

# THE INFLUENCE OF INTELLECTUAL CAPITAL ON FIRM VALUE WITH EARNINGS MANAGEMENT AS A MODERATING VARIABLE: A STUDY IN FINANCIAL SERVICE COMPANIES LISTED ON INDONESIA STOCK EXCHANGE (IDX)

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## Abstract

*This research aims to examine the influence of intellectual capital performance on firm value and the moderating influence of earnings management on the relationship of intellectual capital with firm value in financial service companies listed on the Indonesia Stock Exchange during 2015 – 2018. Based on the population of 90 companies per year, a test of 69 sample companies that met the criteria of purposive sampling was conducted. The panel data regression technique is used to analyze the data. The findings show that intellectual capital provides a significant positive influence on firm value. Most notable contributions came from human capital and relational capital components, but not the structural capital component. This condition is considered good, although not ideal yet. Other findings reveal that earnings management did not moderate the relationship of intellectual capital with firm value.*

**Keywords:** earnings management; firm value; intellectual capital; Indonesia stock exchange.

## INTRODUCTION

Financial services companies play a strategic role in building a stable financial system in Indonesia. This is due to their abilities to absorb, allocate and utilize productively various sources of funds that contribute to the development of real sector activities (Kasmir, 2014). Financial services companies success is determined by two aspects, First, externally, such as the rapid digitalization of the financial sector, monetary policy, as well as economic situation (domestic and international), and Second, internally, such as quality of performance, professionalism, implementation of strategy, productivity, and company value (Saunders, 2004).

The ability of companies to create competitive advantages based on their resources requires innovative thinking and effective use of modern information technology (Heisig et al., 2016). Companies should strive to build

competitive advantages by utilizing the power of intellectual capital with the aim to increase firm value. Intellectual capital is a company asset categorized as intangible assets that can not be easily disclosed in the financial position statement (Krstić & Bonić, 2016). Thus, it is necessary to measure the performance of intellectual capital to determine its contribution to increasing the firm value along with developing the company. However, research on the measurement of intellectual capital is still very limited in Indonesia, without an exception of the existence of universal measurement of its elements that can be used as a standard (Inkinen, 2015; Rasmini et al., 2016). As a resource possessed by the company which includes three components, namely human capital, structural capital, and relational capital, intellectual capital becomes essential to increase the firm value,

moreover in today's competitive era (**Forté et al., 2017**).

According to Chen et al. (2005) through proper use, intellectual capital is predicted to be capable of increasing the firm value which is reflected in company stock price. Toms (2010) stated that the firm value is the price that buyers are willing to pay at the time the company is sold. It includes nominal value, intrinsic value, book value, and liquidation value all of which boils down to market value.

Although intellectual capital is predictably able to increase the firm value, several prior studies did not always find similar findings. A research conducted by Hejazi et al. (2016) in Iran found that intellectual capital has a significant positive effect on firm value. However, Rezaei's (2013) research based in Iran revealed different findings that intellectual capital provides a non-significant negative effect on firm value. Meanwhile, to the extent of our knowledge, research about the intellectual capital effect on the firm value of financial services companies listed on the Indonesia Stock Exchange has never been conducted.

In addition to increasing competitive advantage, companies also strive to increase the firm value through the realization of maximum earnings quality. In this case, the manager will make an effort to achieve profitability according to the planned target. That is why the quality of earnings is important in the presentation of financial information that can be very useful in economic or investment decision-making (Chan et al., 2006). Nevertheless, the dynamics of company management show that preferable quality of earnings can not always be achieved in reality. This means if in a condition, managements fail to attain the specified profit target, then they will likely utilize the flexibility allowed by accounting standards in preparing modified financial statement appearance, especially the one containing earnings information (**Cohen & Zarowin, 2010**).

As stated by Fields et al. (2001) earnings management is an accounting practice performed by managers, as they modify the level of earnings in financial statements, with the aim to stabilize company profitability, which will lead to stable firm value. As well, Siallagan & Machfoedz (2006) mentioned that earnings management as an act of management in increasing or decreasing profits made in accordance with generally accepted accounting principles in order to achieve the expected level of reported earnings by the means of accounting modification. Regardless of the positive objective of earnings management, the earnings presentation in the financial statements as a result of this practice is, in fact, different from the real company financial condition (**W. R. Scott, 2000**).

For instance, there is a tendency for the influence that can decrease the positive relationship, predictably, of intellectual capital and firm value. This is indicated by research performed by Sial et al. (2018) in China that revealed that earnings management moderates the relationship of CSR disclosure and financial performance negatively, as well as Hasya Arsitarni & Fuad (2018) which showed that earnings management negatively moderates the positive influence of CSR disclosure on firm value.

The present research has two objectives, namely: First, measuring the effect of intellectual capital on firm value, including the contribution of its elements, and Second, measuring the moderation level of earnings management on the relationship of intellectual capital with firm value. Therefore, the research findings can be used as evaluation material to improve intellectual capital management as a constructive strength, as well as to use earnings management based on target and momentum, specifically in financial services companies listed on the Indonesia Stock Exchange.

## LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

This research uses agency theory as a basis for formulating theoretical-tentative answers. In accounting literature, agency theory began to be developed around 1970 by Jensen and Meckling. It explains a relationship between shareholders (principals) and managers (agents) based on a contract with an aim to achieve company goals. Each party has a different role and position, but basically, both have a common interest in developing a company, which is to achieve the welfare of shareholders and managers (Gray et al., 1997). Further, Jensen & Meckling (1976) explained that through a contract containing substance and the mechanism of authority delegation from shareholders (principals) to managers (agents) in managing the company, agency theory highlights the importance of building harmonious relationships through the existence of symmetrical information between both parties, in order to accelerate the realization of company's goals.

Anatolievna Molodchik et al. (2014) mentioned that intellectual capital consisting of elements of knowledge relating to employees (human capital), knowledge concerning the formation and expansion of marketing networks with customers or other external parties (relational capital), and knowledge relating to the development of company's organizational structure (structural capital). These three elements form the strength of a company that combines intelligence and expertise, thus, they become the necessities to improve the performance and profitability needed to increase the company value.

The description of the importance of building a harmonious relationship between shareholders (principals) and managers (agents), explains the existence of intellectual capital that becomes a functional instrument in increasing firm value, as a form of mutual interest between shareholders (principals) and managers

(agents) in achieving company goals. The contract implementation will only work optimally when fairness and transparent relationship is established between shareholders and managers so that both can lead to the same interests, which is to develop the company with an ending goal of welfare improvement. In this case, both parties need to focus on solving external problems together, such as competition between companies, constantly changing economic policies, and the winning business strategy with a focus on increasing company value (Baiman, 1990). The conditions that explain the influence of intellectual capital in increasing company value are also found in several prior studies (Hejazi et al., 2016; Prasetyanto & Chariri, 2013; Rezaei, 2013; Smriti & Das, 2018; Ihyaul Ulum, 2017).

