THE IMPACT OF INTELLECTUAL CAPITAL ON THE FINANCIAL PERFORMANCE OF PUBLICLY LISTED INDONESIAN MANUFACTURING COMPANIES

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Abstrak

Tujuan dari penelitian ini ialah untuk menganlisis pengaruh modal intelektual terhadap kinerja keuangan yang diukur dengan rasio *return on assets.* Dalam mengukur modal intelektual, penulis mengadopsi model *Modified Value-Added Intellectual Component (*MVAIC) yang mana komponennya terdiri atas *human capital, structural capital, relational capital,* dan *capital employed.* Sampel penelitian terdiri dari 59 perusahaan manufaktur terbuka yang diobservasi dari tahun 2015 hingga 2018 (n=236). Dataset dianalisis menggunakan regresi panel efek tetap pada Eviews. Berdasarkan hasil regresi, dapat disimpulkan bahwa *human capital, structural capital*, dan *capital employed* berpengaruh positif signifikan terhadap kinerja keuangan. Sedangkan *relational capital* tidak berpengaruh terhadap kinerja keuangan.

Kata kunci: *intellectual capital, human capital, structural capital, relational capital*, kinerja keuangan

Abstract

The purpose of this research is to analyze the influence of intellectual capital on financial performance, which was measured with the return on assets. The components of intellectual capital follow the Modified Value-Added Intellectual Component (MVAIC) model, which consists of Human Capital, Structural Capital, Relational Capital, and Capital Employed. This study uses a sample of fifty-nine publicly listed Indonesian manufacturing companies, which were examined for the period of 2015 – 2018 (n=236). The dataset was analyzed using fixed effect panel regression on Eviews econometrics package. Based on our regression, we find that human capital, structural capital, and capital employed positively impact financial performance. Meanwhile relational capital does not significantly influence financial performance.

Keywords: intellectual capital, human capital, structural capital, relational capital, financial performance

1. INTRODUCTION

The rapid innovation of science and technology has ushered in a new era known as the Industry 4.0. The emergence of this industrial revolution pushes the world into a more knowledge-based economy, i.e. production and consumption activities that are driven by the knowledge of the human resources, or also known as the intellectual capital (Shizha, 2017). This trend brings in the creation of novel products and services and transforms the local market into a global market space (Graham, 1999). The 2015-2019 National Medium-Term Development Plan of Indonesia reveals that investing in human resource development would energize the country's shift from a commodity-based into a knowledge-based economy. This would be expected to increase the country's competitiveness, particularly with the inception of the ASEAN Economic Community. According to the World Bank, the four pillars of the knowledge-based economy are education & training, information infrastructure, economic incentives & institutional regimes, and innovation. These pillars reflect the importance and the role of intellectual capital (IC) in creating a knowledge-based economy.

The three primary constructs of IC are human capital (HC), structural capital (SC), and customer capital (CC) (Stewart, 2010; Draper, 1998). Edvinsson and Malone (1997) define the value of IC as the difference between market value and the book value of a company. Meanwhile, Stewart (1991) define IC as the amalgamation of everybody in a given company that provides a competitive edge in the market, which includes knowledge, information, intellectual property, and experience. IC encompasses human resource capital and structures encapsulated in customers, processes, databases, brands, and systems (Edvinsson & Malone, 1997), which have played an increasingly important role in creating sustainable competitive advantages for companies. A proper IC management will increase value-added that can benefit a company in facing its competitions (Edvinson, 1997). This would then significantly contribute to a company's financial performance (Kehelwalatenna & Gunaratne, 2010).

Bontis et al. (2000) define HC as the individual knowledge stock of an organization that is represented by its employees. SC includes all non-human storehouses of knowledge in an organization. These storehouses include databases, organizational charts, process manuals, strategies, routines, and everything that makes a company's value higher than its material value. Meanwhile, CC or relational capital (RC) is the knowledge inherent in marketing channels and customer relationships that an organization develops through the course of business (Bontis et al., 2000). Previous empirical researches have utilized the intellectual capital model to determine financial performance, however we found several inconsistencies for every component:

Kalkan, Bozkurt, and Arman (2014) found that HC positively affected financial performance in Turkey. This was supported by Al-Musali and Ismail (2014) in Saudia Arabia and Dženopoljac, Janoševic, and Bontis's (2016) in Serbia. However, Winarso and Park (2015) did not find HC to influence financial performance in Indonesia. Moreover, Sirapanji and Hatane (2015) found that HC negatively influenced financial performance of 38 service companies listed on the Indonesian Stock Exchange.

