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## **Does Intellectual Capital Add Value to Malaysian Companies?**

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*In knowledge-based economy, intellectual capital (IC) plays an important role compared to the physical assets in achieving a company value and success. The ignorance of IC would result in management putting less attention on IC, and hence IC value added capabilities would not be fully exploited. The study aims to examine the relationship between IC performance (VAIC) and company characteristics with IC disclosure in the annual reports of 68 biggest Malaysian companies listed in Bursa Malaysia based on market capitalization in year 2006. The study follows the classification of IC disclosure (ICD) by Huang et al. (2007), with three broad IC categories in forty-five items. Content analysis was used to collect the IC related information. Other data are gathered from annual reports and datastream. Results show that VAIC is negatively related to IC disclosure. Further classification of VAIC shows that Intellectual Capital Efficiency (ICE) and Human Capital Efficiency (HSE) are negatively related to IC disclosure whilst Structural Capital Efficiency (SCE) is not related to IC disclosure. Negative association suggests that companies reduce intellectual capital disclosure for competitive advantage reason which supports the proprietary cost theory. Company size and leverage are found to be positively related to IC disclosure.*

**Keywords:** Intellectual capital disclosure, VAIC, Capital Employed Efficiency (CEE), Human Capital Efficiency, Structural Capital Efficiency, Intellectual Capital Efficiency, Malaysia.

### **1. Introduction**

In today's economy, knowledge or intellectual capital (IC) plays a more important role as economy's wealth production factors compared to physical assets. More and more businesses make investment in information, internet, software, brands, patents, rights, research and innovations, product breakthroughs, globalisation, global reach, global customer base, worldwide network, rather than physical assets (Seetharaman et al., 2002). The shift is due to the use of information technology whereby businesses give more emphasize on expertise and technical ability, and less on manual labour and physical capital (Brinker, 2000). This leads to IC is becoming a major part of companies' value and the success of business entities is increasingly a function of leveraging the IC in those entities (Keenan & Aggestam, 2001).

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There is a growing demand for more information on IC matters such as human capital, employee, know-how and skills, productive power and information technology amongst users of financial accounting information. However, the investment in the IC matters is still does not appear as positive asset value (Brinker, 2000). Given that IC is increasingly important and becoming a major component of capital, as well as the key tools of the new value creation of wealth, it is important to incorporate IC in the balance sheet. However, relative to tangible assets which are universally recognised, well defined and measured in company accounts, IC assets are difficult to be defined, recognised, managed and measured in the traditional sense (Sudarsanam et al., 2005). Because of these difficulties, most companies fail to recognise IC in their financial statements, even though IC is important to a firm's competitive advantage and contribute to value creation capabilities of a company. By not incorporating IC in the balance sheet, traditional accounting therefore underestimates the true value of firms (Lev & Zarowin, 1999). Various studies also reported that there exist an information gap between the types of information disclosed in annual reports and the types of information demanded in the market (Eccles & Mavrinac, 1995). Bukh (2003) revealed that the information gap is due to lack of communication between company management and the capital market.

The failure to identify, measure, evaluate and report internally the value of relevant IC components leads to decisions in which the value of IC is not incorporated in the balance sheet (Van der Meer-Kooistraand & Zijlstra, 2001). One of the effects of not reporting IC externally would lead to investors having limited information about companies' intangible assets and this might increase the investors' risk perception about these companies. Another effect would lead to the underestimation of future earnings especially for companies with large IC resources. This condition may negatively affect a company in finding new funds which then slow down the growth and erode the competitive advantage of companies.

With the rapid change within the business operation in the new economy, it is important to find out whether firms also adjust their disclosure practices. The objective of the study is to examine the relationship between IC disclosure and the value of IC as measured by the value added intellectual coefficient (VAIC). Due to the importance of IC performance in companies' long term competitive advantage, the study also examines the influence of each component of VAIC in relation to IC disclosure. The results are expected to provide empirical evidence to the policy makers such as capital market regulators and standard setting bodies in monitoring the efficiency of value creation investment and IC reporting practices.

