

The effect of intellectual capital disclosure on cost of capital: Evidence from technology intensive firms in Indonesia

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ABSTRACT

There has been an increasing interest in intellectual capital due to the shift from the economical aspect into knowledge and information management aspect. Currently, public firms in Indonesia are not required by accounting standards or law to disclose most of their intellectual capital. However, firms may voluntarily choose to disclose such information. This research aims to examine the level of voluntary intellectual capital disclosure and also the effect of intellectual capital disclosure in firm's annual report on cost of equity and cost of debt. The sample used is technology-intensive industry listed firms year 2010. It shows that the level of intellectual capital disclosure in firm's annual report is relatively still low with an average of 35.77%. It also shows that there is a negative effect between intellectual capital disclosure and cost of equity. However, intellectual capital disclosure does not have significant effect on cost of debt.

ABSTRAK

Ada peningkatan minat modal intelektual karena pergeseran dari aspek ekonomi menuju aspek pengetahuan dan informasi manajemen. Saat ini, perusahaan-perusahaan publik di Indonesia tidak diperlukan oleh standar akuntansi atau hukum untuk mengungkapkan sebagian besar modal intelektual mereka. Namun, perusahaan mungkin secara sukarela memilih untuk mengungkapkan informasi. Oleh sebab itu, penelitian ini bertujuan untuk menguji tingkat pengungkapan modal intelektual sukarela dan juga pengaruh pengungkapan modal intelektual pada laporan tahunan perusahaan terhadap biaya ekuitas dan biaya utang. Sampel yang digunakan adalah perusahaan industri teknologi intensif yang terdaftar pada 2010. Dapat ditemukan bahwa tingkat pengungkapan modal intelektual dalam laporan tahunan perusahaan relatif masih rendah dengan rata-rata 35,77%. Di samping itu ditemukan pula bahwa ada pengaruh negatif dan signifikan antara pengungkapan modal intelektual dan biaya ekuitas. Namun, pengungkapan modal intelektual tidak berpengaruh signifikan terhadap cost of debt.

1. INTRODUCTION

Economic development in Indonesia in the last decade has led to the term “knowledge-based economy” which is economic activity based on knowledge and technology of both information and communications technology. In this knowledge-based economy, there is a structural change from traditional activities, which mainly relies on tangible assets, to new innovation-oriented activities, which rely largely on human capital and knowledge (OECD 2006).

Nowadays, there is an increasingly growing economic climate, in which business began to

realize that the ability to compete not only in the ownership of tangible assets, but rather the ownership of innovation, information systems, organizational management, and organizational resources (Agnes 2008 in Widarjo 2011). Firms as one of the economic doers also follow and develop the technology according to their business lines. This makes the firms no longer rely on their physical assets, but also knowledge, information technology, communication and emphasizes the importance of knowledge assets as a form of intangible assets. One approach used in the assessment and measurement of knowledge assets

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is Intellectual Capital (Guthrie and Petty 2000).

Intellectual capital is a form of intangible assets like employee skill, customer trust, technology, and firm's system that can enhance firm value. In trading industry, intellectual capital can be either customer satisfaction or good relationship with major suppliers. For electronics, telecommunications, computer and multimedia industry innovation, and technology have high values as intellectual capital. While for financial industry, a good relationship with customers and innovative firm's system can be a value of intellectual capital for firm's benefit.

As an intangible asset, the value of intellectual capital can not be measured explicitly so there is alternative for intellectual capital assessment by expanding the disclosure of intellectual capital in firm's annual reports (Sir, Subroto, & Chandrarin 2010). Furthermore, Francis, Khurana, & Pereira (2005) said firm that needs external funding (either debt or equity) will have a higher level of voluntary disclosure and will have advantage of decreasing the cost of debt and cost of equity from the extent of the disclosure. However, another problem arise since intellectual capital disclosure in annual reports is voluntary so the reporting is only recommended (not required) and necessary to provide a fair and relevant presentation according to user needs. This is the reason not all firms issu financial statements and annual reports reveal their intellectual capital information. Therefore, there is still information asymmetry between the user and the manufacturer.

Previous studies such as Sengupta (1998) also examine the association between quality of financial disclosure and cost of debt, concludes that firms with high-quality disclosures will have lower effective interest rate from the issuance of debt. This is consistent with argument that more detailed the disclosure, the perception of "lenders" and "underwriters" of default risk also lower. Mangena, Pike, & Li (2010) specifically examined voluntary disclosure of intellectual capital with cost of equity. Their research concluded that the level of intellectual capital disclosure is negatively related to cost of equity. Firms with higher level of intellectual capital disclosure will have lower cost of equity with percentages of 2.35 to 2.84 points.

