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Intellectual Capital And Firm Performances

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ABSTRACT:*The purpose of this study was to examine the effect of intellectual capital which proxied by VAIC™ by Pulic (1999) and the average growth of intellectual capital (ΔVAIC™) to firm performance. The data used in this study is the first 140 companies listed on the Stock Exchange which is divided into two sectors, manufacturing and non-manufacturing industry which following to research hypothesis. The results showed that the intellectual capital has significant effect to firm performance when firm performance is proxied by the ROA, not by ROE. And the average growth of intellectual capital has a significant effect to firm performance if the company's performance is proxied by ROE and ROA.*

Key words: *Intellectual capital, VAIC™, growth of intellectual capital, firm performances, multiple regression*

I. INTRODUCTION

Today business face increasing challenges and diverse. Competition among businesses is increasing and the number of rivals are demanding more and more business people to always innovate to excel and retain the market. Therefore, the paradigm changes cause changes in accounting reporting paradigm (Budi Hartono, 2001). At first consider the financial statements of the accounting paradigm has the function of stewardship or accountability of managers to the owners. However, the current paradigm of the new accounting shows that the financial statements have decision making functions for the stakeholders to economic decision making.

Changes in the accounting paradigm raises demands for changes to the traditional accounting measurement to the measurement of intellectual capital. Traditional accounting has not been able to identify and measure intangible assets for knowledge-based organizations (Guthrie et al 1999). Limitations of traditional financial reporting accounting in explaining the value of the company shows that the economic resources in the form of physical assets but not the creation of intellectual capital.

Pulic (2000) conducted an indirect measurement of intellectual capital to the company by measuring the efficiency coefficient value added intellectual capital company known as Value Added Intellectual Coefficient - VAIC ™. VAIC main components consist of the company's resources include physical capital, human capital, and structural capital.

Bontis et al. (2000) on the test of intellectual capital consisting of human, structural and customer capital on firm performance indicate that the human and customer capital became a significant factor in implementing the company's business and structural capital has a positive effect on firm performance. Reed (2000) conducted an empirical test the influence of intellectual capital and performance in the banking industry. The results of these studies indicate that intellectual capital into a powerful factor for predicting bank performance. Belkaoui (2003) conducted a study to test the performance of intellectual capital in a multinational company in the United States and the results showed that intellectual capital has a positive effect on firm performance.

Research conducted by Firer and Williams (2003) a study in South Africa to determine the relationship between IC and corporate performance. This study uses VAIC™ whose performance is measured by profitability, productivity and market valuation. The results of this study are the physical resource is the most influential factor in the company in South Africa compared to human and capital resources. From the results of these studies provide indications of the benefits of intellectual capital and the need for an empirical study of intellectual capital on firms go public in Indonesia.

II. LITERATURE REVIEWS & HYPOTHESIS DEVELOPMENT

Intellectual Capital

According to Stewart (1997) intellectual capital is a resource of knowledge available on the company that produces high-value assets and economic benefits in the future for the company. Roos et al (1997) stated that intellectual capital includes all processes and become intangible assets in the balance sheet include trademarks, patents and brands. In 1996 Brooking defines intellectual capital as a combination of intangible assets includes the market, intellectual property, human resources, and infrastructure to function within the company. Meanwhile, Stewart (1997) defines intellectual capital as knowledge that is all intellect, all the information, and experiences that companies use to create wealth.

Intellectual capital according to some researchers consists of three main parts consisting of human capital, structural capital, and physical capital.

Human Capital

Human capital is a source of innovation and improvement in an organization, but it becomes an element that is difficult to measure. Stockley (2003) defines the human capital is the term of human capital is recognition that people in organization and bisiness are an important an essential asset who contribute to development and growth, in a similar way as physical asset such as machines and money. The collective attitude, skill and abilities of people contribute to organization performance and productivity. Any expenditure in training, development, health and support is an investement not just an expense.