Agency theory also explains that the pattern of authority delegation from shareholders (principals) to managers (agents), bears the likelihood of occurrence of a risk, this can happen in a situation when managers act not in accordance with the interests of shareholders. In this case, managers possess more comprehensive and detailed information about the company, since they are the ones who manage the company every day, compared to the shareholders. Such conditions, creating asymmetric information because the weakness of shareholders is seen and then used by managers to take actions that are concealed from the shareholders. Managers have both the ability and opportunity to provide information that is not in accordance with the company real condition to shareholders, one of them is about the company's profitability target achievement, even though in reality it did not happen (Eisenhardt, 1989).

Jensen & Meckling (1976) specified the impact of asymmetric information on the emergence of 2 types of potential conflicts between shareholders as delegator and managers as the delegated and executors. Shareholders and

management conflict will lead to agency cost of equity and agency cost of debt. Moreover, this conflict can harm the company in the form of moral hazard and adverse selection.

Earnings management is a practice of modifying financial statements' appearance by managers. This practice is deemed possible in positive accounting theory and aims for the benefit of the company. Although managers can actually perform it based on self-interest reasoning. Earnings management is generally carried out by managers without the best knowledge of the shareholders (Roychowdhury, 2006). The basic consideration of the practice implementation is when the managers can not manage to achieve the planned profit target. Therefore, it is conducted with the hope of fulfilling the target as well as

helping the next year's profit target realization.

Despite the fact that managers engage in earnings management practice with an aim to increase firm value, as it is the benefit of the company. Still, there is a likelihood for the opposite results to occur, bearing in mind the financial statements of earnings management results do not convey the real financial conditions of the company. This is shown by the results of several prior studies (Arsitarini & Fuad, 2018; Sial et al., 2018; Tandry et al., 2014). These studies revealed that earnings management negatively moderates the positive effect of CSR disclosure towards firm value.

The illustration based on the literature review discussion above can be seen in Figure 1, Theoretical research Framework, as follows:

**Figure 1**  
**Theoretical Research Framework**

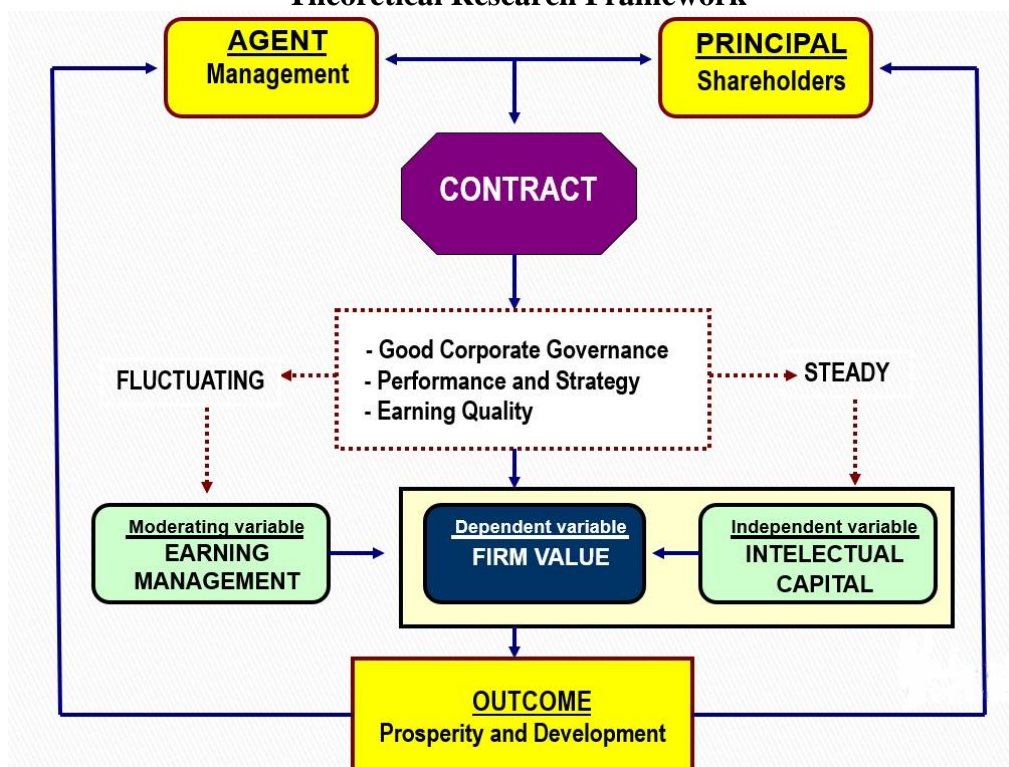


Figure 1 on the above represents the agency theory for: (1) the relationship model between intellectual capital and firm value is illustrated when the relationship between managers and shareholders works based on symmetrical

information, and (2) the model of the moderating influence of earnings management on the relationship of intellectual capital and company value is illustrated when information asymmetry occurs between managers and



shareholders. The occurrence of asymmetry information needs to be prevented and refined through the enhancement of supervision of the board of commissioners and the implementation of the principles of good corporate governance (accountability, transparency, and responsibility) for management, shareholders, creditors, employees, and other stakeholders.

In consonance with the results of several prior studies and explanations of agency theory regarding the relationship model of intellectual capital with firm value, good management of intellectual capital consisting of elements of human capital, structural capital, and relational capital, is a predictable competitive strength that, predictably, can increase the firm value and attract investors (Berzkalne & Zelgalve, 2013). Similarly, the strength of a company's intellectual capital is reflected in the credible financial statements that are able to meet the information needed by investors and responded positively by the market, thereby making the firm's value increase (Whiting & Miller, 2008). Hence, we formulate H1: Intellectual capital has a significant positive effect on firm value.

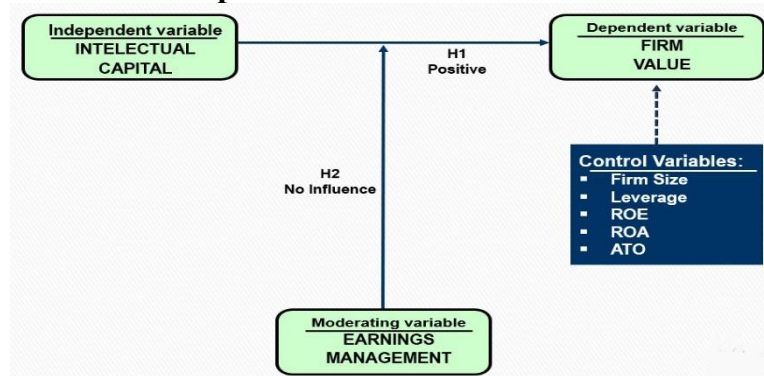
On the basis of the agency theory review regarding the earnings management moderation along with the results of prior studies, Salehi et al. (2018) described that the company's steady profit increase is a good indication of the company, which means that the demand for stocks increases. However, there are times when

managers feel it difficult to realize the profitability according to the target. As the company fails to achieve the expected profit, then the managers engage in earnings management practices by enhancing the financial statements' appearances, with a focus on obtaining the expected profit. Furthermore, Scott (2011) divided earnings management for opportunistic purposes that prioritize the interests of managers or for efficiency purposes which prioritize the interests of the company.