This study attempts to extend previous studies. The difference in this present study examines the effect of voluntary disclosure of intellectual capital on both cost of equity and cost of debt. In addition, it only focuses on technology-intensive

industry firms such as banking, insurance, electronics, information technology, and services. Thus, it focuses on these firms because this type of industry is more dependent on technology and has greater intellectual capital assets (Firer and Williams 2003).

2. THEORETICAL FRAMEWORK, AND HYPOTHESIS

One of the firm's goals in annual report preparation is to provide a signal about the firm's condition to related investors and creditors. Signal is given in the form of disclosure of accounting information (Murni 2004). The disclosure of firm's information is divided into mandatory disclosure and voluntary disclosure. Voluntary disclosure is a free choice by firm's management to provide accounting and any other information, apart from which is required, which is considered relevant in decision-making by annual reports' users (Meek et al. 1995).

The purpose of corporate information voluntary disclosure is to reduce estimation risk and eventually cost of capital (Healy and Palepu 2001). Healy, Hutton, & Palepu (1999) also argue that voluntary disclosure can improve stocks' performance and find that higher level of disclosure could help investors in assessing the firm's stock, improve stock liquidity, and help interested parties in analyzing stocks. They find that firms with higher disclosure rankings will have a significant increase in stock price.

One type of voluntary disclosures is intellectual capital. There are several definitions of intellectual capital:

1. Intellectual capital is largely seen as an integral part of the firm's value-creating processes as well as creating and maintaining competitive advantage (OECD 2006).
2. The group of knowledge assets that are attributed to an organization and most significantly contribute to an improved competitive position of this organization by adding value to defined key stakeholders (Marr and Schiuma 2001).
3. The possession of knowledge and experience, professional knowledge and skill, good relationships, and technological capacities, which when applied will give organizations competitive advantage (CIMA 2001).

Intellectual capital classification generally is accepted and mostly used in research such as in human capital, relational capital, and organizational/structural capital. Human capital is the value of the human resource owned by the firm such as innovation, creativity, knowledge, experi-

ence, team capacity, employee flexibility, motivation, satisfaction, learning capacity, loyalty, formal training, education, and professional skills (OECD 2006). While relational capital is the skill of the firm to have good relationship with the market, consumers, suppliers, industry, and government (Mangena et al. 2010).

The examples of relational capital are customer satisfaction, customer loyalty, relationships with suppliers and customers, commercial strength, ability to negotiate, knowledge of market channels, network with industry and government (OECD 2006). Structural capital is the knowledge and skills used by the enterprise to increase productivity, effectiveness and firm innovation which are organizational flexibility, documentation services, the existence of center knowledge, the use of information, technology, organizational learning capacity, effectiveness, and innovation (OECD 2006).

The development of intellectual capital role will increase the awareness of both firm and external parties about importance of this asset. For external parties, they will analyze the information contained in the disclosure of intellectual capital to obtain information about the firm's resources, development, innovation, and other information that needed. On the other hand, firms that aware of the role of intellectual capital for competitive advantage will try to develop the effectiveness and efficiency of its intellectual capital, and may also provide higher quality of intellectual capital disclosures.

There are two types of external financing: equity capital and debt. The firm will be charged as a form of financing returns for financing that they get from external parties. Equity capital providers or usually called the investor will get a return from their investment in the form of dividends or capital gains. Yet, debt providers (creditors) will get return in the form of interest. For firm, the total amount paid for the entire capital financing charges is called cost of capital (cost of equity and cost of debt).

There are several ways to measure cost of equity. First, it is by using the Capital Asset Pricing Model (CAPM). However, Botosan (2006) argues that CAPM-based estimates are not useful for investigating the relationship between disclosure and the cost of equity capital because they do not clearly provide for the role of information. The second is by calculating the internal rate of return that equates the market's expectation of future cash flows to current stock price. Due to unavailability

of analyst forecast in Indonesia to estimate market's expectation of future cash flows, and yet, this approach is rarely used. Third is using Earnings-Price Ratio, suggested by Easton (2004). He argues if estimation of future accounting profit equals with economic profit, then this profit allows for value and expected rate of return is equal to the inverse of the price-earnings ratio that is earnings to price ratio (EPR). The data to compute this last measure is publicly available data.

For investors, if the risk of an investment is high, the minimum rate of return will also be high (high risk, high return). This means that, with high risk, firm must provide high returns to attract investors. With the extent of corporate information disclosure, the uncertainty will be reduced so the estimation risk will also be reduced and result in the lower required rate of return or in other words the cost of equity will decrease (Schuster and O'Connell 2006).