Human capital is a very useful source of knowledge, skills, and competencies in a company. Human capital reflects the collective ability to produce the best solutions based on the knowledge possessed by the people who were in the company to add value to the company. Human capital is a combination of knowledge, expertise (skills), ability to innovate in the completion of assignments include corporate values, culture and philosophy (Bontis, 2000).

Structural Capital

Structural capital is an organization's ability to meet the company routines and structures that support employee efforts to produce optimal intellectual performance as well as overall business performance, for example: the company's operational systems, manufacturing processes, organizational culture, management philosophy and all forms of intellectual property are owned company. An individual can have a high intellectual level, but if the organization has poor systems and procedures that intellectual capital can't achieve optimal performance and potential can't be fully utilized.

Structural capital is the infrastructure that supports employees to create optimum performance, including the ability of the organization to reach the market, hardware, software, databases, organizational structure, patent, trademark, and all the ability of organizations to support employee productivity (Bontis, 2000). The concept of the existence of structural capital allows the creation of intellectual capital and be a liaison / processing of human resources into intellectual capital.

Physical Capital

Physical capital or customer capital is the organization's relationship with the people who do business with the organization. Saint-Onge gave the definition of physical capital as depth (penetration), width (coverage), and relatedness (loyalty) of the company. Edvinsson added physical capital is the tendency of customers to keep a company doing business with the company (Stewart, 1997).

Physical capital is often measured or calculated as a source of funding compared to human capital and structural capital. For example, the brand, is an example of physical capital that have an easy method of assessment. This method is done by calculating the customer's premiums would be paid for a particular brand of product compared with other brand products, then by using the cost of capital and the level of remuneration for the capital to calculate the value of the asset (brand reputation) who created the premium.

Physical capital appears in the form of learning, access, and trust. When a company or someone will decide to buy from a company, then the decision is based on the quality of their relationship, price and technical specifications. The better the relationship, the greater the chance purchase plan will happen, and this means that the greater the chances of a purchase plan will happen, and this means that the larger the company the opportunity to learn with and from customers and suppliers. Knowledge shared is the highest form of physical capital. (Sugeng, 2002).

Model Pulic

Pulic in 1998 was developing a method VAIC ™ is designed to present information about value creation efficiency of tangible assets (tangible assets) and intangible assets (intangible assets) of the company. Pulic Model measures a company's ability to create value added (VA). Value added is influenced by the efficiency of human capital (VAHU) and structural capital (STVA). Value Added another related to physical capital (VACA) .

Advantage from Pulic method is the ease in obtaining the data used in the study. The data needed to calculate these ratios are standard financial figures contained in the financial statements. Alternative measurement model of intellectual capital in addition to Pulic limited to measurement of financial and non-financial indicators that are unique to the individual company. The applicability of alternative measurement of intellectual capital has limitations as to the number of samples is large and widely diversified (Firer and Williams, 2003).

Firm Performances

The company's ability to generate profit in operating activities was a major focus in the assessment of the company's achievements. Gain an indicator of the performance of the company's ability to meet obligations to creditors and investors, as well as a part in the value creation process related to the company's future prospects.

Profitability is an important measure for assessing the company that affect an investor to make a decision. On this research we use Return on Assets (ROA) and Return on Equity (ROE) as indicator of the performance of the company's.

Intellectual Capital & Firm Performances

Firer and Williams (2003) test to examine the creation of value through the components of physical capital, human capital and structural capital on profitability, productivity, and market assessment. The results showed that there was no relationship between Intellectual capital with profitability, except capital employed has a positive effect on the market value of the company.

Kin Gan and Zakiah Saleh (2008) tested the performance of corporate intellectual capital and technology intensive company listed on Bursa Malaysia (MESDAQ) using Pulic models. The results showed that the technology intensive companies still depend on the efficiency of physical capital. Pysical capital efficiency is a significant variable related to profitability, while human capital has a positive effect on the productivity of the company. Intellectual capital in the company is not able to explain his relationship with the market valuation (market valuation).

