



Company's Characteristics and Intellectual Capital Disclosure: Empirical Study at Technology Companies of Singapore

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Abstract. This study aims to determine the effect of company characteristics (company size, leverage, and type of company) on intellectual capital disclosure. The research data is collected from the annual reports of technology companies listed on the Singapore Stock Exchange. The total sample of 57 companies was selected by the purposive sampling method. The analysis technique used multiple regression. The findings of the company size, type of company software (SOFT), hardware (HARD), and technology service (TESV) affect the intellectual capital disclosure. On the other hand, leverage, semiconductors (SEMI), telecommunications (TELE), and electrical equipment manufacturing (ELEC) do not have a significant effect on Intellectual Capital disclosure. Meanwhile, the design manufacturing & distribution technology (DSGN) variable is excluded from the regression equation model.

Keywords: Company characteristics · Intellectual capital disclosure · Technology companies · Singapore

1 Introduction

The change of a paradigm in winning business competition forces companies to innovate and develop their products. Intangible assets play a crucial role as a key to success and trigger value creation for the company. The emergence of companies such as Google, Facebook, Microsoft, Samsung, Apple is proof that intangible assets play an important role in business competition.

Intellectual capital (IC) represents all intangible assets available to a company. More specifically, intellectual capital is the ownership of knowledge, experience, professional knowledge and expertise, good relationships and technological capabilities. When uses optimally in the company's operational activities, it will give a

competitive advantage for the company [1, 5, 19, 21, 28]. The importance of intellectual capital in value creation encourages companies to disclose intellectual capital in their annual reports. [28] stated that the intellectual capital disclosure in the annual report was carried out to meet stakeholders' information needs and improve market performance. Measuring and verifying intellectual capital value in the company's financial statements impacts the company [10]. Unfortunately, the practice of disclosing intellectual capital is still limited by companies [14, 22, 28].

The intellectual capital disclosure in the annual report has attracted a lot of researchers. However, the main factor in disclosing intellectual capital is the characteristics of the company itself. For instance, among ASEAN countries, with various similarities in political, economic conditions and the application of standards and policies (ex. IFRS, corporate governance), Singapore is the ASEAN country with the highest level of intellectual capital disclosure (Global Intellectual Property Center Index report, 2016, 2017, 2018). The Global Intellectual Property Center Index is an index assessment of the results in ASEAN countries' formation. It aims to advance the development of Intellectual Capital in ASEAN through the protection of Intellectual Property.

The size of a big company is often under the spotlight of the stakeholders. With a big company size, the company is considered to have enormous resources, so that the disclosed Intellectual Capital will also be significant. It is similar to the level of leverage and the type of company industry. Therefore, technology companies listed on the Singapore stock exchange are the object of observation. Based on the arguments above, this study examined the effect of company characteristics on Intellectual Capital disclosure.

2 Literature Review and Hypothesis Development

2.1 Company Size

The bigger the size of a company, the more it will become a concern for many parties. It is in line with agency theory which states that the bigger a company, the more complex its stakeholders, consequently the agency costs will increase [17]. Larger companies must receive more intensive supervision from stakeholders, especially concerning how the management manages their intellectual capital, such as; employees, customers, suppliers, and product development [3, 8, 23, 24]. Based on previous research studies, theories and explanations of prior research, the following hypothesis is formulated:

H1: Company size has a positive effect on intellectual capital disclosure.

2.2 Leverage

The leverage for a company gives many advantages, including tax advantages, lower capital costs, and access to repayments. There are several findings related to the relationship between leverage and intellectual capital disclosure [3, 9, 23, 24]. However, agency theory suggests that companies with high debt levels experience more pressure

from debt holders to give more information. [17] in an agency context, it explains that debt holders act as principals. Thus, when there is an increase in leverage, it will be associated with increased agency costs [17]. Based on previous research studies, theories and explanations of previous research, the following hypothesis is formulated:

H2: Leverage has a positive effect on Intellectual Capital disclosure.

