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THE EFFECT OF INTELLECTUAL CAPITAL ON COST STICKINESS: A MODIFIED VALUE ADDED INTELLECTUAL COEFFICIENT (MVAIC) APPROACH

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ABSTRACT

This study aims to provide empirical evidence about the effect of intellectual capital on cost stickiness. Intellectual Capital has been widely studied about its effect on company performance, but still not much has been studied about its effect on cost behavior. Intellectual Capital in this study uses the Modified Value Added Intellectual Capital (MVAIC) approach. The population in this study were all manufacturing companies listed on the Indonesia Stock Exchange (IDX) in 2020. The sample in this study was 119 companies which were selected through purposive sampling. This study uses an ordinary least square regression model. The results of this study indicate that the intellectual capital carried out by the company is able to reduce the level of cost stickiness in manufacturing companies in Indonesia. In practice, the IC carried out by the company is able to reduce cost stickiness, so that it can improve the financial performance of the firm.

KEYWORDS: Cost Stickiness; Intellectual Capital; MVAIC.

INTRODUCTION

Financial statements on a company's balance sheet are not the only basis for creating value. Items that are not listed on a company's balance sheet such as information, knowledge, intellectual property, expertise, systems, and processes also have significant value creation relevance (Haris *et al.*, 2019). In the late 1980s, academics and practitioners began to increase their attention about the importance of recognizing intangible assets, especially Intellectual Capital (IC) in driving firm value and competitive advantage (Ulum, 2017). Intellectual capital (IC) is the total stock of collective knowledge, information, technology, intellectual property rights, experiences, organizational learning and competencies, team communication systems, customer relations, and brands that are able to create value for the company (Stewart, 1997).

In order to survive in an unpredictable business environment caused by changes in technology, product and service innovation and combined with global competition, organizations must have special abilities including the ability to learn and respond flexibly and quickly to technology and market changes through continuous innovation (Banerjee & Srivastava, 2017). Ownership of intangible assets, especially IC, is becoming more important in this modern era where technology and knowledge have an important role in the company's operations (Irsyahma & Nikmah, 2017).

In manufacturing companies, intellectual capital has a positive and significant relationship on the performance of new product development (Chen *et al.*, 2006), IC also plays a role in strengthening manufacturing enterprises for long-term competitive advantage (Phusavat *et al.*, 2011). IC is part of Intangible assets, which according to PSAK 19 intangible assets can be recognized if and only if future economic benefits can be obtained from the asset or the cost of the asset can be measured reliably. The capitalization of intangible assets is associated with market value. In other words, market participants behave as if part of R&D, labor and advertising spending are treated as assets that represent significant future economic benefits for the firm (Sydler *et al.*, 2014).

Intellectual capital (IC) is an intangible asset and is difficult to research or directly measure. Intangible assets are generally the company's intellectual property (such as patents, trademarks, copyrights and others), goodwill and brand recognition. IC is a very valuable asset and is able to provide a competitive advantage in the long term. Astuti (2011) states that IC is elusive, but once discovered and exploited will provide organizations with a new source base to compete and win. IC includes all processes and assets that do not normally appear on the balance sheet and all intangible assets (trademarks, patents, and brands) that are of concern to modern accounting methods. IC can be linked to other disciplines such as corporate strategy and the production of measurement tools. From a strategic perspective, IC can be used to utilize knowledge to increase firm value. On the other hand, the measurement side focuses on how a new reporting mechanism can be built that can measure non-financial, qualitative information, and quantify traditional IC items (Ulum, 2017). Several practitioners have suggested the elements contained in IC. However, of all, there is no definite determination regarding the elements in the IC. Many practitioners state that IC consists of three main elements, namely human capital, structural capital, and relational capital (Chen, 2008; Chu *et al.*, 2006; Herremans *et al.*, 2011; Hsu & Fang, 2009; Namvar *et al.*, 2010; Shih *et al.*, 2009).