## **2. Literature Review**

### **2.1 IC Reporting Framework**

The Organisation for Economic Co-operation and Development (OECD, 1999) defines IC as the economic value of two categories of intangible assets, i.e. structural capital and human capital. Structural capital consists of proprietary software systems,

distribution networks, supply chains and others. Human capital includes human resources within the organization and also those that are external to the organization, such as customers and suppliers. The term intellectual capital is normally treated as being synonymous with intangible assets. In most cases, IC comprises of three categories: human capital/ employee competence; internal structure/structural capital; and external structure/customer capital/relational structure. IC is expected to create value, achieve and maintain a competitive advantage for the firms (Steward, 2007; Sveiby, 1997).

Various IC frameworks have been developed to capture the IC items in annual reports. IC framework represents the coding schema to classify information and it will assist researchers to identify how IC components are visualized, valued and understood within the organization (Guthrie et al., 2003). The IC framework was initially produced by Brooking (1996) and followed by Sveiby (1997). Their frameworks have then been refined by other IC researchers such as by Guthrie et al. (1999) which contained over thirty (30) attributes across the three IC categories (internal, external and human capital); Guthrie and Petty (2000) modified the IC framework into twenty four (24) attributes (9 internal capital, 9 external capital, and 6 human capital). The framework was shown in Table 1.

Table 1: Intellectual Capital Framework by Guthrie and Petty (2000)

Internal Capital	External Capital	Human Capital
<i>Intellectual Property</i> 1. Patents 2. Copyrights 3. Trademarks  <i>Infrastructure assets</i> 4. Management philosophy 5. Corporate culture 6. Management processes 7. Information systems 8. Networking systems 9. Financial relations	10. Brands 11. Customers 12. Customer loyalty 13. Company names 14. Distribution channels 15. Business collaborations 16. Licensing agreements 17. Favorable contracts 18. Franchising agreements	19. Know-how 20. Education 21. Vocational qualification 22. Work-related knowledge 23. Work-related competences 24. Entrepreneurial spirit (innovativeness, proactive and reactive abilities, changeability)

The framework was adopted by other researchers such as Brennan (2001), April et al. (2003), and Goh and Lim (2004). Bozzolan et al. (2003) also used the modified version of Guthrie and Petty (2000) by the inclusion of FASB (2001) project result. In Bozzolan et al.'s framework, they have twenty two (22) IC items. They excluded management philosophy and financial relations and included research projects as a new attribute to

the internal capital. For external capital, they excluded favorable contracts and company names, but introduced new attributes which are research collaborations and financial contracts. As for the human capital, vocational qualifications and entrepreneurial spirit had been removed but replaced by attribute employees. This framework was later replicated by Vandemaele et al. (2005), in their IC studies in the Netherlands, Sweden and the UK.

Guthrie et al. (2003 & 2004) refined the framework to maintain only eighteen (18) attributes of IC, where, in this framework, for internal structure section, the intellectual property is considered as one attribute; information systems and networking systems are combined as one attribute. A framework by Abeysekara and Guthrie (2004) also classifies IC into three (3) components: internal, external and human capital but these three components are further expanded into 45 IC items; 10 internal capital, 10 external capital; and 25 human capital. Another framework has been introduced by Firer and Williams (2005), where they investigated the level of IC disclosure by using a disclosure index comprising fifty three (53) IC items with five (5) IC categories. The compilation of IC items has been employed from the work of Guthrie and Petty (2000), and Bozzolan et al. (2003). Abdolmohammadi (2005) used modified framework of Guthrie et al. (2004), with ten (10) categories and 58 IC items. A list of 58 components was developed from extensive literatures and the components were then aggregated into ten IC categories.

Besides the frameworks discussed above, Bontis (2003) produced IC-related search items gathered from a panel of researchers from the World Congress on Intellectual Capital. He summarized the list into a collection of thirty eight (38) items. This IC related search terms are later used by Vergauwen and Alem (2005) in their study of IC disclosures in The Netherlands, France and Germany. Citron et al. (2005) investigated the extent to which annual report narrates IC disclosure using a dictionary constructed containing 760 relevant keyword combinations. In their study they also classified IC under three main heading, i.e. human, relational and structural capital. This framework has been adopted by firms pioneering structured reporting such as Skandia and Danish intellectual capital project.

