

Intellectual Capital Disclosure Level and Industry-Adjusted Earnings-Price Ratio of Indonesian Public Companies

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Abstract—This study aimed to test whether the intellectual capital disclosure (ICD) level affect the value of equity capital. The ICD level calculation was done using the method of disclosure index. The value of equity capital was calculated using the industry-adjusted price earnings ratio (IndEP ratio). Testing the effect of ICD level on the value of equity capital is done by multiple linear regression analysis using a sample of 97 companies listed in the Indonesia Stock Exchange in 2013 and 2014, with a total sample of 194 observations. The control variable of this work is size, leverage, market to book value and industry. The results of this study indicate that the intellectual capital disclosure level, human capital disclosure level, structural capital disclosure level and relational capital disclosure level had significant negative effect on the cost of equity capital. This study also used four control variables, namely size, leverage, market to book value and industry. Of the four variables, size is not significant positive effect on the cost of equity capital. Leverage and industry had significant negative effect on the cost of equity capital. While, the market to book value had significant negative effect on the cost of equity capital.

Keywords— Intellectual capital, human capital, structural capital, relational capital, disclosure level, value of equity capital, size, leverage.

I. Introduction

The development of business is rapid in the last few decades due to globalization. This has led to widespread business scope from national to international stage, resulting in increased competition in the business world [1]. This situation then raises an awareness that the company must continue to innovate in order to maintain business continuity. Innovation within a company comes from the company's intellectual capital. Therefore, companies are now increasingly aware of the existence of intellectual capital and its important role in a company [2].

Cuozzo et al. [3] stated that intellectual capital is defined as an essential part of the enterprise value creation process. In Indonesia, the phenomenon of intellectual capital flourished after the emergence of Statement of Financial Accounting Standards No. 19 (revised in 2010) on intangible assets, but not explicitly stated as intellectual capital [4]. Statement of Financial Accounting Standards No. 19 has not been regulated on the identification and measurement of intellectual capital, causing many companies in Indonesia that are not aware about revealing intellectual capital [5].

The development of an increasingly complex economy, raises an issue in the field of intellectual capital research. One of them is about intellectual capital disclosure (ICD), which is an important way to report the nature of the intangible value of a company. In relation to the extent of ICD, An et al. [6] stated that that there is a potential benefit to the amount of information disclosed by a company. The potential benefits are to increase the investors who follow them, reduce the investment risk estimate and information asymmetry, so that both can lead to a decrease in the value of equity capital of the company.

Melloni et al. [7] reported that increased disclosure will reduce value of capital. Bellora et al. [8] analyzed ICD among European companies and found that ICD was generally homogeneous among the companies in Europe. Manolopoulou et al. [9] examined ICD of Greek firms and found that ICD was very minimal during the time of crisis. Botosan [10] stated that there are two research streams supporting the negative relationship between disclosure level and value of equity capital. The first research flow suggests that more disclosure may increase stock liquidity, which will result in value of equity capital. While the second research flow suggests that more disclosure may lower the company's risk estimates relative to the expected rate of return by investors. The decline in returns expected by investors is due to the decrease in their uncertainty about the company, and ultimately will reduce the value of equity capital. Wang et al.[11] analyzed the quality ICD of information technology firms in China and

India, and found that Indian firms quality were better in performing the ICD when compared with China's firms. Research conducted by Boujelbene et al.[12] suggested that there is a significant negative relationship between the disclosure of two elements of intellectual capital (human capital and structural capital) with value of equity capital.

This study has analyzed the effect of intellectual capital disclosure level (ICD) and each component which are human capital disclosure level (HC), structural capital disclosure level (SC) and relational capital disclosure level (RC) on the cost of equity capital in intensive technology industry companies and traditional industries listed on the Indonesia Stock Exchange (ISE) between the year of 2013 and 2014. This research also used several control variables, which were size, leverage, market to book value and industry.

