of human capital among knowledge workers is necessary for pooling individual cognitive ideas and perspectives to solve problems associated with the new product development activities (Chen & Zhu, 2004). Building on this premise, human capital is crucial for creative solutions, new commercial opportunities, better products, and satisfactory new product development outcomes.

H₁: Human capital has a positive influence on innovation capital

2.4. The Influence of Human Capital on Customer Capital

In banks, employees directly connect to customers. Employees' competence, skill and commitment support customer capital through acquiring and sharing customer knowledge. Human capital can be described as the employees' competence, inter-relationship ability and values (Roos, Roos, & Edvinsson, 1997). Customer capital refers to the capability to build relationship between customer to gain customer satisfaction, customer retention rate, and customer loyalty (Mcelroy, 2002). Employees who have high skills to interact with customers through providing knowledge from or to customers will maintain current customers and attract new ones (Chen & Zhu, 2004; Hsu & Fang, 2009). Bontis et al. (2000) mentioned that the positive relationship between human capital and customer capital is significant regardless of industry type (service or non-service). Similarly, Shih, Chang, and Lin (2010) reported that human capital has a positive and direct influence on customer capital.

H₂: Human capital has a positive influence on customer capital

2.5. The Influence of Human Capital on Process Capital

Human capital represents the individual knowledge stock of an organization as represented by its employees (Bontis et al., 2000). The quality of employees determines the internal process quality and service quality. The implementation of process capital relies on employees, which belong to human capital element (Wang & Chang, 2005). Process capital, in practice, embraces the practical knowledge of operations, techniques, and employee programs in the effort to extend and enhance the efficiency of manufacturing or the delivery of products and services for achieving competitive advantage (Edvinsson & Malone, 1997). Employees must be relied on to carry out the internal processes of a company, while employees also perform all customer services. Since employees provide the quality of service while implementing internal processes, the capability of employees would affect process efficiency, quality, and customer satisfaction (Kaplan & Norton, 2004).

H₃: Human capital has a positive influence on process capital

2.6. The Influence of Innovation Capital on Process Capital

Wang and Chang (2005) observed that innovative ideas may be turned into products and services through the

transformation of the internal process. The enhancement of innovation capabilities helps to increase the quality of the internal process. In the resource-based view of a firm, innovation capital, treated as the ability of a company to create and commercialize innovations, can be regarded as a bundle resource. An asset or resource is strategic if it fulfills the requirements of being valuable, seldom, immobile and not substitutable (Barney, 1997).

The complexity of many modern innovations, however, necessitates a pooling and integration of multiple strands of this knowledge. Ven (1986) observed that the invention or conception of innovative ideas may be an individual activity, innovation (inventing and implementing new ideas) is a collective achievement. Thus, organizations accumulate, codify, and store individual knowledge in manuals, databases, and patents for collective current and future use and establish robust structures, systems, and processes (such as new product development teams and formal product-planning processes) to streamline individual inputs into steady streams of innovative outcomes (Cooper, 2001).

H₄: Innovation capital has a positive influence on process capital

2.7. The Influence of Innovation Capital on Customer Capital

The innovative idea that convert into a product or service must have the quality to satisfy some specific needs of the customers and can be implement at an economic cost (Nemati et al., 2010). Customer capital refers to the relationship between a certain organization and the people it deals with, such as customer satisfaction, customer retention rate, and customer loyalty (Mcelroy, 2002). In the era of intense competition every business tries to achieve customer satisfaction in competitive environment which is considered key elements for all businesses (Anderson & Sullivan, 1993). Innovation leads to the customer satisfaction in every sector because company brings innovative changes in its products to make customer satisfied and meet their needs. Sometimes customers are very conscious about the behavior of company related their complaints either companies take their complaints seriously or not. If the companies work on customer complaints then customer think company care them that enhance the customer satisfaction (Bolton, 1998).