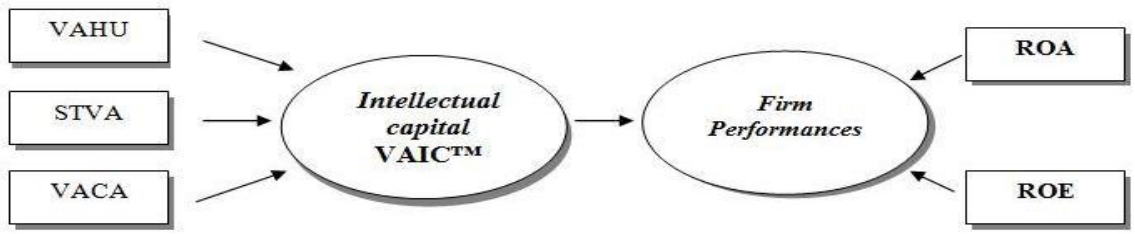
Chen et al (2005) conducted tests using a model of Pulic the company went public in Taiwan. The results showed the hypothesis that intellectual capital has a positive influence on the company's financial performance and market valuation, as well as an indicator of financial performance in the future. Cost of research and development into additional information for structural capital and has a positive influence on the value and profitability of the company.

Because there is between needs and requirement between manufactures company with others company sector, so in this research we are distinguished between manufacturing company with non manufacturing company. Furthermore, the hypothesis in this research is:

H_1 : There is an effect of intellectual capital to firm performances for manufacture companies

H_2 : There is an effect of intellectual capital to firm performances for non- manufacture companies

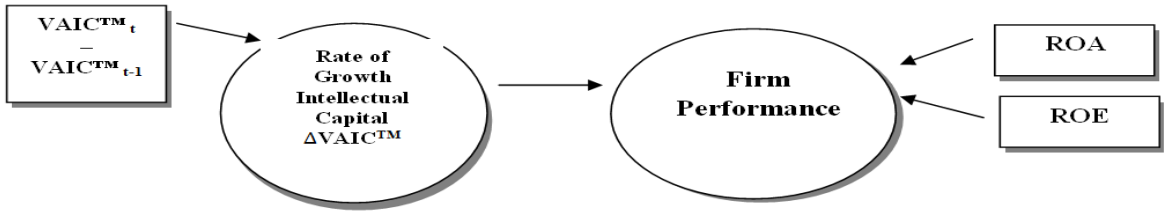
Figure 1



If the company that owns higher of intellectual capital (VAIC ™) , they will tend to have the future performance better, then logically, the average growth of the intellectual capital (rate of growth of intellectual capital - RGIC) will also have a positive relationship with the future financial performance (Tan et al., 2007).

H_3 : There is an effect of average growth of intellectual capital to firm performances

Figure 2



III. METHODS

Method of Data Collection

The data used in this study as the source of the data is in the 2014 Annual Report, the quality of data obtained from the internet reporting company's website and financial data from the Indonesian Capital Market Directory (ICMD) published by the Institute for Economic and Financial Research (ECFIN). Samples that were taken and used in this study were from companies listed on the Indonesia Stock Exchange in 2014. The number of samples in this study were 200 companies. The sample is a purposive sampling to obtain a sample that can represent the specified criteria. There are 140 companies were qualified for further testing.