II. Methodology

A. Research Approach

The approach used in this research is quantitative approach. Quantitative approach uses secondary data to answer the problem formulation.

B. Research Variables

The following hypothesis were set for this work. H1: Intellectual capital disclosure level has a negative effect on the cost of equity capital. H2: Human capital disclosure level has a negative effect on the cost of equity capital. H3: Structural capital disclosure level has a negative effect on the cost of equity capital. H4: Relational capital disclosure level has a negative effect on the cost of equity capital. Therefore, based on the analysis model and research hypothesis, the research variables can be identified as follow:

1. Dependent variable

The dependent variable of this work is value of equity capital.

2. Independent variable

The independent variable of this work is ICD level, HC disclosure level, SC disclosure level and RC disclosure level.

3. Control variables

The control variables in this research are size, leverage, market to book value and industry.

C. Data Sources

This study uses secondary data. The data in this research is sourced from the data of intensive technology industry and traditional industries in which there are reports on intellectual capital during the period of 2013 and 2014. This financial report is obtained from Indonesia Stock Exchange (ISE).

D. Population and Sample

The population in this research is all intensive technology industry and traditional industries listed in Indonesia Stock Exchange (ISE) period of 2013 and 2014 with purposive sampling method. The sample studied are companies classified into intensive and traditional technology industries listed in ISE between the period of 2013 and 2014. The company consists of various industry sectors namely advertising, printing and media, retail, construction, tourism, and manufacture. Based on data on ISE, the total listed companies in the industry are 226 companies. For this study, the sample consisted of 97 companies with a total of 194 observations .

Elements that were considered in determining the sample of this study are:

1. The company is an intensive and traditional industrial technology company listed on the Indonesia Stock Exchange (ISE) and publishes its full annual report in 2013 and 2014.
2. Disclose intellectual capital information for the 2013 and 2014 in the annual report.
3. Companies whose financial statements are presented in rupiah.
4. Companies that comply with the calculation criteria IndEP ratio.
5. Companies that have positive equity.
6. The company has all the necessary data in this study, companies which in a given year of data are incomplete, can not be incorporated into this research sample.

E. Analysis Technique

The steps taken to analyze the data in this study are as follow:

1. Determine the sample of the population by using purposive sampling method based on the criteria mentioned.
2. Calculating the research variables in each sample company during the study period.
3. Identify symptoms of classical assumptions such as normality test, multicollinearity test, autocorrelation test, heteroscedasticity test.

III. Result and Discussion

A. Description of Research Variables

Based on Table 1, the results indicated that it can be seen that the average value of cost of equity capital is 0.0069159, the standard deviation is 0.03749569, the minimum value is -0.06527, and the maximum value is 0.14179. Thus, this indicated that the company is subject to lower equity costs. The average value of the structural capital disclosure level is 0.4871129, the standard deviation is 0.12636859, the minimum value is 0.22222, and the maximum value is 0.83333. The average value of the relational capital disclosure level is 0.5220909, the standard deviation is 0.13619477, the minimum value is 0.14286, and the maximum value is 0.80952. The average value of the human capital disclosure level is 0.3865979, the standard deviation is 0.14699822, the minimum value is 0.04545, and the maximum value is 0.72727. The average value of the intellectual capital disclosure level is 0.4629036, the standard deviation is 0.11185427, the minimum value is 0.16393, and the maximum value is 0.77049. This indicates that the level of disclosure is relatively low and shows the low level of awareness of companies to use and develop intellectual capital, structural capital, relational capital and corporate human capital.

Based on Table 1, the average value of size is 28.4386689, the standard deviation is 1.49107002, the minimum value is 25.02615, and the maximum value is 33.09498. This indicates that the size in the sample varies greatly. Large size indicates that the total assets of the company are high, while the small size indicates that the total assets of the company are low.

The average Leverage value is 0.4424529, the standard deviation is 0.19244048, the minimum value is 0.06619 and the maximum value is 0.88090. This indicates that there are companies that have low equity, which causes high use of debt.