2.3 Type of Industry

Resources enable companies to gain and maintain a competitive advantage [6, 26]. Proponents of this statement argued that organizations should look within the company for competitive advantage sources over other competitive environments. Thus, companies with a high level of knowledge must be able to develop their internal potential. Companies of this type, in general, will make more disclosures regarding their intellectual capital.

Intellectual capital disclosure has a goal to reduce the information asymmetry that occurs. By disclosing information about product development, users will be confident about the company's prospects. Technology-based or knowledge-intensive companies tend to disclose their intellectual capital more than companies that mainly depend on tangible assets [24, 28]. The type of industry in this study used the Bloomberg classification. Based on previous research studies, theories and explanations of previous research, the following hypothesis is formulated:

H3: Type of industry has a positive effect on intellectual capital disclosure.

3 Research Method

The object of observation is in annual reports of technology companies listed on the Singapore Stock Exchange for 2016–2018. A technology company is a company with a high level of product development research, rich in knowledge. Therefore, it is suitable as an object of research observation with the topic of Intellectual Capital. Companies in the technology category include Design Manufacturing & Distribution Technology, Semiconductors, Software, Hardware, Technology Service, Media, Telecommunications and Electrical Equipment Manufacturing (according to Bloomberg's industry classification). The sample was selected by the purposive sampling method.

The dependent variable, intellectual capital disclosure (ICD), was measured by content analysis based on the item of disclosure [14]. The independent variables consisted of company size, leverage and type of company. Company size (SIZ) used the proxy Ln Total Asset [9], whereas leverage (LVG) was measured by debt to asset ratio [12]. On the other hand, the variable type of company used a dummy variable in the technology company. It consisted of Design Manufacturing & Distribution Technology (DSGN), Semiconductors (SEMI), Software (SOFT), Hardware (HARD), Technology Service (TESV), Telecommunications (TELE), and Electrical Equipment Manufacturing (ELEC) with Media (MEDI) as the basis [13, 16]. The analysis technique used multiple regression to test the effect of company size, leverage and type of company on intellectual capital disclosure. The formula used is as follows:

$$ICD_{i,t} = \alpha + \beta_1 SIZ_1 + \beta_2 LVG_2 + \beta_{3,10} \text{ Type of Company}_{3,10}$$

Note: ICD is Intellectual Capital disclosure, LVG represents Leverage, and Company Type is a dummy variable, the technology company sub-sector consists of Design Manufacturing & Distribution Technology (DSGN), Semiconductors (SEMI), Software (SOFT), Hardware (HARD), Technology Service (TESV), Telecommunications (TELE) and Electrical Equipment Manufacturing (ELEC) with Media (MEDI) as the basis.

4 Finding and Discussion

4.1 Finding

Descriptive analysis was used to describe the main characteristics of the data in this study. The results of descriptive statistics are shown in Table 1. The results indicate that the index of intellectual capital disclosure is not too high, with an average of 51.6% of items disclosed (15 of 29 total cumulative scores). Meanwhile, the highest disclosure is 83% of items disclosed (24 of 29 the total cumulative score). It means, even though the samples are technology companies, the Intellectual Capital disclosed items are not optimal. The results reveal that the object of observation is not aware of the importance of intellectual capital disclosure.

Additionally, the average company size is around 19.3 from a maximum of 21.89. It explains that the sample companies have a relatively high number of assets. However, the average leverage proves that the sample companies have a relatively low leverage level with varying degrees of variation.

Table 1. Descriptive statistics

Variables	Min	Max	Mean	Standard deviasi	N
ICDC	0.24	0.83	0.516	0.12719	57
SIZE	17.69	21.89	19.3019	1.19764	57
LVRG	0	34.82	1.1808	4.74375	57

The results of the dummy variable descriptive statistics (Table 2) show that all technology subsectors have a mean value that is smaller than the standard deviation. It indicates that the sample companies have a relatively small difference in magnitude between each observation object.