Astuti (2011) defines human capital (HC) as the knowledge, skills, and experience that employees bring with them when they leave the company. HC is the lifeblood of intellectual capital. This is the source of innovation and improvement, but it is a

component that is difficult to measure. HC is also a source of very useful knowledge, skills, and competencies in an organization or company. HC reflects the company's collective ability to produce the best solutions based on the knowledge possessed by the people in the company. HC will increase if the company is able to use the knowledge possessed by its employees. Sawarjuwono dan Kadir (2003) provides some basic measurable characteristics of this capital, namely training programmes, credential, experience, competence, recruitment, mentoring, learning programme, individual potential, and personality.

Structural capital (SC) is the ability of an organization or company to fulfill the company's routine processes and structure, which supports employees' efforts to produce optimal intellectual performance, as well as overall business performance, for example: company operational systems, manufacturing processes, organizational culture, management philosophy, and all forms of intellectual property owned by the company. An individual can have a high intellectual level, but if the organization has poor systems and procedures, then IC cannot be utilized optimally. Structural Capital is defined as the knowledge that is in the institution at the end of the working day. It consists of the principles of governance, organizational routines, procedures, systems, cultures, databases, publications, intellectual property, etc (Widyastuti & Aprilia, 2019).

Relational capital (RC) is a harmonious relationship/association network owned by the company and its partners, both from reliable and quality suppliers, from loyal customers and satisfied with the services of the company concerned or from the company's relationship with the company. government and with the local community. RC can emerge from various parts outside the company environment which can add value to the company. RC is defined as all resources associated with the external relations agencies such as the "customer", "supplier", R & D partners, government, etc (Widyastuti & Aprilia, 2019).

IC has been widely studied about its effect on firm performance, but still not much has been studied about its effect on cost behavior. One of the basic principles of cost accounting is divided into fixed and variable costs. While fixed costs, at least in the short run, remain stable, variable costs react to changes in the firm's activity. However, in the phenomenon of cost stickiness, an asymmetric cost movement occurs. Where managers quickly expand resources when demand increases, but for various reasons choose to 'hold on' with unused capacity when sales decline. As a result, costs increase more than they decrease for the same change in activity (Hartlieb *et al.*, 2019). Companies with high revenues, their cost behavior tends to capitalize R&D expenditures from total R&D expenditures so that costs move in the opposite direction to sales (Cheung *et al.*, 2019). Companies that choose a cost-efficiency strategy will provide incentives to managers to meet the company's cost-efficient targets, while companies that choose an innovation strategy will give managers flexibility in determining the company's product innovation. So in a cost-efficiency strategy company, managers are expected to show less asymmetric cost behavior because when sales fall, they must immediately adjust their product costs (Purnamasari & Umiyati, 2019).

Understanding cost behavior is an important element of cost accounting and management (Anderson *et al.*, 2003). The traditional model of cost behavior places a linear relationship between activity and cost. In the short run, total costs equal fixed costs plus variable unit costs \times volume of activity. Since this model is ubiquitous, it is interesting to examine the validity of the simplicity of this specification (Balakrishnan & Gruca, 2008). Variable costs change in proportion to changes in the activity driver, so the magnitude of the cost change

depends only on the rate of change in the level of activity, not on the direction of change (Anderson *et al.*, 2003). The sticky cost literature speculates that the asymmetry arises because of intentional resource commitment decisions made by managers who face adjustment costs, such as hiring and firing costs for labor or installation and disposal costs for equipment (Banker *et al.*, 2013). Some of the reasons for the creation of the phenomenon of cost stickiness are 1) cost adjustments, 2) changes in the amount of economic activity, 3) expectations of future sales 4) studying management decisions (Mohammadi & Taherkhani, 2017).

Previous research related to the relationship between IC and cost stickiness has been carried out by (Mohammadi & Taherkhani, 2017), where IC affects the cost stickiness. In this research, IC is measured by the Value Added Intellectual Capital Coefficient (VAIC) approach. The VAIC model was developed by Pulic in 1997 which is designed to provide information about the value creation efficiency of tangible assets and intangible assets owned by the company (Ulum, 2017). Pulic uses reinterpreted terms compared to Skandia Navigator, pointing to "semantic shift," rather than "conceptual ambiguity." In other words, by drawing on exclusive accounting terms and data it does not directly relate to the language of knowledge management (KM). Therefore, while this VAICTM model can be helpful given the ease of data collection, it may not help in cross-functional integration of topics (Nimtrakoon, 2015).