The average market to book value is 2.8404015, the standard deviation is 3.01394953, the minimum value is 0.07816, and the maximum value is 22.29148. This indicates that the average company in the sample has a higher market value than book value. Companies that have a high market to book value indicates that the chances of company growth in the future is greater.

Table 1. Descriptive Test Results

	N	Minimum	Maximum	Mean	Std. Deviation
Value Of Equity Capital	194	-0.06527	0.14179	0.0069159	0.03749569
Structural Capital Disclosure Level	194	0.22222	0.83333	0.4871129	0.12636859
Relational Capital Disclosure Level	194	0.14286	0.80952	0.5220909	0.13619477
Human Capital Disclosure Level	194	0.04545	0.72727	0.3865979	0.14699822
Intellectual Capital Disclosure Level	194	0.16393	0.77049	0.4629036	0.11185427
Size	194	25.02615	33.09498	28.4386689	1.49107002
Leverage	194	0.06619	0.88090	0.4424529	0.19244048
Market To Book Value	194	0.07816	22.29148	2.8404015	3.01394953
Valid N (listwise)	194				

Based on Table 2, the sample of observation in this research consists of intensive technology industry and traditional industry. Intensive technology industry has a frequency of 74 companies with a percentage of 38.1%, while the traditional industry has a frequency of 120 companies with a percentage of 61.9%. Thus the total observation in this study is 194 companies.

Table 2. Samples By Sector Groups

	Frequency	Percent
Traditional Industry	120	61.9

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Intensive Technology Industry	74	38.1
Total	194	100

B. Normality Test

Normality test aims to test whether in the regression model, the dependent variable and the independent variable has a normal distribution [11]. If this test does not meet the assumption, then the statistical test becomes invalid. The way to test data normality is by Normal P-Plot chart analysis. Normality test is done using Kolmogorov-Smirnov. Data is said to be normally distributed if significance (2-tailed) shows more than 0.05. Here are the results of the Kolmogorov-Smirnov test. Based on Table 3 both obtained value Kolmogorov-Smirnov of 1.257 and 1.189 with a significance level of 0.085 and 0.118. The value of this i significance is more than 0.05. This shows that the data is normally distributed.

Table 3. Kolmogorov-Smirnov Test Results

	Unstandardized Residual	
	Equation 1	Equation 2
Kolmogorov-Smirnov Z	1.257	1.189
Asymp. Sig. (2-tailed)	0.085	0.118

Based on Figure 1 and Figure 2, it is observed that data is distributed across the line. It can be deduced that the P-P plot graph shows the data is normally distributed.