H₅: Innovation capital has a positive influence on customer capital

2.8. The Influence of Process Capital on Customer Capital

To achieve improved customer relationships, a business may need to shorten the cycle time of its operating processes

and develop high-quality internal processes. For example, Seggie, Kim, and Cavusgil (2006) show that the positive effect of partner dependence on the focal firm is a causal factor of firm performance, and thus an excellent supply chain can improve customer relationships. According to balanced score card perspective, a company that displays efficient operating processes with reduced cycle time and improved quality, creates customer loyalty (Kaplan & Norton, 2004). Kaplan and Norton (2004), in balanced scorecard framework, explain that process capital create and deliver the value proposition for customers. The performance of process capital is a leading indicator of subsequent improvements in customer outcomes. The higher efficiency and effectiveness of company process, the higher profitability of the business. Moreover, better services result in higher chance of customers returned and advertisement by customers (Wang & Chang, 2005).

H₆: Process capital has a positive influence on customer capital

2.9. The Influence of Customer Capital on Company Performance

Customer satisfaction is a key factor in future tendency to make a purchase. In addition, satisfied customer probably talks about their positive purchase experience with others. This is more evident in East culture with stronger social contacts (Jamal & Naser, 2002). Customer satisfaction in finance institute has been intensively studied, so that it is the primary goal of every financial organization and especially banks. Most researchers have found the influence of customer capital on a successful business so that no business my run long without achieving customers satisfaction.

Claes Fornell, a professor at Michigan University, found that the satisfaction of customers could maintain the business relationship, decrease the elasticity of product price, and improve company's prestige (Fornell, 2016). Kaplan and Norton (2004) explain that companies can generate profitable revenue by deepening relationships with existing customers. This enables them to sell more of their existing product or service. So, it can be concluded that customer capital, which is considered as bridge or catalyst in intellectual capital activities, is the dominant and determining factor to change intellectual capital to the market value, accordingly, the company's business performance.

H₇: Customer capital has a positive influence on company performance

3. Research Methods and Materials

This research is using a quantitative approach since it uses numerical data to analyze the information. Quantitative

approach is one in which the investigator primarily uses post-positive claims for developing knowledge (e.g., cause-and-effect thinking, reduction to specific variables and hypotheses and questions, use of measurement and observation), employs strategies of inquiry such as experiments and surveys, and collect data on predetermined instrument that yield statistics data (Creswell, 2003). Type of data used in this research is secondary data based on annual report and audited financial statement of banks listed on Indonesia Stock Exchange (IDX) for years 2017 to 2019. The population consists of 117 banks. Data for this research are generated based on following requirements: 1) Companies in banking are listed on Indonesia Stock Exchange for years 2013 to 2019; 2) It published its human resources profile (total employees and employees demographic) for these years; 3) The bank has positive income for years 2017 to 2019. The criteria are limited only to banking company. This boundary is made to control the variance, caused by the difference of industry characteristic. When the characteristic is different, it cannot represent the growth of the company precisely. There are 75 banks that meet those required criteria.

The exogenous variable in this study is Human Capital (X1). The endogenous variables are Innovation Capital (X2), Process Capital (X3), Customer Capital (X4), and Company Performance (X5). The proxies of human capital are as follow:

$$Total\ Employee_{it} = NEMP_{it} \quad \dots(1)$$

$$Number\ of\ Advanced\ Education_{it} = EDU_{it} \quad \dots(2)$$

$$Ratio\ Advanced\ Education_{it} = \frac{EDU_{it}}{NEMP_{it}} \quad \dots(3)$$

$$Weighted\ Average\ Education_{it} = \frac{(nHX1) + (nDX2) + (nS1x3) + (nS2x4)it}{NEMP_{it}} \quad \dots(4)$$

$$Payroll\ Ratio_{it} = \frac{SALEX_{it}}{NR_{it}} \quad \dots(5)$$

$$Change\ Employee\ Number_{it} = \frac{(EMP_{it}) - (EMP_{it-1})}{NR_{it} - 1} \quad \dots(6)$$

Notes:

NEMP_{it}: Number of employees of company i period t

EDU_{it}: Number of employees which have advanced education of company i period t

nH_{it}: High school employees of company i period t

nD_{it}: Diploma employee of company i period t

nS1_{it}: Graduate employee of company i period t

nS2_{it}: Master and Doctoral degree employee of company i period t

SALEX_{it}: Sales Expense of company i period t

NR_{it}: Net revenue of company i period t

Schneider, Günther, and Brandenburg (2010) shows that better-trained employees will provide firms with more innovative output. The proxies of innovation is,

$$New\ Product\ and\ Service_{it} = TProd_{it} - Tprod_{it-1} \quad \dots(7)$$

Notes:

TProd_{it}: Total product and service of company i period t

TProd_{it-1}: Total product and service of company i period t-1

Assuming higher turnover rates represent more efficient operation processes (Cheng et al., 2010), the authors infer that higher turnover rates allow for a reduction in the input costs of maintaining customer relationships, such as selling, advertising, and general administrative expenses (Cheng et al., 2010). Process capital measured by some measurements is as follow:

$$Productivity_{it} = \frac{NR_{it}}{NEMP_{it}} \quad \dots(8)$$

$$Value\ Added_{it} = \frac{NIT_{it}}{NEMP_{it}} \quad \dots(9)$$

$$FAge_{it} = Y_{it} - Y_1 \quad \dots(10)$$

$$Administrative\ Ratio_{it} = \frac{AEX_{it}}{NR_{it}} \quad \dots(11)$$

$$Capital\ Turnover_{it} = \frac{NR_{it}}{TA_{it}} \quad \dots(12)$$

Notes:

NR_{it}: Net revenue in company i period t

NEMP_{it}: Number of employee in company i period t

NIT_{it}: Net income after tax in company i period t

Y_{it}: Year in company i period t

Y1: Establishment year in company i period t

TA_{it}: Total asset in company i period t

Thus, companies often have large budgets for maintaining customer relationships in order to maintain or create a positive customer image (Cheng et al., 2010). Maintaining customer relationships positively affects performance. The indicator of customer capital is:

$$Market\ Share_{it} = \frac{NR_{it}}{TNR_{jt}} \quad \dots(13)$$

Notes:

NR_{it}: Net revenue in company i period t

TNR_{it}: Total Net Revenue in industry j period t

The measurements of company performance are as follow:

$$\text{Return on Asset}_{it} = \frac{OI_{it}}{TA_{it}} \quad \dots(14)$$

$$\text{Return on Equity}_{it} = \frac{OI_{it}}{CS_{it}} \quad \dots(15)$$

$$\text{Capital Adequacy Ratio}_{it} = \frac{OI_{it}}{NS_{it}} \quad \dots(16)$$

Notes:

Olit: Operating Income of company i period t

TAit: Total Asset of company i period t

CSit: Common stockholder's equity of company i period t

NSit: Net Sales of company i period t

Data analysis method used in this study is the Partial Least Square, which is a powerful method of analysis because it does not assume the data must use a certain scale and can use a small sample (Sholihin & Ratmono, 2013). This hypothesis will be tested by using Partial Least Square (PLS), which is based on p-value and then also analyzed the regression coefficients and coefficients of determination. Structural equation model proposed in this study are:

$$\text{Model (1): } IN = \beta_1 HC + e_1$$

$$\text{Model (2): } PR = \beta_2 HC + \beta_3 IN + e_2$$

$$\text{Model (3): } CUS = \beta_4 IN + \beta_5 HC + \beta_6 PR + e_3$$

$$\text{Model (4): } PF = \beta_7 CUS + e_4$$

Notes:

$\beta_1 - \beta_7$: Coefficients

$e_1 - e_4$: Epsilon, residual in each equation

HC :human capital of company i period t

IN: innovation capital of company i period t

PR: process capital of company i period t

CUS : customer capital of company i period t

PF: company performance of company i period t

The decision to accept or not accept the null hypothesis is based on the probability value (p). If the p -value is less than 0.1, the null hypothesis is not accepted and if the value of p is greater than 0.1, the null hypothesis is accepted.