Earnings management is an act of modification of financial statements that should be carried out based on Generally Accepted Accounting Principles, so as to produce better earnings reporting, which in fact, not the same as the company's real short-term income. Therefore, within a certain period, financial reporting made by earnings management practice must be adjusted to the company's actual income (Ronen & Yaari, 2008). Earnings management has a good purpose for the benefit of the company. But earnings management itself is the presentation of financial information that is different from the real situation (Nurjanati & Rodoni, 2015). Hence, we formulate H2: earnings management does not moderate the influence of intellectual capital with firm value.

The formulation of H1 and H2 is depicted in Figure 2, the relationship model between the research variables below

**Figure 2**  
**The Relationship Model Between The Research Variables**



The four variables in Figure 2 above form two relationship models, namely: (1) the positive effect of intellectual capital on firm value, (2) the non-existence of earnings management moderating effect on the relationship of intellectual capital and firm value. In implementing these two relationship models, firm size, leverage, ROE, ROA, and ATO are employed as the control variables to improve the models' accuracies.

## RESEARCH METHODS

### 3.1 Population and statistical sampling

The population of this research consists of all listed financial services companies on the Indonesia Stock Exchange (IDX) over the period of 2015 – 2018, amounted to 90 companies each

year. The sample is determined using a purposive sampling method based on the following criteria:

- Companies should publish audited financial statements at the end of each year (31<sup>st</sup> December) and not later than the end of the March of the following year;
- Registered annually on the IDX during the period 2015 - 2018;
- Meet the criteria number 1 and number 2, and disclose data needed to operationalize research variables.

According to the criteria mentioned above, the number obtained for the statistical sample for each year is 69 companies. Table 1 shows more detailed information regarding the purposive sampling process and result.

**Table 1**  
**Summary of research sample companies**

<i>Limitations</i>	<i>The number of companies</i>	
	<i>Each year</i>	<i>2015 - 2018</i>
Total research population	90	360
Total companies that did not meet the 2nd criteria	11	44
Total companies that did not meet the 3rd criteria	10	40
Total companies that met the criteria	69	276

### 3.2 Research Variables

#### 3.2.1 Independent Variable

The performance of intellectual capital is measured using the Modified Value-Added Intellectual Coefficient (MVAIC). MVAIC is a financial valuation of the components of intellectual capital that can be obtained from the company's financial statements and is a comprehensive modification based on the VAIC<sup>TM</sup> model created by Pulic in 2000 (Ihyaul Ulum, 2015, 2017). The modification focused on the calculation of relational capital performance which is not included in VAIC<sup>TM</sup> does exist in the MVAIC model. This is in line with the description brought by The Chartered Institute of Management Accountant (2009), that intellectual capital is an institutional resource that consists of three elements, they are human capital, structural capital, and relational capital.

The process of computing MVAIC involves six steps.

1. Calculate the company's ability to create value-added (VA) by the following equation:

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

1. Determine the relationship between VA and capital employed efficiency (CEE), which serves as an indicator for VA formed from physical and financial capital units. Pulic (2000) argued that the computation of intellectual capital efficiency must be combined with physical and financial capitals in order to get a broad view of the efficiency of all company resources. The CEE is defined as:

$$CEE = VA/CE$$

2. Determine the relationship between VA and human capital (HC) which is based on employee expenses as an indicator of company investment in

human resources, converted in human capital efficiency (HCE), defined as:

$$HCE = VA/HC$$

3. Determine the relationship between VA and structural capital (SC) represents the company supportive infrastructure which comprises of organizational, expressed in structural capital efficiency (SCE), as follows:

$$SCE = SC/VA$$

4. Determine the relationship between VA and relational capital (RC). Relational capital efficiency (RCE) is based on marketing expenses and is used to determine the company investment contribution in the RC field to create value-added (Ihyaul Ulum, 2015). RCE computation is as follows:

$$RCE = RC/VA$$

5. Finally, the MVAIC is computed as below:

$$MVAIC = CEE + HCE + SCE + RCE$$

Where:

OP= operating profit; EC= employee cost; D= depreciation; A= amortization; CE= capital employed (total assets); HC= human capital (employee expenses); SC= structural capital (VA – HC); RC= relational capital (marketing expenses).

*3.2.2 Dependent Variable*

Firm value is measured using Tobin's Q ratio raised in 1969 by James Tobin. Q ratio calculates market value by predicting the company's future investment. As a financial market calculation, the Q ratio gives managers an indication of investor evaluations of the company's past performance as well as prospects for the company's future performance (Tobin, 1969). Q ratio is deemed able to provide the best financial information because it can explain the different phenomenon in the company, including the existence of diverse decision making and differences in cross-sections in terms of investment, as well as the relationship between the shares owned by management with the firm value, the relationship between company performance and earnings acquisition,

funding policies, dividends and compensation (Sukamulja, 2004). Measurement formula as follows:

$$TBQ = \frac{MVE + DEBT}{TA}$$

Where:

MVE= market value of equity; DEBT= liability; TA= total assets.

*3.2.3 Moderating Variable*

This research uses accrual earnings management with a proxy of discretionary accruals (DAC) which is a financial engineering activity performed by managers through the data in company financial statements (Enomoto et al., 2015). DAC is measured by a modified Jones model that functions to estimate accrual figures derived from the difference between changes in income, accounts receivable, levels of property, plant, and equipment (Dechow et al., 1996). The modified Jones model has adequate feasibility to measure earnings management (Dechow & Dichev, 2002).