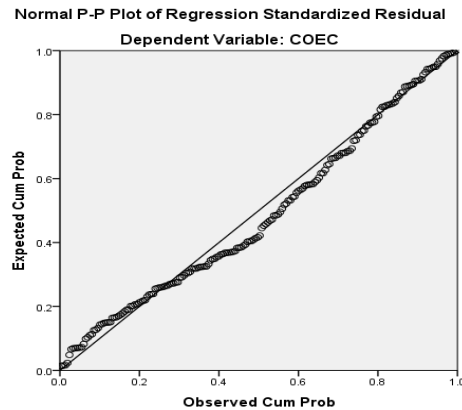


Figure 1. Graph of Normality P-P Plot Equation 1

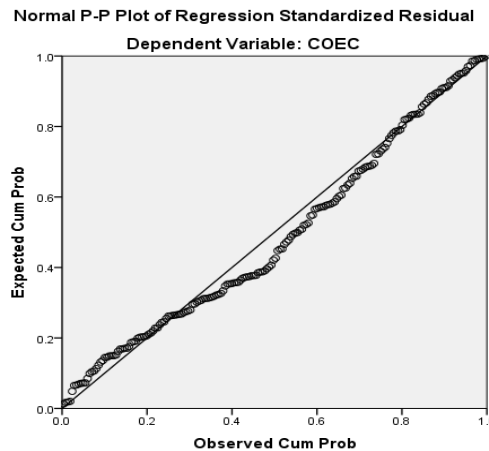


Figure 2. Graph of Normality P-P Plot Equation 2

C. Multicollinearity Test

Table 4 shows the results of multicollinearity tests for equations 1 and 2. All the variables in equation 1 are ICD firm's size (size), leverage (lev), market to book value (MBV) and industry (IND) have tolerance values > 0.10 and VIF < 10. While all the variables in equation 2 are (SC), (RC), (HC), firm's size (SIZE), leverage (LEV), market to book value (MBV) and industry (IND) have tolerance values > 0.10 and VIF < 10. It can be deduced that all the variables in the regression model tested in this study did not exhibit multicollinearity.

Table 4. Multicollinearity Test Results

Variable	Collinearity Statistics				Description
	Equation 1		Equation 2		
	Tolerance	VIF	Tolerance	VIF	
ICD	0.975	1.026	-	-	Free Multicollinearity
SC	-	-	0.642	1.558	Free Multicollinearity
RC	-	-	0.634	1.577	Free Multicollinearity
HC	-	-	0.626	1.598	Free Multicollinearity
SIZE	0.903	1.108	0.903	1.108	Free Multicollinearity
LEVERAGE	0.974	1.026	0.942	1.061	Free Multicollinearity
MBV	0.934	1.070	0.888	1.126	Free Multicollinearity
IND	0.974	1.027	0.944	1.059	Free Multicollinearity

D. Heteroscedasticity Test

Tests of heteroscedasticity symptoms were performed to determine whether there is a relationship between confounding variables and independent variables.

Based on Figure 3 and Figure 4, the scatterplot diagram shows that the points spread, do not accumulate and do not form a distinctive pattern. Hence, it is deduced there is a symptom of heteroscedasticity or there is no relationship between confounding variables with independent variables, so the dependent variable is only explained by independent variables. The results of this test indicate that the regression model is free from symptoms of heteroscedasticity.

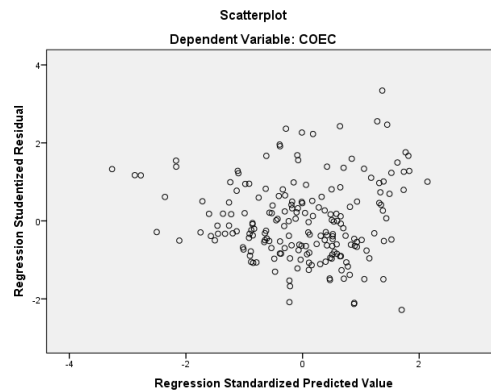


Figure 3. Heteroscedasticity test of equation 1

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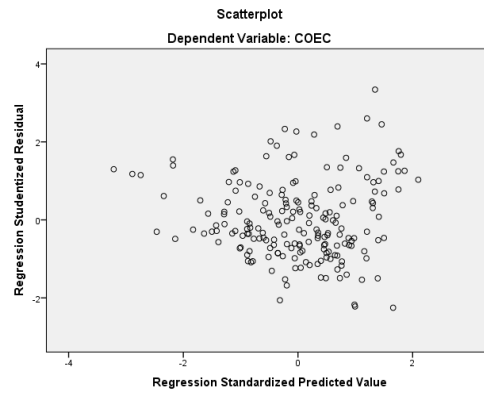


Figure 4. Heteroscedasticity test of equation 3

E. Autocorrelation Test

Autocorrelation test aims to determine whether there is a correlation between confounding variables in a given period with the confounding variable in the previous period. Durbin Watson test was used to evaluate existence if autocorrelation. The test is said to be autocorrelated if it is between $du < DW < 4-du$ [13]. Based on the Durbin-Watson test presented in Table 5, the regression for equation 1 and equation 2 shows the values of 2.148 and 2.141, meaning that the Durbin-Watson value is still in the range of autocorrelation-free regions as they are between $du < DW < 4-du$.