4. Results and Discussion

4.1. Descriptive Statistic

Descriptive statistic explains the highest, lowest, mean and standard deviation for variables in this research. The six indicators for human capital are total employee (HC1), number of advanced education (HC2), ratio of advanced

education (HC3), weighted average education (HC4), payroll ratio (HC5), and ratio of change employee number (HC6). Bank Capital Indonesia (BACA) has the smallest employee number (HC1) with 394 employees in 2013 and the smallest number of advanced educational background (HC2) with 294 employees. Bank Rakyat Indonesia (BBRI) has the largest employee number with 92,574 in 2015. BBRI also has the highest number of advanced educational background with 42.934 employees. Bank Bukopin has the percentage of employees with the highest advanced education; the lowest is Bank Victoria. The highest weighted average of educational background (HC4) is Bank BNI (BBNI) with 2.92.

The bank with the lowest proportion of payroll expense compared to its income (HC5) is Bank OCBC NISP (NISP) with 5% in 2017, while the highest is Bank Bank Capital Indonesia (BACA) with 40% in 2014. In 2018, Bank Tabungan Pensiun Nasional (BTPN) has a huge reduction in employee number by 36%, while Bank Woori Saudara Indonesia (SDRA) has recruited the largest number of employees by 31%.

Innovation capital is measured by the number of new products and services in current year. Bank Danamon Indonesia (BDMN) has the highest number of new products and services (IN) with 40 products in 2017 due to the bank launching services and products for sharia, while some other banks might still develop their products and services so don't have launches.

Bank Central Asia (BBCA) has the best productivity (PR1) and value added (PR2) between the sample in 2019 with value 1996.34(PR1) and 752.05(PR2), while Bank Woori Saudara Indonesia (SDRA) still needs a lot of improvement to enhance their productivity from 97.47. Bank QNB Indonesia (BKSW), which has the lowest value added ratio for 3.81 in 2017.

Bank Windu Kentjana International (MCOR) has the shortest experience as it is listed on IDX (PR3) for five years in 2017, while Bank OCBC NISP (NISP) has the longest experience among the sample with 74 years in 2019. Bank Artha Graha Internasional (INPC) has the lowest administrative ratio (PR4) for 0.001 in 2017, and the highest is Bank Bukopin for 0.52. The effectiveness of process in a bank also can be seen through current capital turnover (PR5) Bank Woori Saudara Indonesia (SDRA) still needs to raise its capital turnover since remaining with the lowest ratio among the sample with 0.01 in 2018. Meanwhile, Bank Danamon Indonesia (BDMN) has the highest capital turnover with 0.12 in 2017.

Considering the market share, which shows whether the bank has strength to attract and maintain their customers, Bank Mandiri (BMRI) has gained the biggest market share to 21.56% in 2019, while Bank Capital Indonesia (BACA) and Bank Woori Saudara Indonesia (SDRA) have the lowest market share in 2018, just 0.8% in 2014.

Return-on-asset (PF1), return-on-equity (PF2), and capital adequacy ratio (PF3) are the measurement for company performance. In 2017, Bank Bukopin (BBKP) has the lowest ROA (PF1) with 0.02%, and the highest in 2014 is Bank QNB Indonesia (BKSW) with 10.5%. Bank QNB Indonesia (BKSW) has the lowest ROE with 0.4% only, while Bank Rakyat Indonesia (BBRI) has the highest ROE with 34%. Bank Mayapada (MAYA) has the lowest capital adequacy ratio (CAR) with 10%, while Bank BumiArtha (BNBA) has the highest CAR with 28%.

4.2. The Result of Confirmatory Factor Analysis

Outer model is evaluated using convergent validity, discriminant validity of the indicators, and composite reliability for the block indicator. Moreover, the inner model is evaluated by looking at the value of R^2 for the dependent latent constructs using Stone-Geisser Q-Squared test. Confirmatory factor analysis is used to calculate the factor scores of Human Capital (HC), Innovation Capital (IN), Customer Capital (CUS) and Company Performance (PF). Here are the results of analysis by using confirmatory factor analysis.