Cost of debt can be determined more easily by observations on the interest rate prevailing in the market. Sengupta (1998) use the yield and interest cost as a measure of the cost of debt. Yield is an effective interest rate that equal to the present value of the principal and interest payments for several amounts that have been paid by the cost lender. However, interest cost is effective interest rate that equal to the present value of the principal and interest on the amount that had received by the firm, reduced by underwriter discounts. Chen & Jian (2007) concludes that there is significant negative association between disclosure level and cost of debt. Firms that disclose more information are more transparent and they will enjoy advantage of lower interest expenses.

Hypotheses Development

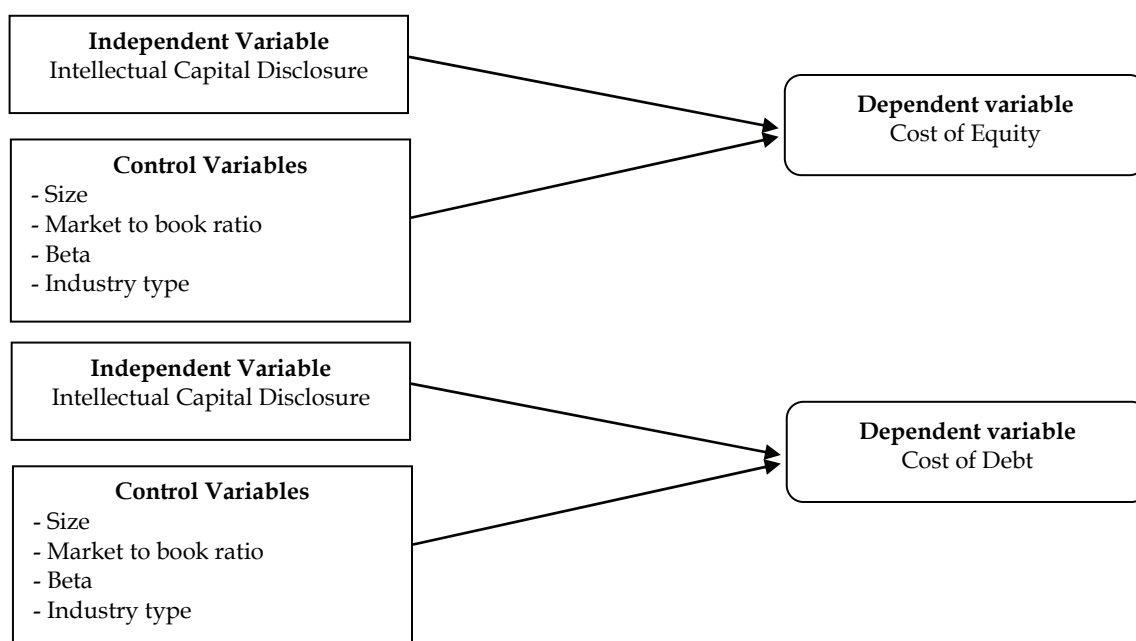
In Figure 1, the theoretical framework of this research is presented. It depicts the relationship between independent and dependent variables examine in this research.

One of the purposes of voluntary disclosure by management is to reduce information risk of investors, and eventually will reduce the cost of equity. Previous studies (such as Mangena et al. 2010) find negative relationship between disclosure and cost of equity. They also find that the disclosure of each component in intellectual capital (human capital, structural capital, relational capital) has negative effect on cost of equity.

H1 : Intellectual Capital Disclosure has negative effect on cost of equity

H1a : Human Capital Disclosure has negative effect

Figure 1
Theoretical Framework



on cost of equity

H1b : Structural Capital Disclosure has negative effect on cost of equity

H1c : Relational Capital Disclosure has negative effect on cost of equity

Sengupta (1998) found that there is negative relationship between disclosure and cost of debt. Intellectual capital (and its component) is part of voluntary disclosure, thus we believe that this type of disclosure is also used by creditors to analyze firm performance when they want to give loan to the firm. Botosan (1997) examined not only the effect of total disclosure on cost of equity, but also the effect of each component of disclosure on cost of equity. Therefore, our research will examine whether total intellectual capital disclosure and also its component (human capital, intellectual capital structural capital, and relational capital) has negative effect on cost of debt.