The computation includes four steps, as follows:

1. Compute the total accrual (TAC):  
TAC = net income – cash flow of operating activities
2. Compute the estimated accrual value by the equation of Ordinary Least Square (OLS) regression, defined as below:  
 $(TAC_{it}/A_{it} - 1) = \alpha_1(1/A_{it} - 1) + \alpha_2(\Delta REV_{it} / A_{it} - 1) + \alpha_3(\Delta PPE_{it} / A_{it} - 1) + \varepsilon$
3. Measure the value of nondiscretionary accrual (NDA) with regression coefficients based on step 2 computation results, the equation is expressed as:  
 $DA_{it} = \alpha_1(1/A_{it} - 1) + \alpha_2[(\Delta REV_{it} - \Delta REC_{it}) / A_{it} - 1] + \alpha_3(\Delta PPE_{it} / A_{it} - 1)$
4. Finally, compute the discretionary accrual (DAC) with the following equation:  
 $DAC_{it} = (TAC_{it}/A_{it} - 1) - NDA_{it}$

Where:

$DAC_{it}$  = discretionary Accruals of company  $i$  during the period  $t$ ;  
 $NDA_{it}$  = nondiscretionary Accruals of company  $i$  during the period  $t$ ;  
 $TAC_{it}$  = total accrual of company  $i$  during the period  $t$ ;  
 $A_{it-1}$  = total assets of company  $i$  during the period  $t-1$ ;  
 $\Delta REV_{it}$  = revenue of company  $i$  during the period  $t$  less the company revenue during the period  $t-1$ ;  
 $PPE_{it}$  = fixed assets of company  $i$  during the period of  $t$ ;  
 $\Delta REC_{it}$  = receivable of company  $i$  during the period  $t$  less the company receivable during the period  $t-1$ ;  
 $\varepsilon$  = error.

### 3.2.4 Control Variables

Control variables function to appropriately maintain the results of the relationship between other operational variables. This research uses five control variables namely company size (Alipour, 2012), leverage (Ozkan et al., 2017), return on equity (Shiu, 2006), return on assets (Nimtrakoon, 2015), and asset turnover (Mondal & Ghosh, 2012). The equations for calculating these variables based on prior studies follow:

1. Firm size =  $\ln(\text{Total Assets})$
2. Leverage =  $\frac{\text{Total Debts}}{\text{Total Equity}}$
3. Return on Equity (ROE) =  $\frac{\text{Net Income (Annual)}}{\text{Total Shareholders' Equity}}$
4. Return on Assets (ROA) =  $\frac{\text{Net Income (Annual)}}{\text{Total Assets}}$
5. Assets Turnover Ratio (ATO) =  $\frac{\text{Sales Revenue}}{\text{Total Assets}}$

### 3.3 Data Analysis Method

This research is carried out based on a quantitative analysis technique. Hypothesis testing utilizes multiple linear regression models. A panel data is chosen because of the data are the combination of

time series and cross-sections. Statistical analysis is performed by using E-Views (Econometrics and Statistics Software). Baltagi (2005) claimed that the analysis with panel data provides several notable advantages, such as higher variability, a lower level of colinearity, and an increased degree of freedom. There are three methods to estimate model parameters with panel data, namely: (1) common effect model, (2) fixed-effect model, and (3), random effect model. The best of the three models is determined through a series of tests which include chow test, Hausman test, and Lagrange multiplier test.

The equation of regression models are expressed below:

1. The first regression equation is meant for the first hypothesis, which aims to examine the relationship between firm value (TBQ) as the dependent variable and performance of intellectual capital (MVAIC) as the independent variable. Additionally, it is also important to know to the extent which MVAIC components that have the most influence on firm value. Based on this, the first regression will be divided into two equations, model 1A and model 1B. Written as follows:

#### Model 1A:

$$TBQ_{it} = \alpha + \beta_1 MVAIC_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 ROE_{it} + \beta_5 ROA_{it} + \beta_6 ATO_{it} + \varepsilon$$

#### Model 1B:

$$TBQ_{it} = \alpha + \beta_1 CEE_{it} + \beta_2 HCE_{it} + \beta_3 SCE_{it} + \beta_4 RCE_{it} + \beta_5 SIZE_{it} + \beta_6 LEV_{it} + \beta_7 ROE_{it} + \beta_8 ROA_{it} + \beta_9 ROE_{it} + \varepsilon$$

2. The second regression equation is meant for the second hypothesis, which aims to examine the relationship between firm value (TBQ) as the dependent variable and performance of intellectual capital (MVAIC) as an independent variable, with the interaction of earnings management and intellectual capital (DAC\*MVAIC) as a moderating variable. Therefore, the moderated regression analysis is used in this



model. The model is written as follows:

Model 2:

$$TBQ_{it} = \alpha + \beta_1 MVAIC_{it} + \beta_2 DAC_{it} + \beta_3 MVAIC_{it} * DAC_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 ROE_{it} + \beta_7 ROA_{it} + \beta_8 ATO_{it} + \varepsilon$$

Accordingly, there are five control variables that are employed in all regression models, they are firm size, leverage, return on equity, return on assets, and asset turnover.

## RESULTS AND DISCUSSION

### 4.1 Descriptive statistics analysis data

**Table 2**  
**Descriptive statistics**

Variable	Mean	Median	Maximum	Minimum	Std. Dev.
TBQ	2.0221	1.8325	19.871	0.0168	1.7623
CEE	0.4899	0.4378	1.8952	-1.0896	0.3622
HCE	4.2747	4.0050	18.0450	-6.2341	3.0210
SCE	0.7397	0.7627	6.7519	-4.0934	0.6555
RCE	0.0514	0.0153	1.7444	-1.1769	0.2230
MVAIC	5.5557	5.2407	20.0257	-6.1790	3.3072
DAC	-0.0922	-0.0021	0.8634	-3.5599	0.4208
MVAIC*DAC	-0.2091	-0.0018	6.4173	-10.256	1.4266
SIZE	30.0262	29.9507	34.7218	24.6750	2.1522
LEV	1.0830	0.4889	7.4262	0.0001	1.4338
ROE	0.0439	0.0674	0.3484	-1.3253	0.1855
ROA	0.0166	0.0130	0.1565	-0.1163	0.0352
ATO	0.1542	0.1100	0.6500	-0.0300	0.1167

Table 2 above exhibits the results of descriptive statistics for the research variables. The mean value of firm value (TBQ) equivalent to 4 periods is 2.0221. A Q ratio score above 1 indicates an overvaluing for the company's stocks, which means theirs are more expensive than the replacement costs for assets, which is able to stimulate new investment (Sudiyatno & Puspitasari, 2010). Based on the descriptive statistics, the average value of the Q ratio is above 1, it can be inferred that most of the financial services companies listed on IDX possess good corporate value.

Ulum & Ghozali (2014), in their research, stated that companies can be categorized as top performers when they have MVAIC score above 3.5. With respect to this categorization, the average

Data analysis by using descriptive statistics aims to explain the characteristics of research data in detailed and systematic manners, thus providing accurate calculation results. In this research, descriptive statistics provide time trends with respect to mean, median, standard deviation, maximum value and minimum value of the tested variables. The following Table 2 shows the results of the descriptive statistics analysis for the four consecutive periods (2015 - 2018).

listed financial services companies for 4 periods can be categorized as the top performers, this is based on the average value depicted in the descriptive statistics analysis results, which is 5.5557. Further, this research also discusses in detail the value-added components which constitute the MVAIC, they include capital employed efficiency (CEE), human capital efficiency (HCE), structural capital efficiency (SCE), and relational capital efficiency.