Carlucci, Celenza, and Rossi (2014) found that SC positively affected the financial performance of Italian companies. Similar results were found by Kamath (2015) in India, Dženopoljac, Janoševic, and Bontis (2016) in Serbia, and Andreeva and Garanina (2016) in Russia. However, contrasting results were found by Pratiwi (2017) in Indonesia and Ozkan, Cakan, and Kayacan's (2017) in Turkey. These investigations did not find SC to influence firm performance.

As for relational capital, Ulum et al. (2014) found it to positively influence financial performance. This was supported by the findings of Nimtrakoon (2015) and Ozkan et al. (2017). Whereas Andreeva and Garanina (2016) and Yilmaz and Acar (2018) found relational capital to be an insignificant determinant of financial performance.

Most of the existing researches only measure intellectual capital using the Value-Added Intellectual Coefficient model by Pulic (1998), which consisted of Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE), and Capital Employed Efficiency (CEE). Our investigation would add Relational Capital Efficiency variable, which is derived from Ulum's (2014) Modified Value-Added Intellectual Coefficient (MVAIC) model, to measure intellectual capital more comprehensively.

Due to inconsistent previous empirical findings and the need to confirm usefulness of the MVAIC mode, we would reexamine the effect of intellectual capital on firm financial performance.

2. LITERATURE REVIEW

2.1 Grand Theory

Resource-Based Theory (RBT)

Resource-Based Theory (RBT) was first theorized in 1984 by Wernerfelt (1984). In his article, Wernerfelt combined the idea of distinctive competencies initiated by Selznick (1957) with Penrose's work in 1959 (Penrose & Penrose, 2009) on the 'definition of the firm as a system of productive resources'.

Barney (1991), further developed RBT and stated that these resources, which include all assets, capabilities, organizational processes, company attributes, information, knowledge, and other things controlled by the company, can help companies to formulate and implement strategies to improve efficiency and effectiveness. In the case of intellectual capital, it is a resource, that if properly managed, will become a sustainable competitive advantage that provides value-added and generates excellent long-term performance for the company.

2.2 Hypothesis Development

The Resource-Based theory states that productive resources would sustain a company's long-term performance. The key to a sustainable operation is by recruiting, training, developing, and retaining human resources. Officers and employees are the proverbial backbone of the company who operate the business on a daily basis. Where customers are the source of firm revenue, employees work to keep the internal business process going. Human Capital (HC) has been found

to strongly influence firm performance (Al-Musali & Ismail, 2014; Gogan et al, 2016; Pratiwi, 2017). Ergo, we develop the following hypothesis:

H_1: Human capital positively affects financial performance

Structural Capital (SC) has been found to positively affect financial performance (Carlucci, Celenza & Rossi, 2014; Dženopoljac, Janoševic, & Bontis, 2016; Andreeva and Garanina, 2016). SC consists of the non-physical infrastructure that enables the human resources to function. More investment in SC translates to more support for the human capital to perform. This is expected to further improve the performance of the company.

H_2: Structural capital positively affects financial performance

Relational capital (RE) has been found to positively influence financial performance (Ulum et al, 2014; Nimtrakoon, 2015; Ozkan et al., 2017). The knowledge about customers is crucial for ensuring the sustainability of the company's revenue stream. It is a resource that is expected to secure the acquisition and retention of customers. Therefore, we hypothesize the following:

H_3: Relational capital positively affects financial performance

Capital Employed (CE), as company resource, is expected to add more value to the company because this is direct investment in company assets which are utilized for daily operations. Bontis et al. (2015) found that CE positively influenced financial performance. This is supported by Mustika et al. (2015) and Nimtrakoon (2015). Therefore, we hypothesize the following:

H_4: Capital employed has a positive effect on financial performance

3. METHODS

3.1 Unit of Analysis and Sample

We observe manufacturing companies that were listed on the Indonesian Stock Exchange during 2015-2018. The sampling process is displayed in the following table:

Table 3.1
Sample Selection Criteria

Sample Selection Criteria	Totals
Manufacturing companies listed on the IDX in 2018	177
Companies with unavailable and incomplete data	(23)
Companies going public during observation period	(31)
Companies not disclosing marketing expenses	(8)
Companies with operating losses (negative financial performance)	(32)
Companies reporting in different currencies	(24)
Total samples	59
Periods included	4
Total observations	236