Table 1 shows that Company Performance consists of PF1, PF2, PF3. HC5 (-0.689) and HC6 (-0.211) are the indicators of Human Capital, which the loading factors are below 0.4, hereby it must be excluded from the model. PR4 (-0.621) is an indicator from process capital, which is not adequate as its constructs. Meanwhile, PF3 (0.195) is the indicator from Company Performance, which doesn't meet the requirement of loading factor score, thus it will be excluded from model.

4.3. Measurement Model Assessment (Outer Model)

Table 2 shows that all the indicators have loading factor more than 0.4. Therefore, all the indicators are considered as reliable. To address discriminant validity is comparing whether the average variance extracted (AVE) is greater than the square correlations between the construct and each of the other constructs in the model. Regarding the Average Variance Extracted (AVE) for each construct, all values are above 0.5 (Table 3), which means variance explained by indicators exceeds variance explained by error (Chin, 2010).

Table 1: Evaluation to Confirmatory Factor Model

Criteria	Result		Critical Value	Model Evaluation
Outer Model				
Convergent Validity	Indicator	Loading Factor	≥ 0.4	
	HC1	0.738		
	HC2	0.789		
	HC3	0.782		
	HC4	0.810		
	HC5	-0.698		excluded from model
	HC6	-0.211		excluded from model
	IN	1.000		
	PR1	0.908		
	PR2	0.867		
	PR3	0.491		
	PR4	-0.621		excluded from model
	PR5	0.456		
	CUS	1.000		
	PF1	0.858		
PF2	0.811			
PF3	0.195	excluded from model		

Table 2: Result of Convergent Validity

Criteria	Result		Critical Value	Model Evaluation
<i>Outer Model</i>				
Convergent Validity	Indicator	Loading Factor	≥ 0.4	Good
	HC1	0.784		
	HC2	0.832		
	HC3	0.762		
	HC4	0.811		
	IN	1.000		
	PR1	0.945		
	PR2	0.897		
	PR3	0.507		
	PR5	0.436		
	CUS	1.000		
	PF1	0.843		
	PF2	0.843		

Table 3: The Result of Discriminant Validity

Criteria	Result			Critical Value	Model Evaluation
Discriminant Validity	Variable	AVE	Root square AVE	≥ 0.5	Good
	Human Capital	0.636	0.798		
	Innovation Capital	1.000	1.000		
	Process Capital	0.536	0.732		
	Customer Capital	1.000	1.000		
	Company Performance	0.711	0.843		

Table 4: The Result of Composite Reliability

Criteria	Result		Critical Value	Model Evaluation
<i>Outer Model</i>				
Composite Reliability (pc)	Human Capital	0.875	≥ 0.6	Good
	Innovation Capital	1.000		
	Process Capital	0.807		
	Customer Capital	1.000		
	Company Performance	0.831		

If the square root value AVE of each variable exceeds the other latent variable correlation in the model, then it shows adequate discriminant validity (Chin, 2010). Table 3 shows that all the variables in the model have met the criteria of discriminant validity. Composite Reliability (ρ_c) measures the reliability of a variable. The variable is considered reliable if the value of ρ_c is above the recommended thresholds of 0.6 (Chin, 2010).

Table 4 shows that all the values of composite reliability are above 0.6. Thus, it can be concluded that all variables have met the requirement of composite reliability.