It can be implied that for 4 periods, the minimum value of the DAC is -3.5599, while the maximum value is 0.8634. A positive DAC value indicates a company engaging earnings management by increasing income, which means that profits that have been deferred in the previous year are recognized in the current year, resulting in an increase of DAC value

that aims to save taxes. On the contrary, companies with negative DAC value means that they engage in earnings management by decreasing income. This is because the companies suspend their income and accelerate the recognition of expenses, in accordance with the conservative accounting strategy to reduce the reported income.

#### 4.2 Multicollinearity

The existence of a strong correlation between the independent variables in the statistical models or also known as multicollinearity is not

recommended, because this will affect the accuracy of the estimated parameters. This research employs the Pearson correlation coefficient to identify the presence of multicollinearity. The allowed maximum value of the correlation among independent variables is 0.90. If the value of the calculated correlation is less than 0.90, it can be implied that multicollinearity does not exist among the observed independent variables. The results of the multicollinearity test can be seen in table 4.5. and 4.6 below:

**Table 3**  
**Multicollinearity test for models 1A and 2**

	MVAIC	DAC	MVAIC*DAC	SIZE	LEV	ROE	ROA	ATO
MVAIC	1							
DAC	0.100	1						
MVAIC*DAC	0.003	0.740	1					
SIZE	0.212	0.220	0.085	1				
LEV	0.069	0.052	0.100	-0.064	1			
ROE	0.235	-0.045	-0.062	0.160	-0.136	1		
ROA	0.168	-0.193	-0.194	-0.181	-0.165	0.740	1	
ATO	0.297	-0.163	-0.103	-0.250	0.263	0.323	0.572	1

**Notes:**

MVAIC=modified value-added coefficient of intellectual capital (CEE+HCE+SCE+RCE); DAC=Jones modified model discretionary accrual  $((TAC_{it}/A_{it}-1)-NDA_{it})$ ; MVAIC\*DAC=discretionary accrual moderation; SIZE=firm size (Ln(TA)); LEV=leverage (DEBT/EQUITY); ROE=return on equity (Net Income/Shareholder's Equity); ROA=return on assets (Net Income/TA); ATO=assets turnover ratio (Sales Revenue/TA).

**Table 4**  
**Multicollinearity test for model 1B**

	CEE	HCE	SCE	RCE	SIZE	LEV	ROE	ROA	ATO
CEE	1								
HCE	0.470	1							
SCE	0.015	0.076	1						
RCE	-0.059	-0.0008	-0.397	1					
SIZE	0.224	0.219	0.011	-0.226	1				
LEV	0.453	0.026	0.005	-0.083	-0.064	1			
ROE	0.189	0.211	0.085	0.067	0.160	-0.136	1		
ROA	0.051	0.160	-0.006	0.272	-0.181	-0.165	0.740	1	
ATO	0.459	0.281	-0.142	0.260	-0.250	0.263	0.323	0.572	1

**Notes:**

CEE=capital employed efficiency (VA/CE); HCE=human capital efficiency (VA/HC); SCE=structural capital efficiency (SC/VA); RCE=relational capital efficiency (RC/VA); LEV=leverage (DEBT/EQUITY); ROE=return on equity (Net Income/Shareholder's Equity); ROA=return on assets (Net Income/TA); ATO=assets turnover ratio (Sales Revenue/TA).

Table 4.5 and Table 4.6 reveal that the calculated correlation coefficient between all independent variables is less than 0.90. This means that there is no correlation between independent variables

that can make the regression coefficient interpretations become inaccurate.

#### 4.3 Result of Selection of Regression Models

##### 4.3.1 Chow test

The series of best panel data method selection test starts with a chow test. In this test, if the F probability value is less than the significance value of 0.05 or 5%, then the null hypothesis is rejected and the fixed effect model becomes the best approach for estimating panel data regression. Conversely, if the value is greater than the significance value, the null

hypothesis will be accepted and the best estimation model is the Common Effect Model. Test results for the three regression models, which include research variables (intellectual capital performance, firm value, earnings management, firm size, leverage, return on equity, return on assets, and asset turnover) are shown in Table 5:

**Table 5**  
**Results of the chow test**

<i>Regression Models</i>	<i>Effects Test</i>	<i>Statistics</i>	<i>d.f.</i>	<i>Results</i>
Model 1A	Cross-section F	9.505**	(68,201)	Fixed Effect model
	Cross-section Chi-square	397.115**	68	Fixed Effect model
Model 1B	Cross-section F	10.071**	(68,198)	Fixed Effect model
	Cross-section Chi-square	412.584**	68	Fixed Effect model
Model 2	Cross-section F	9.423**	(68,199)	Fixed Effect model
	Cross-section Chi-square	397.398**	68	Fixed Effect model

Notes: \*\* significance on level of 5%

Based on the results in Table 5, the null hypothesis is rejected. Then the fixed effect model becomes the most appropriate approach to use. Further, it is necessary to test the results of the fixed effect model approach with another approach, which is the random effect model. Thus, the Hausman test is the next test procedure.

#### 4.3.2 Hausman test

Fixed effect models, as a result of the Chow test, must then be tested with a random effect model, to determine the most appropriate model for the

regressions. Hausman test is needed to perform this. If the probability is less than the significance value of 0.05 or 5%, then the null hypothesis is rejected and the Fixed Effect Model is the best approach for estimating panel data regression. However, if the probability is greater than the significance value, the null hypothesis is accepted and the Random Effect Model is the best estimation model to use. The results of the Hausman test can be seen in Table 6.

**Table 6**  
**Results of the hausman test**

<i>Regression Models</i>	<i>Effects Test</i>	<i>Statistics</i>	<i>d.f.</i>	<i>Results</i>
Model 1A	Cross-section random	8.628	6	Random Effect model
Model 1B		13.887	9	Random Effect model
Model 2		10.135	8	Random Effect model

Note: \*\* significance on level of 5%

Based on the results in table 6, none of the three regression models has a significant probability or below 0.05. Thus, the null hypothesis must be accepted. This means that it is necessary to do the following test, Lagrange Multiplier test which will determine the most appropriate panel data regression estimation method between the random

effect model and the common effect model.