3.2 Model

Panel regression analysis would be used to test the hypotheses in this study. The equation model is as follows:

$$ROA_{it} = \alpha + \beta_1 HCE_{it} + \beta_2 SCE_{it} + \beta_3 RCE_{it} + \beta_4 CEE_{it}$$

ROA_{it} represents the Return on Assets of company *i* in year *t*, HCE_{it} represents the Human Capital Efficiency of company *i* in year *t*, SCE_{it} represents the Structural Capital Efficiency of company *i* in year *t*, RCE_{it} measures Relational Capital Efficiency of company *i* in year *t*, and CEE_{it} represents the Capital Employed Efficiency of company *i* in year *t*. We estimate this equation using panel regression to determine the significance of the effects of our independent

variables on the dependent variable.

$$ROA = \frac{Net\ Income}{Total\ Assets} \qquad HCE = \frac{Value\text{-}added1}{Human\ Capital2} \qquad SCE = \frac{Structural\ Capital3}{Value\text{-}added}$$

$$RCE = \frac{Relational\ Capital4}{Value\text{-}added} \qquad CEE = \frac{Value\text{-}added}{Capital\ Employed5}$$

[1] operating profit + employee costs + depreciation + amortization | [2] total employee costs | [3] Value-added – Human Capital | [4] total marketing costs | [5] book value of total assets

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics Analysis

The results of the descriptive statistical analysis in this study are as follows:

Table 4.1
Descriptive Statistics Analysis.

	ROA	**HC**	**SC**	**RC**	**CE**
Max	0.52670	35.43916	0.97178	1.04390	0.77405
Min	0.00018	1.40434	0.28792	0.00028	0.06158
Mean	0.08447	4.94124	0.70943	0.12866	0.21366
Skewness	2.38791	4.11744	-0.74223	2.58901	2.10128
Std deviation	0.08498	3.99444	0.16079	0.18476	0.12501
Observations	236	236	236	236	236

Return on Assets (ROA) as a measure of financial performance shows a mean value of 0.08447, meaning the average manufacturing company can generate a profit of 8.447% from utilizing its assets. The maximum value of 52.67% belonged to PT Multi Bintang Indonesia Tbk in 2017, and the minimum value of 0.018% belonged to PT Voksel Electric Tbk in 2015.

The first independent variable, Human Capital (HC), was measured with HCE. Its mean value is 4.94124, which means that every Rp1 spent for employee expenses would generate a value-added of Rp4.94124. The observation with the highest value of HCE was PT Nusantara Inti Corpora Tbk. in 2017, whereas the lowest value was PT Pyridam Farma Tbk in 2017.

The second independent variable, Strucutral Capital (SC), was measured with SCE. Its average value is 0.70943, which means that every Rp0.70 investment in SC would increase the value-added of the company by Rp1. The observation with the highest value was PT Nusantara Inti Corpora Tbk in 2017, whereas the lowest value was PT Pyridam Farma Tbk in 2017.

The third independent variable, Relational Capital (RC), which was measured with RCE, has an average value is 0.12866, which means that the average company spent Rp12.866 in marketing-related expenses and resulted in an increase of value-added company by Rp1. The maximum value of 1.0439 belonged to PT Pyridam Farma Tbk in 2015 and the minimum value of 0.00028 belonged to PT Pelangi Indah Canindo Tbk in 2018.

The fourth and final independent variable, Capital Employed (CE) was measured with CEE. This measures how efficient a company manages its physical capital. The mean value of 0.21366 indicates that the average manufacturing company generated a value-added of Rp0.21366 for every Rp1 physical capital investment. The maximum value of 0.77405 belonged to PT Multi Bintang Tbk in 2017 and the minimum value belonged to PT Kabelindo Murni Tbk in 2017.