Table 2. Descriptive statistics of dummy variables of technology sub-sector

Variables	Mean	Standard deviasi	N
DSGN	0.2632	0.44426	57
SEMI	0.0526	0.22528	57
SOFT	0.0526	0.22528	57
HARD	0.1053	0.30962	57
TESV	0.2105	0.41131	57
TELE	0.1053	0.30962	57
ELEC	0.2105	0.41131	57

The research test reports that Design Manufacturing & Distribution Technology (DSGN) variable is excluded. The purpose of variable elimination is to get the best model with a small standard error.

Classical assumption test Table 3 states the Kolmogorov-Smirnov value of 0.200 (higher than 5%). In conclusion, the data residuals are normally distributed. The impact of the multicollinearity test asserts that the VIF value of all variables is less than 10. After the transformation, the results obtained that the data passes the autocorrelation test with a dW value of 1.905, and all Glejser test values are above 0.05.

Table 3. Diagnostic test of regression model

Variables	Glejser (Sig)	Collinearity (VIF)
SIZE	0.122	1.087
LVRG	0.063	1.163
SEMI	0.358	1.139
SOFT	0.625	1.137
HARD	0.422	1.271
TESV	0.084	1.560
TELE	0.922	1.278
ELEC	0.382	1.429
Kolmogorov Smirnov Sig. (2 tailed) = 0.200		
Durbin Watson = 1.905		

It can be seen from Table 4 that the F value is 6,237 (sig: 0.000), which shows that there is a significant relationship between intellectual disclosure and its explanatory variables. The results in Table 4 are partly in line with the proposed hypothesis. The findings support H1 that company size has a positive relationship with intellectual capital disclosure. The Sig value of company size is 0.003 ($p < 0.05$), which has an impact. Hypothesis one is accepted. The second hypothesis states the opposite, leverage does not affect disclosure of intellectual capital. The Sig figure of leverage of 0.502 ($p > 0.05$) does not support Hypothesis two is accepted.

Table 4. Regression result of models – intellectual capital disclosure as dependent

Variables	Regression		
	Standardized coeff (Beta)	t	Sig
Constant		-1.066	0.292
SIZE	0.037	3.111	0.003*
LVRG	0.001	0.676	0.502
SEMI	0.066	1.005	0.320
SOFT	0.197	3.147	0.003*
HARD	-0.113	-2.275	0.028*
TESV	0.126	3.579	0.001*
TELE	-0.022	-0.496	0.622
ELEC	0.062	1.649	0.106

F Value = 6.237 (Sig: 0.000) Adjusted
R² = 0.432

Note: *) Significant at 5%

Meanwhile, H3 confirmed that only the software (SOFT), Hardware (HARD) and Technology Service (TESV) sub-sectors were proven to affect the disclosure of intellectual capital ($p < 0.05$). Existing tests report the Sig Software value of 0.003; Hardware 0.028 and Technology Service 0.001 ($p < 0.05$). In summary, the three technology subsectors affect the disclosure of intellectual capital. Two technology subsectors, Software (SOFT) and Hardware (HARD) have a positive effect on disclosure of Intellectual Capital, and Technology Service (TESV) has a negative effect. On the other hand, the Semiconductors (SEMI), Telecommunications (TELE) and Electrical Equipment Manufacturing (ELEC) subsectors cannot be supported by the test results. Semiconductors (SEMI), Telecommunications (TELE) and Electrical Equipment Manufacturing (ELEC) have sig values of 0.320, 0.622 and 0.106 ($p > 0.05$), respectively. The sub-sector of Media (MEDI) has a higher sig value than Semiconductors (SEMI), Telecommunications (TELE) and Electrical Equipment Manufacturing (ELEC).

Overall, the existing variables can explain the disclosure of Intellectual Capital. This statement is supported by a reasonably significant adjusted R² value of 0.432 or 43.2%. Other factors outside the model explain the remaining 56.8%.