#### 4.3.3 Lagrange multiplier test

Lagrange multiplier test is the last selection test of the appropriate panel data regression estimation method. The purpose of this test is to determine the estimation method between the random effect model and the common effect model. If the Chi-square probability is less than the

significance value of 0.05 or 5%, then the null hypothesis is rejected and the Random Effect Model is the best approach for estimating panel data regression. Contradictory, if the Chi-square

probability is greater than the significance value, the null hypothesis is accepted and the Common Effect Model is the best estimation model to use. The test results can be seen in Table 7 as follows:

**Table 7**  
**Results of lagrange multiplier test**

<i>Regression Models</i>	<i>Effects Test</i>	<i>Statistics</i>	<i>Results</i>
Model 1A	Cross-section One-sided	181.669**	Random Effect model
	Period One-sided	0.0977	Random Effect model
	Both	181.767**	Random Effect model
Model 1B	Cross-section One-sided	181.506**	Random Effect model
	Period One-sided	0.1526	Random Effect model
	Both	181.659**	Random Effect model
Model 2	Cross-section One-sided	180.436**	Random Effect model
	Period One-sided	0.0624	Random Effect model
	Both	180.498**	Random Effect model

Note: \*\* significance on level of 5%

Table 7 above shows the results of the Lagrange Multiplier test. Based on these results, the null hypothesis is rejected. Therefore, random effect models become the most appropriate estimation method for all of the three regression models.

#### 4.4 Estimation of the First Regression Models

The random effect regression results relating to the model 1A and 1B are presented in Table 8. In this table, the F value is significant which means the employed regression model is already appropriate.

**Table 8**  
**Result of panel data regression analysis for models 1A and 1B**

<i>Regression Models</i>	<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistics</i>
Model 1A	Constant	3.0328	1.1820
	MVAIC	0.1100	2.9736**
	SIZE	-0.0489	-0.5771
	LEV	-0.0020	-0.0229
	ROE	-2.7023	-4.0435**
	ROA	24.3339	5.3718**
	ATO	-2.8227	-1.9330
Model 1B	Constant	0.7769	0.2990
	CEE	-0.1107	-0.3212
	HCE	0.1129	2.6585**
	SCE	0.1655	1.2971
	RCE	2.2742	4.8265**
	SIZE	0.0228	0.2659
	LEV	0.0353	0.3984
	ROE	-3.1741	-4.7714**
	ROA	28.596	6.3020**
ATO	-3.1292	-2.1126**	
R <sup>2</sup> :	Model 1A= 0.134	Model 1B= 0.204	
F-Statistics:	Model 1B= 6.961**	Model 1B= 7.613**	

Notes:

\*\* significance on level of 5%; Model 1 A :  $TBQ_{it} = \alpha + \beta_1 MVAIC_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 ROE_{it} + \beta_5 ROA_{it} + \beta_6 ATO_{it} + \varepsilon$ ; Model 1B :  $TBQ_{it} = \alpha + \beta_1 CEE_{it} + \beta_2 HCE_{it} + \beta_3 SCE_{it} + \beta_4 RCE_{it} + \beta_5 SIZE_{it} + \beta_6$



LEVit + β7 ROEit + β8 ROAit + β9 ATOit + ε; Model 2 : TBQit = α + β1 MVAICit + β2 DACit + β3 MVAIC\*DACit + β4 SIZEit + β5 LEVit + β6 ROEit + β7 ROAit + β8 ATOit + ε; TBQ = tobin's q (MVE+DEBT/TA); CEE=capital employed efficiency (VA/CE); HCE=human capital efficiency (VA/HC); SCE=structural capital efficiency (SC/VA); RCE=relational capital efficiency (RC/VA); MVAIC=modified value-added coefficient of intellectual capital (CEE+HCE+SCE+RCE); DAC=Jones modified model discretionary accrual ((TACit/Ait-1)-NDAit); MVAIC\*DAC=discretionary accrual moderation; SIZE=firm size (Ln(TA)); LEV=leverage (DEBT/EQUITY); ROE=return on equity (Net Income/Shareholder's Equity); ROA =return on assets (Net Income/TA); ATO=assets turnover ratio (Sales Revenue/TA).

With respect to model 1A which examines the direct relationship of intellectual capital performance as an independent variable and firm value as the dependent variable. While company size, leverage, ROE, ROA, and ATO employed as control variables. The results of the test of the intellectual capital performance effect on firm value produce a t-statistics of 2.9736 with a significance level below 0.05. This indicates that the performance of intellectual capital has a significant positive effect on firm value. Accordingly, H1 was accepted. The model 1B is a continuation of the 1A regression model, it aims to find the most influential intellectual capital performance components on firm value. In this model, the performance of intellectual capital (MVAIC) is translated into CEE, HCE, SCE, and RCE which are its constituent components.

The results of the test of model 1B reveal the t-statistics for each variable,

sequentially -0.3212, 2.6585, 1.2971, and 4.8265. Among these 4 components, HCE and RCE provide a significance level below 0.05. Meanwhile, CEE and SCE do not have any influence on firm value. These results imply that HCE and RCE are the components of MVAIC that positively influence TBQ values. In addition, R<sup>2</sup> shows that the independent variable can explain the dependent variable as much as 13.4% for Model 1A and 20.4% for Model 1B.

#### 4.5 Estimation of the Second Regression Model

The random effect regression results relating to model 2 are presented in Table 9. This regression model explains the moderating effect of earnings management on the relationship between intellectual capital performance and firm value. Consistent with the previous model, the F significance value indicates that the regression model used is appropriate.

**Table 9**  
**Result of panel data regression analysis for model 2**

<i>Regression Model</i>	<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistics</i>
Model 2	Constant	3.1093	1.2095
	MVAIC	0.1106	2.9736**
	DAC	-0.0091	-0.0400
	MVAIC*DAC	-0.0452	-0.6747
	SIZE	-0.0515	-0.6056
	LEV	-0.0052	-0.0577
	ROE	-2.7594	-4.1043**
	ROA	24.6127	5.4132**
	ATO	-2.7844	-1.8905

R<sup>2</sup> = 0.137

F-Statistics= 5.306\*\*

**Notes:**

\*\* significance on level of 5%; Model 1 A : TBQit= α + β1 MVAICit + β2 SIZEit + β3 LEVit + β4 ROEit + β5 ROAit + β6 ATOit + ε; Model 1B : TBQit = α + β1 CEEit + β2 HCEit + β3 SCEit + β4 RCEit + β5 SIZEit + β6 LEVit + β7 ROEit + β8 ROAit + β9 ATOit + ε; Model 2 : TBQit = α + β1 MVAICit + β2 DACit + β3 MVAIC\*DACit + β4 SIZEit + β5 LEVit + β6 ROEit + β7 ROAit + β8 ATOit + ε; TBQ = tobin's q (MVE+DEBT/TA); CEE=capital employed efficiency (VA/CE); HCE=human capital efficiency (VA/HC); SCE=structural capital efficiency (SC/VA); RCE=relational capital efficiency (RC/VA); MVAIC=modified

value-added coefficient of intellectual capital (CEE+HCE+SCE+RCE); DAC=Jones modified model discretionary accrual ((TACit/Ait-1)-NDAit); MVAIC\*DAC=discretionary accrual moderation; SIZE=firm size (Ln(TA)); LEV=leverage (DEBT/EQUITY); ROE=return on equity (Net Income/Shareholder's Equity); ROA=return on assets (Net Income/TA); ATO=assets turnover ratio (Sales Revenue/TA).