Table 5. Test Durbin - Watson equations 1 and 2

Model	Durbin – Watson	du	4 - du
1	2.148	1.7753	2.2247
2	2.141	1.7965	2.2035

F. Multiple Linear Regression Test

Here are the results of multiple linear regression test for the first model where this regression is testing the influence of independent variables namely ICD level to the dependent variable and the multiple linear regression results is shown in Table 6. Based on Table 6, the results of the regression calculation, can be formulated regression equation as follow:

$$COEC = \beta_0 + \beta_1 ICD + \beta_2 SIZE + \beta_3 LEV + \beta_4 MBV + \beta_5 IND + \varepsilon$$

$$COEC = 0.090 - 0.122 ICD + 0.000 SIZE - 0.003 LEV - 0.004 MBV - 0.006 IND + \varepsilon$$

Where COEC =Cost of Equity Capital. T-test value of ICD level (ICD) is equal to -5.639 with a significance level of 0.000. The significance value is smaller than 0.05 so it can be deduced that the ICD level has a influential down trend value of equity capital (COEC). The result of F test at regression equation is 11.674 with probability equal to 0.000. Since the probability value is less than 0.05 (sig. <0.05), the regression model is suitable to anticipate the value of equity capital. The coefficient of determination (R^2) shows how much all independent variables explain the dependent variable. In Table 6, the R^2 value of 0.237 shows that the ICD level is able to explain the value of equity capital of 0.237 or 23.7% while the rest of 0.763 or 76.3% is explained by other variables that was not analyzed in this work

Table 6. Results of Multiple Regression Analysis of equation 1

	REGRESSION MODEL			
	Coefficient	T	Sig/2	Conclusion
(Constant)	0.090	1.928	0.0275	-
ICD	-0.122	-5.639	0.000	Significant
SIZE	0.000	-0.267	0,395	Not significant
LEVERAGE	-0.003	-0.237	0.4065	Not significant
MBV	-0.004	-4.455	0.000	Significant
IND	-0.006	-1.237	0.1085	Not significant
R square	0.237			
F statistic	11,674			
F Sig	0,000			

Here are the results of multiple linear regression test for the second model as shown in Table 7. Based on the results of the regression calculation, the following regression equation was formulated:

$$COEC = \beta_0 + \beta_1 HC + \beta_2 SC + \beta_3 RC + \beta_4 SIZE + \beta_5 LEV + \beta_6 MBV + \beta_7 IND + \varepsilon$$

$$COEC = 0.092 - 0.037 HC - 0.042 SC - 0.044 RC + 0.000 SIZE - 0.004 LEV - 0.004 MBV - 0.006 IND + \varepsilon$$

T-test value of SC disclosure level is equal to -1.782 with significance level 0.038. This value of significance is smaller than 0.05, so it can be deduced that the disclosure level (SC) has a significant negative effect on value of equity capital (COEC). On the other hand, the value of t-test of the disclosure level (RC) is equal to -1.974 with a significance level of 0.025. This significance value is smaller than 0.05, so it can be deduced that disclosure level (RC) has a significant negative effect on value of equity capital (COEC). In addition, t-test value of disclosure level (HC) variable is equal to -1.816 with a significance level of 0.0355. This value of significance is smaller than 0.05, so it can be deduced that disclosure level (HC) has a significant negative effect on value of equity capital (COEC). The results of the F test on the regression equation are 8.274 with a probability of 0.000. Since the probability value is less than 0.05 (sig < 0.05), the regression model can be used to anticipate the value of equity capital.

The coefficient of determination (R^2) shows how much all independent variables explain the dependent variable. In Table 7, the R^2 value of 0.237 shows that structural capital disclosure level, relational capital disclosure level and human capital disclosure level can explain the cost of equity capital by 0.237 or 23.7% while the remaining 0.763 or 76.3% is explained by other variables that was not analyzed in this work.