H2 : Intellectual Capital Disclosure has negative effect on cost of debt

H2a : Human Capital Disclosure has negative effect on cost of debt

H2b : Structural Capital Disclosure has negative effect on cost of debt

H2c : Relational Capital Disclosure has negative effect on cost of debt

3. RESEARCH METHOD

It tests the relationship of disclosure capital (as well as its components: human capital, structural capital, and relational capital) with cost of equity and

cost of debt. The measurement for intellectual capital disclosure is based on Li et al. (2008). They developed disclosure of intellectual capital information into 61 components.

Our research use samples of firms in technology-intensive industries like banking, insurance, telecommunications, advertising and the media, computers, electronics and cables, automotive, pharmaceutical, and chemical industries. Previous studies argue that these industries tend to disclose more comprehensive information of intellectual capital (Mangena et al. 2010; Sir et al. 2010).

Our research use secondary data from annual reports and audited financial statements period 2010 and 2011 for firms in technology-intensive industries listed on the Indonesia Stock Exchange year 2010-2011. The data were obtained from several sources, namely the economic and Business Data Center FE-UI (PDEB FE-UI), data stream, official site BEI www.idx.co.id, and firm's official website.

Criteria for sample selection are as follows (result of sample selection is presented in Table 1):

1. Classified as technology-intensive firms: banking, insurance, telecommunication, media and advertising, computer, electronic and cable, automotive, pharmacy, and chemicals (Mangena et al. 2010; Sir et al. 2010).
2. Published annual report with audited financial statement year 2010 and 2011 (only for model 2).
3. Financial statement presented in Rupiah.
4. Have active shares during 2008-2010. Based on

Table 1
Sample Selection

Description	Models 1 (Cost of Equity)	Models 2 (Cost of Debt)
Firms listed in IDX year 2010 BEI in banking, insurance, telecommunications, media, pharmaceuticals, chemicals, computers, automobiles, cables, and electronics industry.	103	103
(-) Incomplete annual report	7	7
(-) Incomplete financial statement 2011 (for model 2)		7
(-) Financial statement presented in foreign currency	2	2
(-) Incomplete data	15	37
Total Sample	79	50

Surat Edaran (Letter of Notification) Bursa Efek Jakarta (Jakarta Stock Exchange) No. SE-03/BEJ/II-1/1994, criteria for active share that trading is the share that have trading frequency minimum 300 times in a year.

5. For model 2, firms must have interest-bearing debt.

6.

Research Model

It uses following research models for hypotheses testing:

$$COE_{it} = \beta_0 + \beta_1 ICDisc_{it} + \beta_2 SIZE_{it} + \beta_3 MBR_{it} + \beta_4 BETA_{it} + \beta_5 IND_{it} + \varepsilon_{it} \quad (1)$$

Where:

COE = Cost of equity

ICDisc = Intellectual capital disclosure

SIZE = Firm size

BETA = Firm beta

MBR = Market to book ratio

IND = Industry type, 1 for financial industry and 0 for otherwise.

$$COD_{it+1} = \beta_0 + \beta_1 ICDisc_{it} + \beta_2 SIZE_{it} + \beta_3 MBR_{it} + \beta_4 INCOV_{it} + \beta_5 IND_{it} + \varepsilon_{it} \quad (2)$$

Where:

COD = Next year cost of debt

ICDisc = Intellectual capital disclosure

SIZE = Firm size

MBR = Market to book ratio

INCOV = Interest Coverage ratio

IND = Industry type, 1 for financial industry and 0 for otherwise

Variable Definition

Cost of Equity

Dependent variable in our first model is cost of equity. Following Francis et al. (2005), it uses industry-adjusted earnings-price ratio (IndEP ratio) to measure this variable. To compute this variable for firm i, first it computes median of EP ratio or each industry (where at least 5 firms in each industry have positive earnings, excluding firm i). After that, to compute IndEP Ratio, it subtracts the firm i EP

ratio from the median industry EP ratio (Francis et al. 2005).

Cost of Debt

The second model use cost of debt as dependent variable. Cost of debt is calculated from total interest expense divided by average debt (Francis et al. 2005):

$$COD = \frac{\text{InterestExpenseOnDebt}}{\text{AverageInterestBearingDebt}} \quad (3)$$

ICDisc (Intellectual Capital disclosure)

Content analysis is used to compute Intellectual Capital disclosure, based on the information disclosed in annual reports. 61 items of intellectual capital disclosure is adopted based on items developed by Li et al.(2008) and also used by Mangena et al.(2010). These items then divided into Human Capital, Structural Capital, and Relational Capital components. Mandatory items are excluded based on Rule No. X.K.6 issued by the capital market regulator, which leaves total 48 items as voluntary disclosure.