Based on Table 9, it appears that the results are consistent with the results of the t-test in Model 1, the direct effect of MVAIC on firm value shows positive and significant results with t statistics 2.9736. Furthermore, the calculated probability value for the earnings management moderating role (MVAIC\*DAC) is greater than 0.05 with t-statistics -0.6747, which states that there is no effect of earnings management as a moderator on the relationship of intellectual capital with firm value, although the direction of the influence is negative. Thus, H2 is accepted.

### *5.1 Building human capital to strengthen intellectual capital*

The regression results in Table 8 show that the performance of intellectual capital has a significant positive effect on firm value. The results of this present research have similarities with the 3 prior studies (Hejazi et al., 2016; Prasetyanto & Chariri, 2013; Smriti & Das, 2018). All three of these results indicate that intellectual capital performance possesses a significant positive effect on firm value. Thus, the existence of intellectual capital increases the value of the company. In the same way, this present research also has relevance to 2 prior studies, in terms of intellectual capital performance proxy (Diyanty et al., 2019; Ulum, 2017). Both of these results prove the measurement of intellectual capital performance by using MVAIC as a result of the modification of the VAIC<sup>TM</sup> formula has a significant positive effect on improving financial performance.

The success of intellectual capital in increasing the firm value, in line with the explanation of agency theory that the business relationship between shareholders and managers through a contract conducted professionally and based on the principles of good corporate governance. Thus, will result in symmetrical information. Cooperation as a form of contract implementation between both parties based on symmetrical information is an ideal condition that is able to create mutual prosperity. Along with the management of intellectual capital as a strength capable of increasing the firm value is a need as well as the common interests of shareholders and managers in operating the company.

The findings also reinforce the previous statement that the management of a company's intellectual capital as a competitive advantage will have a strong influence on increasing the firm value which is reflected in increased share prices (Firer & Williams., 2003; Riahi-Belkaoui, 2003). According to Sawarjuwono and Kadir (2003), intellectual capital is the strength of a company in conducting corporate competition that does not only lie in the ownership of human resources capable of innovating, developing information systems, and managing an efficient corporate organization system.

According to The Chartered Institute of Management Accountant (2009) intellectual capital contains 3 elements consisting of human capital, structural capital, and relational capital, all of which have interdependent relationships as in Figure 3 exhibits below:

**Figure 3**  
**The interrelation of intellectual capital components**

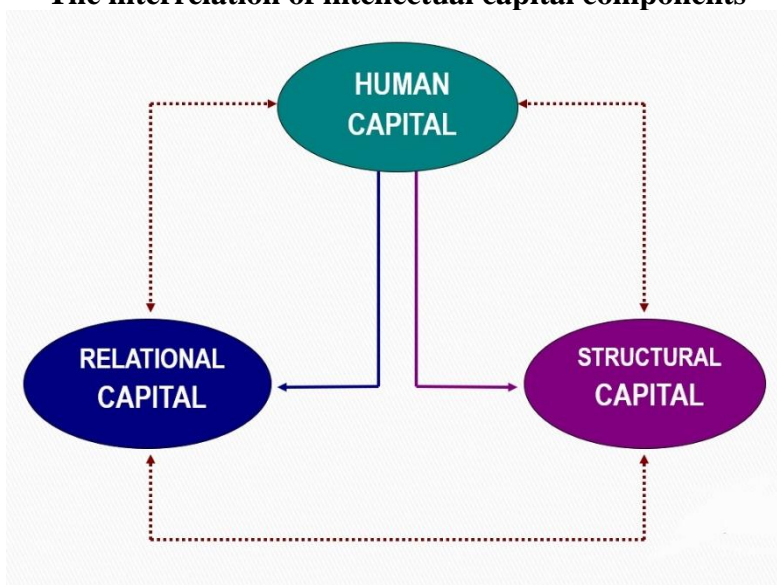


Figure 3 illustrates the 3 components of intellectual capital, each of which can be distinguished but cannot be separated. They support each other in the implementation of their functions. In the context of the functions of each element, we argue about human capital as the component with the most important role and position, because the process of building the function of the customer capital and structural capital is very dependent on the quality of the human capital. For example, the quality of the skills of a company's service toward its customers is determined by the quality of knowledge and skills of the company experts and employees.

The results of the first hypothesis test in this study show that when intellectual capital is able to increase firm value, in more detail it appears that the elements of human capital and the relational capital are giving some high contributions, while the structural capital does not. Then we once argue that a company is deemed to be in the ideal category, regarding the utilization of the power of intellectual capital in increasing firm value, when all of its components of intellectual capital (human capital, structural capital, and relational capital) give equal contributions.

The firm value can be maintained or even increased continuously when there is a balanced strength in form of contributions from 1) human capital as a team of companies' experts that are able to work by producing high-quality products and/or services, 2) structural capital as a result of knowledge and innovative work of the employees in the form of efficient procedures and effective organizational structures, and 3) relational capital as a result of knowledge and work in the form of information and communication systems to increase and maintain external relationships, such as customers and suppliers. In the initial stage, managers need to focus on strengthening the human capital, as a condition for developing structural capital and customer capital. Thus, the maximization of the company's intellectual capital in the financial sector in this research is not yet included in the ideal category. But it is already in the right position and direction of development since the strength of human capital can be functioned to optimally increase the strength of the structural capital.

### *5.2. Earnings management is not the appropriate instrument to increase firm value*

The regression analysis results depicted in Table 9 show that earnings

management has an insignificant negative effect or can be said, it does not have a moderation effect on the positive relationship between intellectual capital and firm value. Then, the results of this research differ from the 3 prior studies, namely (Arsitarini & Fuad, 2018; Sial et al., 2018; Tandry et al., 2014). All three studies provide evidence that earnings management has a significant negative moderation effect on the positive relationship between CSR disclosure and firm value. That is, moderation in earnings management actually gives the effect of reducing the value of CSR disclosure which has the effect of increasing the firm value.

As a form of managers' actions in modifying the financial statements, they deem it necessary to conduct earnings management especially when the realization of the company's profit turns out to be not in accordance with the planned target, thus, it is aimed for the company own benefit (Roychowdhury, 2006). However, the act is carried out without being followed by a comprehensive knowledge of the shareholders. Accordant with the explanation of agency theory which states that information asymmetry will occur, when managers who are more knowledgeable about the company, use their authority to act without the approval of shareholders as the owners of the company. In the context of earnings management practice, conflict between managers as agents and shareholders as principals occurs at the moment that in certain conditions, managers apparently fails to achieve the expected profit target, resulting in their decisions to utilize the

opportunities that exist in the flexibility of accounting system to prepare enhanced reporting through the modification of profit (Eisenhardt., 1989).