4.4. Structural Model Assessment (Inner Model)

Since the primary objective of PLS is prediction, the goodness of a theoretical model is established by the strength of each structural path and the combined predictiveness (R^2) of its endogenous constructs (Chin, 2010). Chin (2010) suggest that the variance explained (R^2) for endogenous variables should be greater than 0.1. The variance explained for each dependent construct is showed in Figure 2. As can be seen, R^2 of Innovation Capital, Process Capital, Customer Capital, and Company Performance have acceptable levels of explained variance above the 0.1 level. Furthermore, the Stone-Geisser Q^2 test is used to assess the predictive relevance of the endogenous constructs. A Q^2 is greater than 0 implies that the model has predictive relevance, but if a Q^2 is less than 0 suggest that the model lacks predictive relevance (Chin, 2010). Figure 2 shows all the results of Q^2 test are above the recommended threshold of 0, hence the model has an adequate predictive relevance.

The results of partial least square analysis are as follow,

Model (1): $IN = 0.291HC + e_1$
 Model (2): $PR = 0.629HC + 0.163IN + e_2$
 Model (3): $CUS = 0.036IN + 0.605HC + 0.464PR + e_3$
 Model (4): $PF = 0.653CUS + e_4$

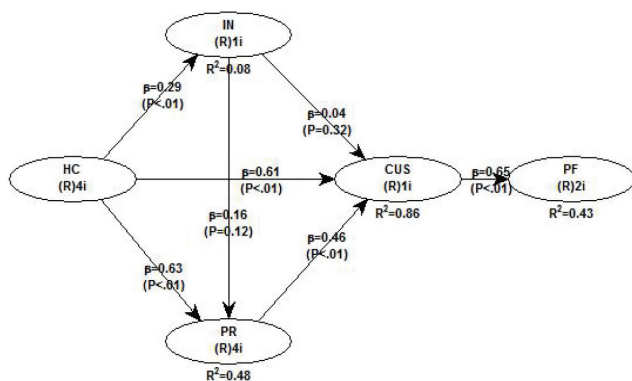


Figure 2: is showing the result from PLS

Notes:

- HC : Human Capital
- IN : Innovation Capital
- PR : Process Capital
- CUS : Customer Capital
- PF : Company Performance

Based on Table 1-5, there are five paths showing a significant effect, while the remaining paths are showing insignificant effect. So, the first hypothesis is accepted; Human Capital (HC) has a positive and significant influence on Innovation Capital (IN), this coefficient indicates that the enhancement in Human Capital (HC) will increase Innovation Capital (IN). Human Capital (HC) has a positive and significant influence on Customer Capital (CUS), it means the second hypothesis is accepted. The path coefficient indicates that the enhancement in Human Capital (HC) will increase Customer Capital (CUS). Human Capital (HC) has a positive and significant influence on Process Capital (PR), so, the hypothesis is accepted. The path coefficient indicates that the enhancement in Human Capital (HC) will increase Process Capital (PR).

Innovation Capital (IN) has no influence on Process Capital (PR). Coefficient indicates that the enhancement in the Innovation Capital (IN) will boost the performance of Process Capital (PR). Innovation Capital (IN) has no significant influence on Customer Capital (CUS), thus the hypothesis is rejected. The coefficient indicates that the enhancement in Innovation Capital (IN) will increase the Customer Capital (CUS). Process Capital (PR) has a positive and significant influence on Customer Capital (CUS), thus, the hypothesis is accepted. The coefficient indicates that the enhancement in Process Capital (PR) will increase the Customer Capital (CUS). Customer Capital (CUS) has a positive and significant influence on Company Performance (PF), so, the hypothesis is accepted. The coefficient indicates that the enhancement in Customer Capital (CUS) will increase the Company Performance (PF).

According to Table 6, there are three indirect effects that have significant influence and the remaining indirect paths are not significant. There is no indirect effect of Human Capital on Process Capital through Innovation Capital as intervening variable. There is indirect effect of Human Capital on Customer Capital through innovation and process capital as intervening variable. There is indirect effect of Human Capital on Company Performance through Customer Capital. There is no indirect effect of Innovation Capital on Customer Capital through Process Capital as intervening variable. There is no indirect effect of Innovation Capital on Company Performance through Customer Capital as intervening variable. There is indirect effect of Process Capital on Company Performance through Customer Capital as intervening variable.