Table 7. Results of Multiple Regression Analysis of equation 2

	REGRESSION MODEL			
	Coefficient	t	Sig/2	Conclusion
(Constant)	0.092	1.942	0.027	
SC	-0.042	-1.782	0.038	Significant
RC	-0.044	-1,974	0.025	Significant
HC	-0.037	-1.816	0.0355	Significant
SIZE	0.000	-0.264	0.396	Significant
LEVERAGE	-0.004	-0.280	0.390	Significant
MBV	-0.004	-4.292	0.000	Significant
IND	-0.006	-1.195	0.1165	Significant
R square	0.237			
F statistic	8.274			
F Sig	0.000			

G. Overall Discussion

Based on the results, it is known that the ICD level has a influential down trend value of equity capital. This means that the increase ICD level will then decrease the value of equity capital. Companies that disclose more ICD level information will reduce information asymmetry in the stock market, increase stock liquidity, increase stock demand in the stock market, reduce bid-ask spreads that ultimately increase share prices and lower value of equity capital. In addition, companies that disclose more ICD level information can give investors confidence that the company has advantages over other companies, which can reduce the company's risk estimates relative to the expected returns by investors. The decline in returns expected by investors is due to the decrease in their uncertainty about the company, will reduce the value of equity capital. The results of this study are also consistent with research conducted by Orens et al. [14], Mangena et al. [15] and Boujelbene et al. [12] who found that ICD levels negatively affect value of equity capital.

In addition, results showed that HC disclosure level has a influential down trend value of equity capital. This means that the increase HC disclosure level will decrease the value of equity capital. HC disclosure level can reduce value of equity capital. Value of equity capital decreases as investors' estimate of returns are more appropriate. The outcome of this work is also consistent with the work done by Macagnan et al. [16] who found that HC levels negatively affect value of equity capital.

It is known that RC disclosure level has a significant negative effect on value of equity capital. This means that the increase RC disclosure level will decrease the value of equity capital which is consistent with the finding of Boujelbene et al. [12].

Based on the three components of ICD level, the largest decrease of value of equity capital is influenced by RC disclosure level of 0.044 compared to disclosure level 0.042 and HC disclosure level 0.037. This is because RC is important information that need to be known by investor. As good as any quality and quantity of the company's products, but without a good external network, the product cannot reach the hands of consumers and the company cannot make a profit. Therefore, with this information the investor can assess the company's sales prospects in the future. A good value RC can foster investor confidence in the company's sound financial condition. If the company's financial condition is good, then investors become more interested to invest [15,16]

Finally, result showed that size has a positive effect but is not significant to value of equity capital. On the other hand, leverage and industry had negative effect on the value of equity capital. Furthermore, market to book value is negatively significant on value of equity capital.

IV. Conclusion

Based on the results of data analysis, the following conclusion are drawn. First, ICD Level has a significant negative effect on value of equity capital. This shows ICD Level can reduce information asymmetry, increase stock liquidity, increase stock demand, reduce bid-ask spreads, increase stock prices and lower value of equity capital. Second, HC disclosure level has a significant negative effect on value of equity capital. This shows the superiority of employees in supporting the company's business continuity. Third, SC disclosure level has a significant negative effect on value of equity capital. This indicates that SC is permanent ownership so as to show the actual strength and value of the company. Forth, RC disclosure level has a significant negative effect on value of equity capital. This shows that investors can know the development of company's activity which is seen from good relationship between company and outsider. Fifth, the largest decrease in value of equity capital is influenced by RC disclosure level compared to HC disclosure level and SC disclosure level. This is because RC is important information that need to be known by investor. In addition, size has no significant positive effect on value of equity capital. Finally, leverage and industry negative effect on the value of equity capital, while market to book value had negatively significant effect on value of equity capital.

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