Previous researchers have shown the limitations of VAIC such as VAIC shows the efficiency of labor and the company's capital investment, and has nothing to do with intellectual capital. In addition, the calculation method uses overlapping variables and has other serious validity issues (Stähle *et al.*, 2011), VAICTM does not measure the IC itself, but measures the impact of IC management (Ulum, 2017). Based on the limitations of VAICTM, Ulum (2014) developed a more comprehensive Modified Value Added Intellectual Capital Coefficient (MVAIC) based on the VAICTM model. This study uses MVAIC to measure Intellectual Capital, so this research contributes how the MVAIC approach has an influence on Cost Stickiness.

Variations in adjustment costs across departments within the organization, fully consistent with the company's resource based view, the dominant paradigm in strategic management research over the last 15 years (Balakrishnan & Gruca, 2008). Resource based view (RBV) is very appropriate to explain research on IC (Ulum, 2017), because one of the categories expressed by RBV talks about intangible assets in which IC is included. There is a close relationship between IC and Cost stickiness above, then the hypothesis of this research is:

H₁: Intellectual Capital affects the level of cost stickiness

METHOD

This study is a quantitative study that analyzes the relationship between intellectual capital and the level of cost stickiness of manufacturing companies in Indonesia. The population in this study were all manufacturing companies listed on the IDX in 2020. The sampling technique in this study uses a purposive sampling method with the following criteria: 1) Reporting detailed financial statements for 2 years, which include (sales cost, general and administration cost, labor cost, depreciation and amortization cost, and total sales).

Measurement of intellectual capital (IC) variables using the Modified Intellectual Capital Value Added Coefficient (MVAIC) approach:

$$\text{MVAIC} = \text{ICE} + \text{CEE}$$

$$ICE = HCE + SCE + RCE$$

$$VA = OP + EC + D + A$$

$$HCE = \frac{VA}{HC}$$

$$SCE = \frac{SC}{VA}$$

$$RCE = \frac{RC}{VA}$$

$$CEE = \frac{VA}{CE}$$

where:

VA : Value Added

OP : operating profit

EC : Employee Cost

D : Depreciations

A : Amortizations

ICE : Intellectual Capital Efficiency

HCE : Human Capital Efficiency

SCE : Structural Capital Efficiency

RCE : Relational Capital Efficiency

CEE : Capital Employed Efficiency

The measurement of the Cost stickiness variable uses the approach used by Aderson (2003), that looking at the data selling costs (S), General Costs (G), and administrative costs (A). An empirical model that allows measurement of the SG&A response to contemporary changes in sales revenue and distinguishes between periods when revenue is increasing and revenue is declining is presented. The interaction variable, Reduced Dummy, takes the value 1 when sales revenue decreases between periods t - 1 and t, and 0 otherwise. Ordinary least square regression model is used for testing the hypothesis in this study so that the stages of data analysis use 2 models, namely:

Model 1:

$$\log \left[\frac{SG\&A_{i,t}}{SG\&A_{i,t-1}} \right] = \beta_0 + \beta_1 \log \left[\frac{Revenue_{i,t}}{Revenue_{i,t-1}} \right] + \beta_2 * Decrease_Dummy_{i,t} * \log \left[\frac{Revenue_{i,t}}{Revenue_{i,t-1}} \right] + \varepsilon_{i,t}$$

The Coefficient β_1 is the percentage increase in SG&A when income increases by 1%. Meanwhile, to measure the change in SG&A when income decreases by 1%, namely by adding up the coefficients $\beta_1 + \beta_2$, this is because the decrease dummy is worth 1 when income decreases. It is said that there is a sticky cost if the SG&A variation with an increase in income is greater than when it experiences a decrease in income. To test whether intellectual capital has an impact on cost stickiness using the following model:

Model 2:

$$\log \left[\frac{SG\&A_{i,t}}{SG\&A_{i,t-1}} \right] = \beta_0 + \beta_1 \log \left[\frac{Revenue_{i,t}}{Revenue_{i,t-1}} \right] + \beta_2 * Decrease_Dummy_{i,t} * \log \left[\frac{Revenue_{i,t}}{Revenue_{i,t-1}} \right] + \beta_3 * \log \left[\frac{Revenue_{i,t}}{Revenue_{i,t-1}} \right] * \log \left[\frac{MVAIC_{i,t}}{MVAIC_{i,t-1}} \right] + \varepsilon_{i,t}$$

The level of asymmetry increases (decreases) seen from the value of β_3 is it negative or positive.

RESULTS AND DISCUSSION

Table 1 shows the descriptive statistics of the research variables. The average SG&A variable is -0.00001 with a standard deviation of 0.3279, where the minimum value of SG&A is -3.3884 and the maximum value is 0.5661. The average of the Revenue variable is 0.05446 with a standard deviation of 0.3508, where the minimum value of Revenue is -1.7003 and the maximum value is 3.0103. The average Intellectual Capital variable using the MVAIC approach is -0.06194 with a standard deviation of 0.2902, where the minimum MVAIC value is -1.4725 and the maximum value is 1.3794. Companies that experienced a decrease in revenue by 15.12% of the total 119 samples, while companies that experienced a decrease in SG&A by 36.13% of the total 119 samples.

Person Correlation between variables can be seen in table 2, where the relationship between research variables changes in SG&A costs with changes in Revenue variables is significant at the 10% level, while the others are significant at the 5% level. This also shows that between research variables there is no multicollinearity problem. Based on table 3, it can be seen that 1 is 0.0425 which indicates that when income increases by 1%, the cost of SG&A will also increase by 0.04%. While the result of 2 is 0.3403, and if the sum ($\beta_1 + \beta_2$) is 0.3828, this shows that the cost of SG&A will decrease by 0.38% when revenue decreases by 1%. The regression results show that there is no cost stickiness in manufacturing companies in Indonesia in 2017-2018, this is indicated by the increase in SG&A when revenue increases is smaller than the decrease in SG&A when revenue decreases.

Based on table 4, it can be seen that intellectual capital has a significant effect on cost stickiness, this is indicated by a probability of 0.000. With a negative coefficient β_3 (-9.2555) which means that it has a negative effect. From the value of β_3 in table 4, it can also be concluded that when intellectual capital increases by 1%, the cost stickiness also decreases by -9.25%.

	Mean	Std. Dev.	Min	Max
$\log \left[\frac{SG\&A_{i,t}}{SG\&A_{i,t-1}} \right]$	-0,00001	0,3279	-3,3884	0,5661
$\log \left[\frac{Rev_{i,t}}{Rev_{i,t-1}} \right]$	0,05446	0,3508	-1,7003	3,0103
$\log \left[\frac{MVAIC_{i,t}}{MVAIC_{i,t-1}} \right]$	-0,06194	0,2902	-1,4725	1,3794

Table 1.
Distribution
SG&A,
Revenue, and
IC

	$\log \left[\frac{SG\&A_{i,t}}{SG\&A_{i,t-1}} \right]$	$\log \left[\frac{Rev_{i,t}}{Rev_{i,t-1}} \right]$	$Dec * \log \left[\frac{Rev_{i,t}}{Rev_{i,t-1}} \right]$	$Dec * \log \left[\frac{Rev_{i,t}}{Rev_{i,t-1}} \right] * \log \left[\frac{MVAIC_{i,t}}{MVAIC_{i,t-1}} \right]$
$\log \left[\frac{SG\&A_{i,t}}{SG\&A_{i,t-1}} \right]$	1,0000			
$\log \left[\frac{Rev_{i,t}}{Rev_{i,t-1}} \right]$	0,1585*	1,0000		
$Dec * \log \left[\frac{Rev_{i,t}}{Rev_{i,t-1}} \right]$	0,2211**	0,5802**	1,0000	
$Dec * \log \left[\frac{Rev_{i,t}}{Rev_{i,t-1}} \right] * \log \left[\frac{MVAIC_{i,t}}{MVAIC_{i,t-1}} \right]$	0,4520**	0,2884**	0,5414**	1,0000