Control Variables

Several control variables are included in the research models. Firm size (SIZE) and market-to-book ratio (MBR) is included in both models. Firm size is a proxy of information availability. Larger firms tend to disclose more information than smaller firms. Investors have better ability to assess firms' risk if they have more information, thus size is expected to have negative effect on firm's cost of equity and cost of debt (Chen and Jian 2007; Espinosa and Trombetta 2007; Mangena et al. 2010). Market to book ratio (MBR) represents firm's growth. High MBR reflects higher firm's growth opportunities. Higher growth is a favorable condition which lower cost of equity and cost of debt because shareholders and creditors are more confidence of firm's ability to provide the required return demanded by shareholders and creditors

Table 2
Intellectual Capital Disclosure

Industry Type	Overall Intellectual Capital (%)	Structural Capital (%)	Human Capital (%)	Relational Capital (%)
Infrastructure (telecommunication)	23.750	9.750	7.750	6.250
Banking and insurance	19.905	8.381	5.643	5.881
Advertising, media & computer	16.429	6.714	4.786	4.929
Pharmaceutical	16.143	6.571	5.143	4.429
Chemical	14.333	6.444	3.667	4.222
Automotive, cable & electronic	13.412	6.471	3.294	3.647

Table 3
Descriptive Statistics - Cost of Equity

	Mean	Median	Std. Deviation	Minimum	Maximum	N
COE	0.0188	0.0000	0.0729	-0.0925	0.2162	79
ICDisc	0.3779	0.3541	0.1352	0.0625	0.6458	79
SIZE (in million rupiah)	13,870.0250	830.0000	9.1520	40.0000	220,838.000	79
MBR	2.1044	1.5800	1.8871	0.2500	11.2500	79
BETA	0.2989	0.3771	0.3932	-0.8870	1.2965	79
IND	0.4936	-	-	0.0000	1.0000	79

COE = cost of equity; ICDsc = intellectual capital disclosure Index; Size = natural logarithm of market capitalization; BETA = systematic risk; MBR = market to book ratio; IND = industry type (financial and non-financial).

(Chen and Jian 2007).

Beta represents systematic risk. Higher beta indicates higher risk, which will increase investors' required return, i.e. increase cost of equity. Beta is expected to have positive effect on cost of equity (Mangena et al. 2010). Yet, for the cost of debt model, interest coverage ratio is included as one of the control variables. This ratio represents firm's earnings ability to cover interest expense. Sengupta (2008) find that this variable has negative effect on cost of debt. Our samples consist of firms from different industries, including financial industry. Due to financial industry is a highly regulated industry compare to other industries, dummy variable of industry type is included to control for this difference.

4. DATA ANALYSIS AND DISCUSSION

Table 2 present the descriptive statistics of intellectual capital disclosure in the samples. Firms in infrastructure industries especially telecommunications like PT Telekomunikasi Indonesia, Indosat and XL Axiata has most highly of total disclosure followed by the firm from banking and insurance industry such as Bank Mandiri, Bank Negara Indonesia, and Panin Insurance with mostly disclosed of intellectual capital component is structural capital which is the knowledge and special skill that each firm has permanently (not lost/change as long as firm still operate).

One characteristic of the telecommunications

and banking industry is very dependent with information technology and broad networking so every firm in this industry must have different technology and having innovation with the network development or new product with various technology used. These firms in telecommunications and banking industry are facing greater competition and they often have to rely on intellectual assets that are difficult for competitors to imitate. These things will become added value for technology-intensive firms and also become competitive advantage by informing the information to interested external parties.

For telecommunication industry, human capital also being disclosed a lot because the firms want to show the advantages of their human resources. However, for the banking industry, relational capital took second place for largest disclosure after structural capital. This is because the financial industry is directly related to citizens so quality of service and customer satisfaction becomes one of the main concerns of this industry and the disclosure of the quality and customers' service development became important to this industry.

Some disclosures that are rarely found seem to be collaborative research, profitable contracts, and relationships with suppliers, attitude and productivity of employees. This can be due to the research collaboration and profitable contracts are still something that firm developed and confidential

Table 4
Descriptive Statistics – Cost of Debt

	Mean	Median	Std. Deviation	Minimum	Maximum	N
COD	0.0840	0.0844	0.0385	0.0185	0.1967	50
ICDsc	0.3975	0.4062	0.1439	0.0625	0.6041	50
SIZE (in million Rupiah)	22,223.0800	2,991.0000	11.8940	40.0000	220,838.000	50
MBR	2.4726	2.1500	1.9903	0.4000	11.2500	50
INCOV	8.7368	5.3785	10.9526	52.0213	0.5277	50
IND	0.3200	-	-	0.0000	1.0000	50

COD = cost of debt; ICDsc = intellectual capital disclosure Index; Size = natural logarithm of total asset; MBR = market to book ratio; Incov = interest coverage ratio; IND = industry type (financial and non-financial).