4.2 Discussion

Regarding the role of intellectual capital disclosure in reducing information asymmetry, the findings indicate that company size plays a vital role in intellectual capital disclosure. The larger the asset size of a company, the greater the disclosure of its intellectual capital. This finding is supported by [2, 3, 12, 23]. The large asset size makes the company more highlighted by information users. They hope that more

information will be disclosed with their large number of assets, especially value creation. It is incidentally one of the company's strategies to win the business competition.

The results of this study indicate that leverage does not affect intellectual capital disclosure. The conclusions are reported to be in line with the investigations of [3, 9], that leverage does not impact intellectual capital disclosure. The underlying theoretical argument is that companies with higher debt levels will experience pressure from debt holders to publish more information about their ability to pay off their debts. It is explained in agency theory, where debt holders act as principals [17].

The other reason is still within the framework of agency theory. An increase in leverage will help with an increase in agency costs. Agency costs include the cost of bankruptcy risk and the cost of expropriation of assets [17]. Companies with a high degree of leverage tend to focus more on disclosure or information publication required by debt holders. Besides, due to the high level of leverage, companies are already burdened by high agency fees. Accordingly, they tend to ignore intellectual capital disclosure.

The technology sector is divided into eight subsectors, including Design Manufacturing & Distribution Technology (DSGN), Semiconductors (SEMI), Software (SOFT), Hardware (HARD), Technology Service (TESV), Telecommunications (TELE), Electrical Equipment Manufacturing (ELEC), and Media (MEDI). The findings show that several existing technology subsectors do not affect intellectual capital disclosure. Only the software, hardware and technology services sub-sectors affect intellectual capital disclosure.

The Software and Technology Service technology sub-sector has a positive impact on intellectual capital disclosure. These two subsectors are directly related to the development needs of technology users directly. The company continues to conduct research and product development, which sometimes requires a lot of money. Accordingly, by making the Intellectual Capital disclosure, they hope that investors will be sure of the company's prospects. The company strives to impress users of information. The hope is that users of the information will get a clear picture of value formation related to the development of company products in software (in the form of programs). The hardware sub-sector reported different results. The higher the value of hardware, the lower the level of intellectual capital disclosure will be. It is probably due to high competition between companies so that each company tries to hide product information. The company is fully aware that Intellectual Capital is a significant factor in value creation for companies that can win the competition. Therefore they try to minimize disclosure to external parties to the company.

Design Manufacturing & Distribution Technology is excluded from the model. Telecommunications, Electrical Equipment Manufacturing, and Media are technology subsectors that do not impact intellectual capital disclosure. In the context of Resource-Based View, [6] states that sustainable competitive advantage will not be achieved if resources can be distributed to various companies and have high mobility in one industry. The implementation of the strategy requires specific resources.

Based on the homogeneity assumption, this sub-sector of Telecommunications, Electrical Equipment Manufacturing, and Media can be said to be borderless, with one company having almost similar products. It means that the company can carry out the same strategy. Suppose the company has specific resources and its competitors in one

industry also have the same resources. In that case, these resources are very easily owned by other competitors. Then there are no barriers to entering the competition [6]. Consequently, this technology sub-sector does not influence the intellectual capital disclosure.

5 Conclusion

The conclusions obtained from this study are company size, type of software industry, and Technology Service have a positive effect on the intellectual capital disclosure in technology companies listed on the Singapore stock exchange. Meanwhile, hardware has a negative effect.

On the other hand, leverage, Semiconductors, Telecommunications, and Electrical Equipment Manufacturing (ELEC) do not significantly affect intellectual capital disclosure. The Design Manufacturing & Distribution Technology (DSGN) variable is excluded from the regression equation model.

Meanwhile, the limitation of research lies in the current test results, that not all technology companies influence the Intellectual Capital disclosure. It is consistent with the existing arguments. In unpredictable markets such as the technology industry, innovations and new inventions can instantly affect the resources' value. Suggestions for future research can develop observation objects in knowledge-intensive sectors with a stable level of competition, such as companies in the pharmaceutical, health, service and financial sectors.

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