Table 2.
Pearson
Correlation

Note : * significant at 10%, ** significant at 5%

Model (1)

$$\log \left[\frac{SG\&A_{i,t}}{SG\&A_{i,t-1}} \right] = \beta_0 + \beta_1 \log \left[\frac{Revenue_{i,t}}{Revenue_{i,t-1}} \right] + \beta_2 * Decrease_Dummy_{i,t} * \log \left[\frac{Revenue_{i,t}}{Revenue_{i,t-1}} \right] + \varepsilon_{i,t}$$

	Predicted Sign	Coefficient	T	Prob
β_0		0,0091	0,29	0,772
β_1	+	0,0425	0,41	0,683
β_2	+	0,3403	1,75	0,082
F-Value	3,07			
Prob (F)	0,0503			
Adjusted R ²	0,0339			

Table 3.
Regression
Result Model
(1)

Model (2)

$$\log \left[\frac{SG\&A_{i,t}}{SG\&A_{i,t-1}} \right] = \beta_0 + \beta_1 \log \left[\frac{Revenue_{i,t}}{Revenue_{i,t-1}} \right] + \beta_2 * Decrease_Dummy_{i,t} * \log \left[\frac{Revenue_{i,t}}{Revenue_{i,t-1}} \right] + \beta_3 * \log \left[\frac{MVAIC_{i,t}}{MVAIC_{i,t-1}} \right] + \varepsilon_{i,t}$$

	Prediction Sign	Coefficient	T	Prob
β_0		0,0387	1,70	0,093
β_1	+	0,0132	0,18	0,860
β_2	+	1,1373	7,13	0,000
β_3	-	-9,2555	-10,42	0,000
F-Value	40,11			
Prob (F)	0,0000			
Adjusted R ²	0,4986			

Table 4.
Regression
Result Model
(2)

Based on these results, it can be concluded that the intellectual capital carried out by the company is able to reduce the level of cost stickiness in manufacturing companies in Indonesia. Companies that spend on intellectual capital are able to provide better performance, this is in line with Inkinen (2015) research that IC can affect company performance through interaction, combination and mediation. The results of this study differ from those of Mohammadi & Taherkhani (2017) where IC has a positive effect on cost stickiness. In manufacturing companies in Indonesia there is no cost stickiness, this is because manufacturing companies are not separated into certain sectors whose results are in line with research conducted by Xu & Sim (2017) which examined manufacturing companies in China. Manager manufacturing company in Indonesia tend to consider the best compensation than do asymmetry costs. The results of this study show empirical evidence that if the company is able to optimize its intellectual capital, then in the future it will have a positive impact on the company in this case is the lack of asymmetry of cost behavior.

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CONCLUSION

This study investigates the relationship between intellectual capital and cost stickiness in manufacturing companies listed on the Indonesia Stock Exchange (IDX) in 2020. The

results show that there is no cost stickiness in manufacturing companies in Indonesia, this is evidence by the existence of cost behavior when revenue increased 1% cost of SG&A increased by 0.04%, whereas when revenue decreased 1% cost of SG&A decreased 0.38%. Manager manufacturing company in Indonesia tend to consider the best compensation than do asymmetry costs. Intellectual capital has a significant effect on cost stickiness, but the effect is negative. This shows that the Intellectual Capital in the company is able to minimize the cost stickiness.

There are limitations in this study, namely the year of observation in this study was only carried out for two years, besides that in this study only manufacturing companies were the object of research. Other industrial sectors may have different results, this is possible because the manufacturing industry in Indonesia is mostly in the form of variable costs. Suggestions for further research is to be able to test in other industrial sectors and the year of observation is more than two years.

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