Table 5
Regression Result – Cost of Equity

$$COE_i = \beta_0 + \beta_1 ICD_{sci} + \beta_2 SIZE_i + \beta_3 MBR_i + \beta_4 BETA_i + \beta_5 IND_i + \epsilon_i$$

Variable	Predicted Sign	Coefficient	t-Statistic	Prob.
ICDisc	-	-0.146945	-1.867989	0.0329**
SIZE	-	-0.001983	-0.405532	0.3431
MBR	-	-0.006500	-1.460789	0.0742*
BETA	+	-0.011105	-0.590341	0.2784
IND	+	0.026139	1.562169	0.0613*
C		0.134272	1.133319	0.1304
F-statistic		3.272561	R-squared	0.183105
Prob (F-statistic)		0.010110	Adjusted R2	0.127154

ICDsc = intellectual capital disclosure Index; Size = market capitalization; MBR = market to book ratio; BETA = systematic risk; IND = industry type (financial and non-financial).

** Significant at 5%

* Significant at 10%

since related to specific technology information that can bring competitive advantage in the future. The relationship with major supplier also is still rarely disclosed by firms in Indonesia because firms do not want one of its products excellences known by competitors.

Lack disclosure of intellectual capital in Indonesia according to Abidin (2000) because firms in Indonesia tend to use conventional based in building the business, so the product produced poor the content of technology. Another thing that can be analyzed from low level of voluntary disclosure (including intellectual capital) in Indonesia according to Juliana (2008) is due to full disclosure and the related information as soon as possible can reduce the anxiety of investors but it can also be used by competitors. As a result, firms are more reluctant to disclose important information because such information can be used by competitors to attack the firm.

Descriptive statistics is presented in Table 3 for the first model (cost of equity) and Table 4 for the second model (cost of debt). The number of samples for the models 1 is 80 samples and for the models 2 is 50 samples.

Based on Table 3, noted that average disclosure of intellectual capital from technology-intensive firms in Indonesia for year 2010 is 37.79% which means firm disclose by average 17 items from 48 items disclosure of intellectual capital information which consists of three categories. The level of disclosure concluded relatively low and showed that the level of firms awareness in use and develop the firm's intellectual capital is still low and could be due to management do not want to reveal too much important information, especially the one they considered as proprietary information.

Statistical results for the dependent variable COE (cost of equity) shows the average COE (using Industry Adjusted EP Ratio) in sample is 1.45%. The negative value of cost of equity in this research does not mean the cost that paid its negative but indicates that firm's cost of equity is lower.

The first control variable is size that represented by market capitalization with an average of 13.870.025 million. Further, the data distribution shows 43 firms in sample has an average market capitalization above IDR 10 billion. Four firms have an average market capitalization above IDR 100

Table 6
Regression Model Result From Disclosure of Intellectual Capital Component

$$COE_i = \beta_0 + \beta_1 SC_i + \beta_2 HC_i + \beta_3 RC_i + \beta_4 SIZE_i + \beta_5 MBR_i + \beta_6 BETA_i + \beta_7 IND_i + \epsilon_i$$

Variable	Predicted Sign	Coefficient	t-Statistic	Prob.
SC	-	-0.263394	-3.960810	0.0001***
HC	-	0.128897	0.068906	0.0327**
RC	-	0.064741	1.149721	0.1275
SIZE	-	0.000536	0.112382	0.4554
MBR	-	-0.011678	-2.424285	0.0089***
BETA	+	-0.005607	-0.358630	0.3604
IND	+	0.019167	1.249811	0.1077
C		0.094737	0.848033	0.1996
F-statistic		4.93327	R-squared	0.32722
Prob (F-statistic)		0.00013	Adjusted R2	0.26089

SC = structural capital; HC = human capital; RC = relational capital; Size = market capitalization; MBR = market to book ratio; BETA = systematic risk; IND = industry type (financial and non financial).