According to the results of this research, we argue that earnings management action is needed in a company, as an accounting action that aims positively to maintain the company's profitability in line with the direction of business development strategies. However, it should be understood that the information contained in financial statements resulting from earnings management practice is not in a condition that corresponds to the reality, profitability specifically. Therefore, it is natural that earnings management results are not very impactful as an instrument to increase the firm value, instead, it tends to decrease the firm value. Hence, earnings management may be appropriate to overcome the company's financial problems on a limited scale and at a certain time, but not completely appropriate. Based on our knowledge, the results of research that show earnings management does not have a moderation effect on the effect of intellectual capital in increasing company value is evidence that when earnings management in financial services sector companies that have been done carefully within the boundary of applicable accounting standards, it still does not have any influence or not succeed in increasing the firm value, through the relationships of intellectual capital and firm value.

From a theoretical perspective, the possibility of the moderating effect of earnings management on the relationship between intellectual capital and firm value is visually exhibited in figure 4 below.



**Figure 4**  
**Opportunity of moderating influence of earnings management**

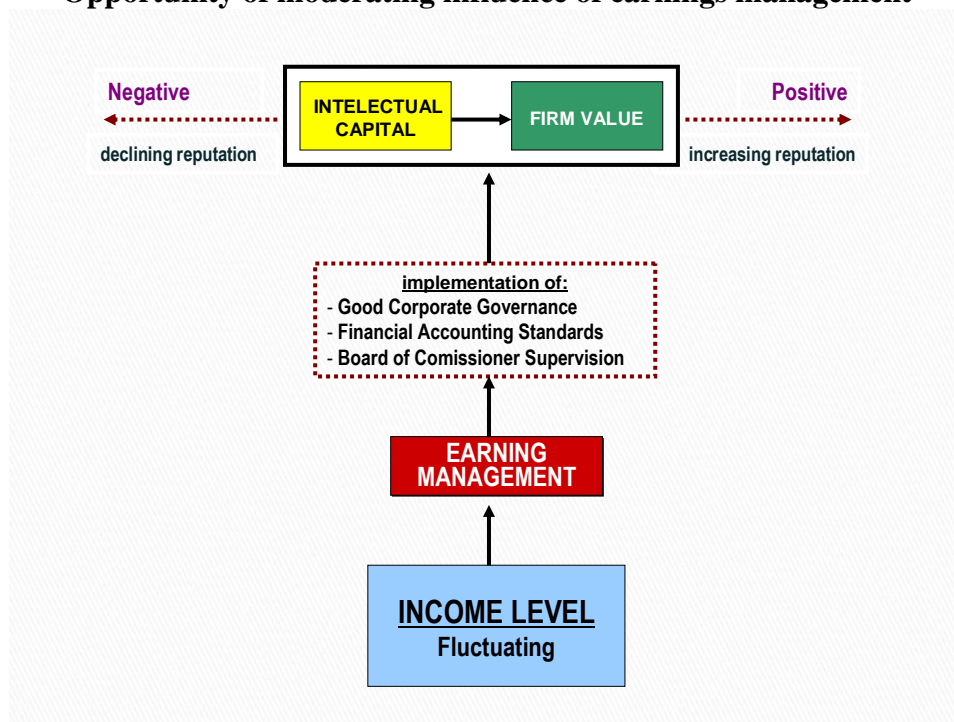


Figure 4 illustrates that earnings management is a practice made possible by the flexibility in accounting which aims to overcome the company's problems, during which the earnings realization is far from what has been targeted. The purpose of managers in conducting the practice is to maintain or enhance the firm value. As an accounting legal action, earnings management must be guided by applicable accounting standards, applied based on the principles of good corporate governance and the results must be opened for review by the board of commissioners. These requirements are fundamental differences between earnings management and earnings manipulation that is categorized as fraud and is clearly illegal (Beneish, 1999).

In research for different types of companies, problems and momentum, the possibility of earnings management can have a positive, negative or no influence on firm value. Similarly, from an ethical perspective, there is also a pro-contra of whether or not earnings management actions are in the best interest of the company. We believe that although

earnings management has a positive purpose meant for the company benefit, it needs to be carried out carefully and selectively, on a limited scale and not continuously. Because, when earnings management successful in increasing the firm value, and managers then conduct it continuously. This can potentially be confined to fraud behavior that harms the company and related stakeholders.

## CONCLUSION AND SUGGESTION

### 6.1 Conclusion

The empirical test results of the first regression model show that intellectual capital provides influence in increasing the firm value of listed financial services companies on the IDX during the period 2015 – 2018. Additionally, the elements of human capital and relational capital give a high contribution in increasing the firm value, compared to structural capital. This condition is considered good, although not ideal yet, because there are only two of the three elements of intellectual capital that affect the firm value, which implies that the intellectual capital performance is still not

in its maximum form. In the second regression model, earnings management has proven unable to moderate the relationship between intellectual capital with firm value. This means that earnings management does not affect the positive influence of intellectual capital in increasing firm value. Thus, earnings management might not be an appropriate approach to support the increase in firm value.

### 6.2. Limitation and suggestion

The limitations found posterior to the analysis and data interpretation in this research are as follows: (1) this research focus merely on two influential variables (intellectual capital and earnings management), in fact, there are other variables that might influence firm value, and (2) this research subject is solely lies on the specific sector of financial services during the period 2015-2018, thus, the research process and results cannot be applied to other business activity sectors.

Based on the results of data analysis formulated in the conclusions and Alipour, M. (2012). The Effect of Intellectual Capital on Firm Performance: an Investigation of Iran Insurance Companies. *Measuring Business Excellence*, 16(1), 53–66.

Anatolievna Molodchik, M., Anatolievna Shakina, E., & Barajas, A. (2014). Metrics for the elements of intellectual capital in an economy driven by knowledge. *Journal of Intellectual Capital*, 15(2), 206–226.

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limitations of the research, the following suggestions are proposed: (1) company managers need to utilize intellectual capital through personal quality selection that is able to build efficient work procedures, and strengthen product marketing networks to improve the performance and value of company, as well as conduct earnings management on a limited and non-continuous basis, (2) investors need to carefully assess the substance of the company's financial statements before investing, (3) the board of commissioners of the Financial Services Authority as a regulator needs to improve regulations for listed companies in order to provide comprehensive and systematic financial data, and lastly (4) the future researcher needs to develop this research by adding more patterns of variables relationships and research objects in other business activity sectors, such as the manufacturing sector.

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