Independent Variables

Intellectual capital is defined in this study is measured based on the performance of the IC value added created by the physical capital (VACA), human capital (VAHU), and structural capital (STVA). The combination of these three value added is symbolized by the name VAIC ™ is developed by Pulic (1998).

$$VAIC™ = VAHU + STVA + VACA$$

Where:
VAIC™ = coefficient of value added intellectual capital
VAHU = coefficient efficiency of human capital
STVA = coefficient efficiency of structural capital
VACA = coefficient efficiency of physical capital

Besides VAIC™, other variable independent is the average is Intellectual Capital which represents the difference (Δ) between the Intellectual Capital in year t with a value of Intellectual Capital year t-1.

$$\Delta VAIC™ = VAIC™_{t} - VAIC™_{t-1}$$

Where:
ΔVAIC™ = rate of growth coefficient of value added intellectual capital
$VAIC™_{t}$ = coefficient of value added intellectual capital in year t
$VAIC™_{t-1}$ = coefficient of value added intellectual capital in year t-1

Dependent Variables

The dependent variable in this study is the performance of the company which is proxied by return on assets (ROA) and return on equity (ROE).

The formula for obtaining the ROA is: $\mathbf{ROA} = \frac{\text{Net Income}}{\text{Total assets}}$

And the formula for obtaining the ROE is: $\mathbf{ROE} = \frac{\text{Net Income}}{\text{Total equity}}$

Control Variables

Size

In this study, measured by the size variable ln (natural log) total assets in 2014 were obtained from BEI and ICMD site. Total assets illustrates the size of the company. This size is expected to be a positive effect on the company's performance.

Leverage

In this study the variable leverage measured by total debt divided by the book value of total assets of the company in 2014 obtained from BEI and ICMD site. Leverage illustrates the company's level of debt. This leverage is expected to be a positive effect on the company's performance.

Research Model

To test the hypothesis that has been designed, this study uses three main models. The model used is as follows:

1. This model is used to investigate the hypothesis H_1, to test the effect of intellectual capital to firm performance for manufacturing companies. Here is the first research model: $\mathbf{Firm\ Value = \alpha + \beta_1 VAIC^{TM} + \beta_2 Size + \beta_3 Leverage + e}$

2. This model is used to investigate the hypothesis H_2, which is to test the effect of intellectual capital to firm performance for manufacturing companies. Here is a second research model: **Firm Value = α + β_1VAIC^{TM} + β_2Size + β_3Leverage + e**

3. This model is used to investigate the hypothesis H_3, which is to test the effect of the average growth of intellectual capital to firm performance. The following is the third research model: **Firm Value = α + ΔVAIC^{TM} + β_2Size + β_3Leverage + e**

Where:
Firm Value = return on equity dan return on assets as firm performances proxy
VAIC^{TM} = value added intellectual coefficient as intellectual capital proxy
ΔVAIC^{TM} = average growth of intellectual capital, which difference between the intellectual capital in year t with a value of intellectual capital year t-1
Size = ln total assets
Leverage = total debt devided by book value total assets

IV. RESULTS

Descriptive Statistics

From 200 companies drawn reduce to be 140 which qualified as sample in this reasearch. The table shows the descriptive statistics of all variables in this research.

==Insert Table 1 ==

By the tabel shown that VAIC^{TM}, ΔVAIC^{TM} , ROE, ROA, Size and leverage have mean 6.260804, 13.12116, 0.194455, 0.073416, 14.213940 and 69.623843. Meanwhile, standar deviation are 4.937051, 9.288204, 0.284178, 0.044021, 15.988033 and 33.215022.

Hypothesis Testing

Hypothesis testing is using regression linear models to examine the effect of independent and dependend variables of the research model.

==Insert Table 2 ==

From the test results as the table 2 shown that:

- Hypothesis 1 was rejected, if firm performance is measured using ROE for companies that are categorized as manufactured sector. Between intellectual capital and the firms performances there is positive relationship (β1 = 0.204842). This means that intellectual capital affected firm performance but not significant.
- Hypothesis 1 was accepted, if firm performance is measured using ROA for companies that are categorized as manufactured sector. Between intellectual capital and the firms performances there is positive relationship (β1 = 0.256000) with p value = 5%. This means that intellectual capital affected firm performance which is significant.
- Hypothesis 2 was rejected, if firm performance is measured using ROE for companies that are categorized as non manufactured sector. Between intellectual capital and the firms performances there is positive relationship (β1 = 0.335682). This means that intellectual capital affected firm performance but not significant.
- Hypothesis 2 was accepted, if firm performance is measured using ROA for companies that are categorized as manufactured sector. Between intellectual capital and the firms performances there is positive relationship (β1 = 0.379504) with p value = 5%. This means that intellectual capital affected firm performance which is significant.
- Hypothesis 3 was accepted, if firm performance is measured using ROE. Between growth of intellectual capital and firms performances there is positive relationship (β1 = 0.229504) with p value = 5%. This means that growth of intellectual capital affected firm performance which is significant.
- Hypothesis 3 was accepted, if firm performance is measured using ROA. Between growth of intellectual capital and firms performances there is positive relationship (β1 = 5.669178) with p value = 5%. This means that growth of intellectual capital affected firm performance which is significant.

Discussion

Based on the test results as described, the discussion will explore the influence of intellectual capital (VAIC™) and growth of intellectual capital to firm performance. The hypotheses of this study is that intellectual capital (VAIC™) and growth of intellectual capital affect firm performance.

From the test results obtained that intellectual capital significantly affected to firm performance if indicated by ROA, not ROE. So therefore it means that the hypothesis is accepted, that the intellectual capital (VAIC™) has a significant effect to firm performance. The results are consistent with research Chen et.al. (2005), Ulum (2008), Ramadan (2009) and Syed Najibullah (2005) which states that there is a positive significant effect on firm performance proxied by ROA. But inversely proportional to the results Kuryanto (2008) which states that the VAIC and performance of the company is not positively related.

From the test results obtained that growth of intellectual capital significantly affected to firm performance which indicated by ROA and ROE. The study's findings consistent with Tan et al. (2007), which showed a significant influence of the growth of intellectual capital to firm performanceas measured by ROA or ROE. This means that the companies in Indonesia, has a maximum manage and develop theirs intellectual property to win the competitive advantage. Intellectual capital has become an interesting theme to be developed in order to create value for the company. Firms began to focus on the long-term interests, one of which is increasing the financial return. It can be seen from the level of significant of firm performance measures by ROA is 3,950, which means significant at p <0:01 (one-tailed) and if measure by ROE is 5669, which means significant at p <0:01 (one-tailed).

V. CONCLUSION

Based on the results of statistical testing and analysis has been discussed in the previous chapter, it can be concluded as follows:

1. There is a significant relationship between intellectual capital to firm performance when the company's performance was measured by ROA. This proves the first hypothesis and second hypothesis of this study is accepted. That there is significant effect between intellectual capital ($VAIC^{TM}$) to ROA for the company in a category were categorized as manufactured and non-manufactured companies. These results suggest that intellectual capital is one of the important variables that determine the performance of companies in several sectors in Indonesia.
2. There is a significant difference between the average growth of intellectual capital to firm performance when the company's performance was measured by ROA and ROE. This proves the third hypothesis of this study is accepted. That there is significant influence between the average growth of intellectual capital ($\Delta VAIC^{TM}$) on ROA. This means that companies in Indonesia already managed and developed the intellectual capital in order to win the competition advantage. Intellectual capital has become an interesting theme to be developed in order to create value for the company. Firms began to focus on the long-term interests, one of which is increasing the financial return
3. ROE is not considered as a criteria for measurement of firm performance to examine the effect of intellectual capital

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APENDIX

Table 1
Descriptive Statatistics

Variables	Mean	Median	Std Deviasi	Max	Min	Skewness
VACA	0.1898511	0.162565	0.3169425	4.7321266	0.037683	0.218239
VAHU	5.723578	4.239123	3.678509	78.22429	1.012145	4.370599
STVA	0.694616	0.751628	0.629143	0.998233	0.011999	0.426121
VAIC™	6.260804	4.583653	4.937051	79.76785	1.047576	5.126656
ΔVAIC™	13.12116	9.100232	9.288204	159.2575	2.083437	9.840291
ROE	0.194455	0.144144	0.284178	1.471975	0.003326	0.630164
ROA	0.073416	0.039835	0.044021	0.426358	-0.06833	0.080419
SIZE	14.213940	14.240854	15.988033	179.668184	10.03771	0.062640
LEVERAGE	69.623843	68.750991	33.215022	280.04083	26.68947	0.448892