*** Significant at 1%

** Significant at 5%

Table 7
Regression Model Result- Cost of Debt

$$COD_{i,t+1} = \beta_0 + \beta_1 ICD_{disci,t} + \beta_2 SIZE_{i,t} + \beta_3 MBR_{i,t} + \beta_4 INCOV_{i,t} + \beta_5 IND_{i,t} + \epsilon_{i,t}$$

Variable	Predicted Sign	Coefficient	t-Statistic	Prob.
ICDisc	-	-0.0794	-0.8931	0.1883
SIZE	-	-0.0005	-0.1341	0.4469
MBR	-	0.0058	2.0779	0.0218**
INCOV	-	-0.0007	-1.1271	0.1329
IND	+	0.0171	1.3672	0.0892*
F-statistic		2.339602	R-squared	0.210026
Prob (F-statistic)		0.057325	Adjusted R2	0.120256

ICDisc = intellectual capital disclosure Index; Size = natural logarithm of total asset; MBR = market to book ratio; Incov = Interest coverage ratio; IND = industry type (financial and non financial).

** Significant at 5%

* Significant at 10%

trillion, and 32 firms have an average market capitalization between IDR 1-10 trillion. It indicates the various firms' size in the sample.

Table 4 presents descriptive statistics from the variables used in the second research model, namely the cost of debt. The average firm's COD (cost of debt) is 8.40%. This means that in average, firm in the sample had interest rate for debt around 8.40%. The value of standard deviation of COD in the sample is quite varied (3.85%) but lower than COE (7.40%). This is due to the risk of investment in stocks is greater than the investment in debt because the return from debt is fixed. In addition, if the debt is not paid, the lender can take over the firm so the bigger uncertainty of the stock return made the estimation in determination of the COE more various.

Table 5 shows the results of the regression test from the variables used in the first model research,

namely the relationship between disclosures of intellectual capital and the cost of equity.

The Prob (F-statistic) of cost of equity model is 0.010110. These results show the significance value of model is lower than $\alpha = 5\%$ which means reject H_0 . An adjusted R2 value for this first research model was 12.71%. Based on regression results above, the intellectual capital disclosure (ICDisc) variable has significant negative effect on the cost of equity at significant level 5%. Thus, the regression results above support the hypotheses H1a, and also consistent with Mangena et al. (2010) and Kristan and Bontis (2007).

Investors have been using the information of intellectual capital disclosure to estimate rate of return and risk on their stock. Yet the level of disclosure of intellectual capital is relatively low, still the information is useful to investors because shows firm's excellence and still considered as new

Table 8
Regression Model Result From Disclosure of Intellectual Capital Component

$$COD_{i,t+1} = \beta_0 + \beta_1 SC_{i,t} + \beta_2 HC_{i,t} + \beta_3 RC_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 MBR_{i,t} + \beta_6 INCOV_{i,t} + \beta_7 IND_{i,t} + \epsilon_{i,t}$$

Variable	Predicted Sign	Coefficient	t-Statistic	Prob.
SC	-	-0.043744	-0.569663	0.2859
HC	-	0.011471	0.191962	0.4243
RC	-	-0.035036	-0.626874	0.2670
SIZE	-	-0.001097	-0.223776	0.4120
MBR	-	0.005581	1.903934	0.0319**
INCOV	-	-0.000750	-0.991826	0.1635
IND	+	0.018477	1.377474	0.0878*
C		0.133943	1.311362	0.0984
F-statistic		1.647606	R-squared	0.215441
Prob (F-statistic)		0.148753	Adjusted R2	0.084681

SC = structural capital; HC = human capital; RC = relational capital; Size = natural logarithm of market capitalization; MBR = market to book ratio; INCOV = interest coverage ratio; IND = industry type (financial and non-financial)

** Significant at 5%

* Significant at 10%

information in the capital markets. It is proven after the release date of annual report, the average price of the firm's stock has increased and the cost of equity is decline.

The test results in Table 5 shows that size does not significantly associate the cost of equity. This can be due to the characteristics of the investors who focus more on the level of profitability and other financial information in assessing risk and return on investment. The market to book ratio that shows the significant negative effect on cost of equity which indicates that the higher firm's growth opportunities in the future, the firm is assumed more able to give certain return so investors will have lower required rate of return and in turn will lower the cost of equity. Variable beta shows insignificant negative association. Last, the control variable IND (industry type) has positive and significant effect on the cost of equity. It shows that banking and insurance have greater cost of equity due to the risk of financial industry.

Further test is conducted to see which components from intellectual capital (structural capital, human capital, relational capital) that has greater association or even has no association at all to the cost of equity. Table 6 provides the results of the regression test from variables that used in research model with dependent variable is the COE (cost of equity) and independent variable is SC (structural capital), HC (human capital), and RC (relational capital), and the control variable is the size, MBR, Beta, and IND.