Table 5: The Results of Hypotheses Testing

H	Influence		Path Coeff.	ρ value	Description	
H1	Human Capital	→	Innovation Capital	0.291	0.005	significant***
H2	Human Capital	→	Customer Capital	0.605	0.001	significant***
H3	Human Capital	→	Process Capital	0.629	≤ 0.001	significant***
H4	Innovation Capital	→	Process Capital	0.163	0.116	not significant
H5	Innovation Capital	→	Customer Capital	0.036	0.318	not significant
H6	Process Capital	→	Customer Capital	0.464	0.003	significant***
H7	Customer Capital	→	Company Performance	0.653	≤ 0.001	significant***

Table 6: The Results of Direct and Indirect Effect

Exogen Construct	Effect	Endogen Construct	Intervening Variables	Direct Effect	Indirect Effect	ρ value	Description
Human Capital	→	Process Capital	Innovation Capital	0.629	0.047	0.183	insignificant
Human Capital	→	Customer Capital	Innovation and Process Capital	0.605	0.302	0.004	significant
Human Capital	→	Company Perform.	Customer Capital	0.000	0.395	0.003	significant
Innovation Capital	→	Customer Capital	Process Capital	0.036	0.076	0.143	insignificant
Innovation Capital	→	Company Perform.	Customer Capital	0.000	0.023	0.300	insignificant
Process Capital	→	Company Perform.	Customer Capital	0.000	0.303	0.004	significant

5. Conclusions

The empirical evidences find that causes-and-effect relationships among human capital, innovation capital, process capital and customer capital exist (Bontis et al., 2000; Wang & Chang, 2005). These elements of intellectual capital influence company performance direct or indirectly through their interrelationship. The empirical evidence shows that human capital has positive and significant influence on innovation capital. In this respect, the accumulation of human capital among knowledge workers is necessary for pooling individual cognitive ideas and perspectives to innovate and develop products and services. Human capital has positive and significant influence on customer capital. This research also found that process capital is partial mediation variable for the influence of human capital on customer capital. The more competent employees will provide the better understanding to their customers' needs whether direct or indirectly through process

and innovation, then positively reflect on their mutual relationships. Human capital has positive and significant impact on process capital. Employees provide the quality of service, while implementing internal processes, thus the capability of employees would affect process efficiency, and quality. Thus, the leveraging of human capital helps to create dynamic capabilities whereby the firm is able to renew, augment and adapt its current capabilities to serve continuously changing and new client needs.

The research result shows that innovation capital has no influence on process capital. One possible reason for this may be the fact that the most important dimension of innovation for new banking services and products is the technology that is incorporated in the delivery process. To accommodate new services and products, usually the technology is still difficult to understand by the clients. We also need to consider whether it offers a significant advantage over competition, which is hard for competitors to immediately imitate and so on (Avlonitis, Papastathopoulou, & Gounaris, 2001).

Innovation capital has no significant influence on customer capital. This finding is aligned with Wang and Chang (2005) that customer satisfaction comes from the perceived quality of products or services, which relies on process capital, but not innovation. Thus, innovation capital can influence customer capital through process capital.

The finding of this research is that human capital has positive and significant influence on innovation capital. The higher the efficiency and effectiveness of company process, the higher customer loyalty. The companies that are quickly handling the complaints of customer lead to loyalty and reduce the negative impression by the customer. The empirical evidence shows that customer capital has positive and significant influence on company performance. Customer satisfaction is a key factor in future tendency to make a purchase. In addition, satisfied customer probably talks about their positive purchase experience with others. This enables them to sell more of their existing products or services, which automatically generate more profitable revenue.

There are several limitations of this research. There are some indicators that didn't meet the requirement of CFA. Hence, the analysis of these indicators cannot be continued, and must be excluded from the construction variable. Some measurements like R&D expense, customer acceptance rate, and training number are commonly used by most researchers. However, most bank did not publish these data in their annual report. Researchers should use more comprehensive measurement, both qualitative and quantitative. Hence, future research will produce more comprehensive results.

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