Figure 1
Normal P-Plot *Regression Standardized Residual*
Independent Variabel : VAIC™
Dependent Variabel : ROE

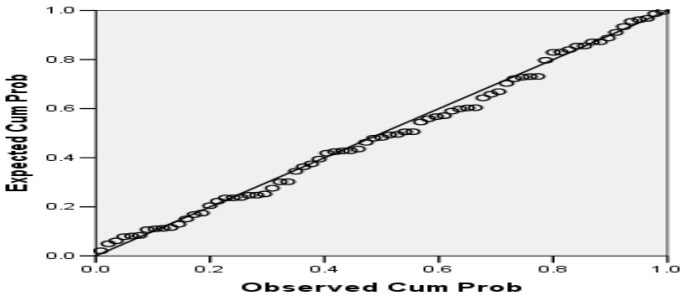

Figure 2
Normal P-Plot *Regression Standardized Residual*
Independent Variabel : VAIC™
Dependent Variabel : ROE

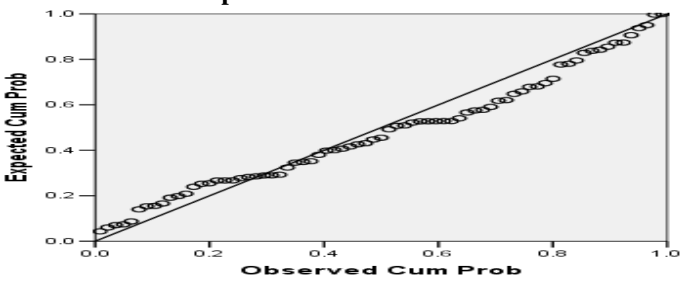

Figure 3
Normal P-Plot *Regression Standardized Residual*
Independent Variabel : ΔVAIC™
Dependent Variabel : ROE

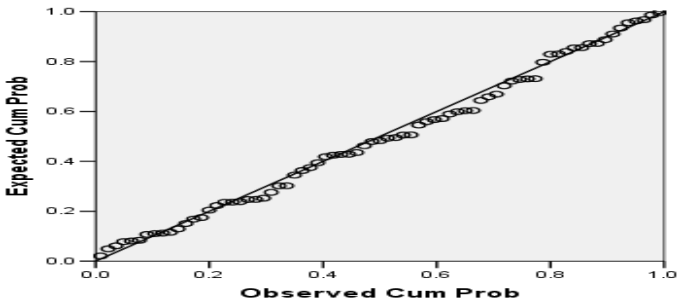

Figure 4
Normal P-Plot *Regression Standardized Residual*
Independent Variabel : ΔVAIC™
Dependent Variabel : ROE