Table 6 shows the regression results of each component from intellectual capital to the cost of

equity. Structural capital has a negative and significant effect on the cost of equity. This means structural capital is valued more by investors as consideration in assessing risk as well as expected return since the ownership of structural capital is permanent and show power and real value of firms that cannot removed or changed easily. Relational capital has insignificant effect on cost of equity and human capital has a positive effect on the cost of equity. From this conclusion, only hypothesis H1c (Structural Capital Disclosure in intellectual capital affects negatively to cost of equity) is accepted.

Table 7 below are the results of the regression test from the variables used in the second model which is the effect of intellectual capital disclosure (IC Disclosure) on cost of debt.

Adjusted R² values for second model are 12.02%. These results concluded that for 12.02% variation in variable dependent, i.e. the cost of debt (COD) can be explained by the independent variables, namely ICDisc, SIZE, MBR, INCOV, and IND (industry type). Thus, it remains to be in variation for 87, 98% at cost of debt (COD) is explained by other variables that are not included in this research model.

Based on the regression result, it can be concluded that intellectual capital disclosure has no significant effect on cost of the debt so the test results could not prove the hypotheses. The results of this research is different from the research of Chen and Jian (2007) and Francis et al. (2005) that proves that firms with a level of voluntary disclosure of information more transparent will benefit with a lower interest rate than

firms that are less transparent. This finding may indicate that creditors in Indonesia do not consider disclosure as important factor because they are more concerned with the ability of firms to repay the interest and principal of debt. The annual report provide enough specific information of firm that needed by creditors and investors for decision making, however, not all the information required in the annual reports can be used by the lender. Sudarmadji and Sularto (2007) argues that one of the reasons a voluntary disclosure has no effect to the lender is because lenders pay more attention to the firm's credit eligibility called 5C (character, capability, collateral, condition of economy, and capital) as well as a look at the history of the loan/credit firm to see a risk of loan in firm than the information in the annual report.

There is another explanation for this finding. Ghaffar, Ibrahim, & Zain (2004) suggest that if the proportion of private debt is higher than public debt, it will create close relationship between firm and banks and therefore banks do not require high level of voluntary disclosure. Triningtyas & Siregar (2014) shows that in Indonesia public debt is much lower than public debt.

The first control variables in this model is firm size that shows the insignificant effect on the cost of debt, it can be due to the size of the firm is not major consideration for creditor analysis. Variable market to book ratio has significant positive effect on the cost of debt, this is because the firm was in a stage of growth that require funds for great processes of expansion so they prefer use debt for funding than equity. The high funding in the form of debt will increase the risk of default so that it can increase the cost of the debt for the firm's that has high growing rate.

Based on the test results in Table 7, variable interest coverage ratio has no significant effect on firm's cost of debt. The last control variable is a IND (industry type) that is proven to have a significant positive association on the cost of debt, similar with the result that obtained from the cost of equity model.

The next models want to test which component from three components of intellectual capital (structural capital, human capital, and relational capital) that has greater effect or even has no effect at all on cost of debt as has been proposed in the hypothesis H2b-H2d.

Table 8 is the results of the regression test of the variables used in the model where the dependent variable is COD (cost of debt), the inde-

pendent variable is SC (structural capital), HC (human capital), and RC (relational capital), and the control variable is the size, MBR, INCOV, and IK

Table 8 shows the regression results from each component of intellectual capital towards the cost of debt. Structural capital and relational capital has negative sign but not significant on cost of debt. However, human capital has positive sign but not significant as well, same with the findings on cost of equity. From this results, it can be concluded that hypothesis of H2b, H2d, and H2c rejected and implies that at this time, components of intellectual capital has not become a major consideration yet for the lender in determining the firm's cost of debt.

5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATION

In general, it can be concluded that the level of intellectual capital disclosure in firm's annual report from technology-intensive industry in Indonesia year 2010 is relatively still low with an average of 35.77% disclosure level. As a whole, intellectual capital disclosure is proved to have significant negative effect on the cost of equity. Structural capital disclosure in intellectual capital has a significant negative effect on the cost of equity. However, human capital and relational capital has no effect on cost of equity. Furthermore, intellectual capital disclosure has no significant association with the cost of debt. Disclosure of intellectual capital components (structural capital, human capital and relational capital) also has no significant association to cost of debt.

There are some limitations of this research. Items of the disclosure for scoring the intellectual capital disclosure is adapted from the research by Li et al. (2008) and Mangena et al. (2010). There are other scoring method developed by Sir et al. (2010) or Singh and Zahn (2008). This research has limitations of interest rate data for new debt as used for calculation of the cost of debt because it may be better to calculate cost of debt based on newly issue debt so the value of the cost of debt is not biased by old debts that already have fixed interest rate.

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