4.2 Panel Regression Analysis

Table 4.2
Regression Results with ROA as Dependent Variable

Estimation	Pooled OLS	**Fixed Effects Panel**	Random Effects Panel
C	-0.153359 (-12.02787)	-0.128103 (-5.725495)	-0.134920 (-8.202406)
HCE	-0.002257 (-2.947254)***	0.002612 (1.9885542)**	0.000202 (0.211673)
SCE	0.177600 (8.884899)***	0.090342 (2.495570)**	0.134253 (5.369075)***
RCE	-0.040601 (-2.875858)***	0.028024 (0.796198)	-0.025793 (-1.312722)
CEE	0.600033 (30.26142)***	0.617634 (11.55796)***	0.591882 (21.35656)***
F-statistic	304.6276***	69.52314***	158.1054
Redundant fixed effects χ^2 statistic	-	334.716361 (p-value: 0.00)	-
Hausman χ^2 statistic	-	-	11.760632 (p-value: 0.0192)
S.E. of Regression	0.034290	0.019497	0.019822

***, **, and * indicate 1%, 5%, and 10% level of significance, respectively
Periods included: 4 | Cross sections included: 59 | Total balanced observations: 236

Table 4.2 displays a p-value of 0.00 for the Chow test, which indicates that the fixed effects would be chosen over the pooled OLS model. Afterwards, the Hausman test gave a p-value of 0.0192, which led us to keep using the fixed effects regression to test our hypothesis.

1. The effect of human capital on financial performance.

Our regression shows that HC has a positive effect on financial performance. Human capital has a vital role in running the internal business process in the company. A company tends to its employees by rewarding them proper remuneration in the form of salaries, bonuses, post-employment benefits, facilities, trainings, and continuing education. This is done to empower employees and ensure they keep performing to sustain the competitive advantage of the business. This is in line with resource-based theory (RBT), which states that the company has resources that can make the company have a competitive advantage and direct the company to have an excellent long-term performance. This finding corresponds with a study by Kalkan, Bozkurt, and Arman (2014).

2. The effect of structural capital on financial performance.

Structural capital is found to have a positive influence on financial performance. The functional role of SC is to support the work of HC. SC is provided by companies in the form of databases, organizational charts, process manuals, strategies, routines, and information systems that help improve the effectiveness and efficiency of business processes in companies. The force of the Fourth Industrial Revolution has driven the manufacturing companies to revitalize their production processes. As it turns out, investment in SC helps create value-adeed through a more effective and efficient internal business process, which leads to better financial results. This finding supports the Resource-Based theory and is in line with that of Andreeva and Garanina (2016), as well as Dženopoljac, Janoševic, and Bontis (2016).

3. The effect of relational capital on financial performance.

Based on our regression, we find relational capital (RC) to be an insignificant predictor of financial performance.

RC deals with customer knowledge: brand, loyalty, distribution channels, and business collaborations. RC was measured with marketing expenses incurred, i.e. advertising and distribution costs. It may be possible that marketing cost is not the proper proxy for measuring RC in manufacturing companies. These are not the factors that significantly influence customer purchase decision. Customers may consider other factors such as product quality and price instead. Our insignificant finding is in line with the findings of Yilmaz and Acar (2018).

4. The effect of capital employed on financial performance.

Lastly, we find capital employed to positively influence financial performance. The company requires physical capital as the primary resource for daily operations. CE includes all tangible assets owned by the company, such as cash, inventory, and fixed assets. By managing CE effectively and efficiently, the company will be able to increase its productivity and consequently improve its financial performance. A savvy management of CE indicates the company's proficiency in utilizing its physical capital. This finding is in line with the results of Bontis's (2015).

5. CONCLUSION DAN SUGGESTION

5.1 Conclusion

Based on our findings, we conclude human capital, structural capital, and capital employed positively affect financial performance. Meanwhile, RC is found to be an insignificant regressor of financial performance. Our findings highlight the importance of intellectual capital for the performance and sustainability of a company. Proper management of both intellectual and physical capitals are proven to improve the operating profitability of companies. Our findings support Resource-Based theory.

5.2 Limitation

The main limitation of our research is the dataset. We merely observed manufacturing companies for a period of four years. Additionally, we have yet to operationalize the relational capital variable with a more indicative measure. We argue that marketing costs may not completely illustrate the customer relationship perspective of intellectual capital. This may be the reason why in this research, the variable is found to not significantly impact financial performance.

5.3 Suggestion

As the three components of the intellectual capital model are found to significantly impact profitability, then stakeholders should pay more attention to continuously improve and empower them as it would help in assuring the sustainability of the business. Based on our limitations, we would recommend further studies to: (i) investigate industries that possess a more knowledge-based business model such as financial services, and (ii) employ other measures for relational capital.

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