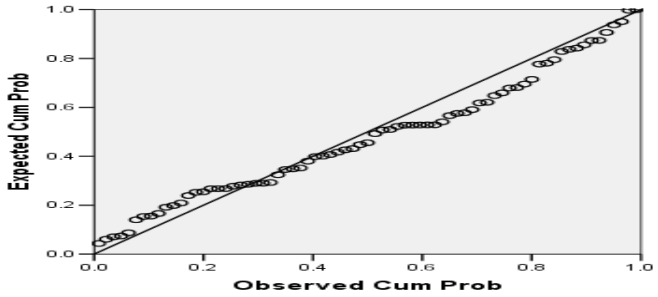

Table 2
Hypothesis Testing

	Hipotesis	Coefficient Estimate	Sig t	Sign	Result
H_1	**(manufactur sectors)**				
	$VAIC^{TM}$ → FV= ROE	0.204842	1.866321	+	Not Significant (H_1 rejected)
	$VAIC^{TM}$ → FV= ROA	0.256000	2.669178	+	Significant (H_1 accepted)
H_2	**(non- manufactur sectors)**				
	$VAIC^{TM}$ → FV = ROE	0.335682	0.463246	+	Not Significant (H_2 rejected)
	$VAIC^{TM}$ → FV = ROA	0.379504	5.224920	+	Significant (H_2 accepted)
H_3	$\Delta VAIC^{TM}$ → FV : ROA	0.229504	5.669178	+	Significant (H_3 accepted)
	$\Delta VAIC^{TM}$ → FV : ROE	5.669178	3.950322	+	Significant (H_3 accepted)

Table 3
OLS Test
Variance Inflation Factor

Variabel	VIF
C	
$VAIC^{TM}$	9,1243
$\Delta VAIC^{TM}$	4,6032
ROE	7,9192
ROA	5,0645

Figure 5
OLS Test
Scatterplot* Data *Residual Error
Independent Variabel : $VAIC^{TM}$
Dependent Variabel : ROE

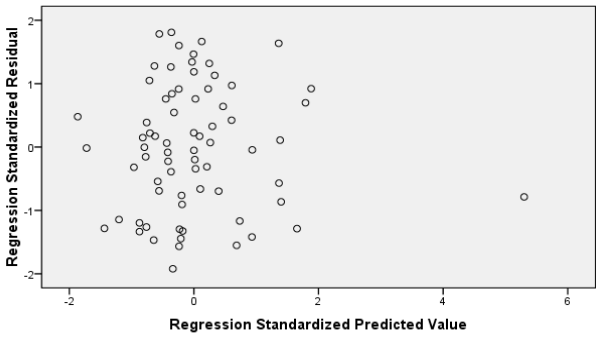

Figure 6
OLS Test
Scatterplot* Data *Residual Error
Independent Variabel : $VAIC^{TM}$
Dependent Variabel : ROA

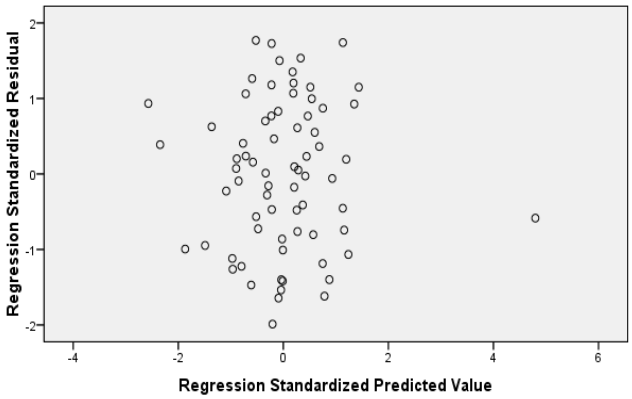

Figure 7
OLS Test
Scatterplot* dari Data *Residual Error
Independent Variabel : ΔVAIC™
Dependent Variabel : ROE

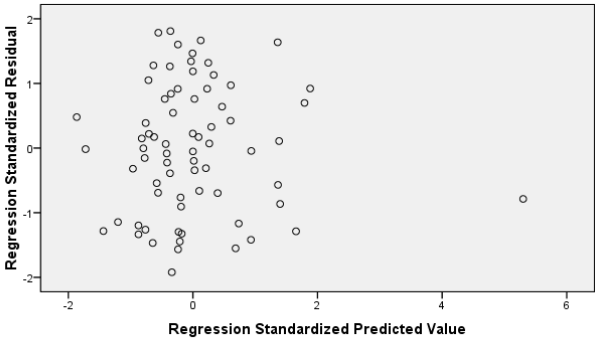

Figure 8
OLS Test
Scatterplot* dari Data *Residual Error
Independent Variabel : ΔVAIC™
Dependent Variabel : ROA