A study in Malaysia by Huang et al. (2007) has made an attempt in grouping IC items based on managers' responses about the availability of IC information in their companies. Factor analysis was used to group the IC items. Huang et al. found that the conventional three priori groupings (human capital, customer capital, and structural capital) have expanded into eight groups. However, further scrutiny shows that the eight groups are actually the same three 'meta-categories' of the three IC components. In this study human capital has been separated into employee capabilities, employee development and retention, and employee behaviour. Structural capital has been split into two, which are development of products ideas and organizational infrastructure. Customer capital has been separated into three sub-groupings, which are market perspectives, data on customer, and customer service and relationship. The final IC framework of Huang et al. (2007) consists of 16 attributes of human capital, 14 attributes of structural capital, and 15 attributes of relational capital.

## **2.2 Intellectual Capital Disclosure**

Some studies on the extent of IC disclosure in Malaysia can be found in Bontis et al. (2000), Goh and Lim (2004), Yau et al. (2009) and Ahmed and Mohd-Ghazali (2012). Bontis et al. (2000) investigated the inter-relationship between customer capital, structural capital and human capital with business performance for the service and non-service industries in Malaysia. The result of the study revealed that regardless of industry type human capital is important: human capital has a greater influence on how a business should be structured in non-service industries compared to service industries. Customer capital had a significant influence over structural capital irrespective of industry. The development of structural capital had a positive relationship with business performance regardless of industry.

Goh and Lim (2004) examined the IC disclosure in the top 20 profit making companies. They reported that among the items that were at the lowest ranking were intellectual capital, organizational learning, expert teams, management quality competencies, innovative, organization learning, human assets, knowledge sharing, human capital, employee competitiveness, creativity, human value, IC, and specialist service. In general, the incidence of IC disclosure is found to be highly qualitative, rather than quantitative. Technology industry has the highest percentage of reporting the IC terms, followed by consumer products, trading/services, plantation, finance, industrial products, properties and others.

Ahmed and Mohd-Ghazali (2012) examined the trend of IC disclosure during the financial crisis period (2008-2010). The results reported an increasing trend of the IC disclosure, especially for the human capital. However, they found significant differences in IC disclosures according to categories whereby external capital was the most disclosed.

In terms of coding system, all the studies above used simple method of scoring: "1" if IC items are disclosed and "0" if not disclosed. Studies by Yau et al. (2009) and Wong and Gardner (2005) differentiate narrative disclosure differently from monetary or other quantitative disclosure. Monetary or other quantitative disclosures were given more weights because the information is more relevant to decision usefulness, more credible and can be verifiable. Yau et al. (2009) classified IC disclosure into four scores: "0" if the IC item was not disclosed; "1" if IC item was disclosed in narrative format; "2" If IC item was disclosed in numerical format; and "3" if IC item was disclosed in monetary format. The study also made comparison between the IC framework of Guthrie and Petty (2000) and Huang et al. (2007). They found that the groupings of IC items in Guthrie and Petty (2000) are to a large extent consistent with Huang et al. (2007) and suggested the issue of cultural differences by adopting either framework may not occur. For comparison purposes with previous studies, Yau et al. (2009) used IC framework by Guthrie and Petty (2000). The results showed that the most disclose IC category was structural capital (57%), followed by relational capital (30%) and human capital (13%). They also noted that majority of the disclosures used narrative format and the format of presenting IC attributes was not consistent.

### **2.3 Intellectual Capital Performance**

IC Performance or Value Added Intellectual Coefficient (VAIC) is a measure for evaluating the efficiency of IC within a company. VAIC is basically an indirect measure of IC value and it provides information about the efficiency of tangible and intangible assets (human capital and structural capital) which are useful to generate value to the company (Pulic, 2000). Higher VAIC value means better management in utilizing companies' value creation potential or managers are efficient in managing companies' resources. VAIC indicates corporate value creation efficiency, i.e. the higher the VAIC coefficient the better management utilizes the company's value creation potential. Firer and Williams (2003) addressed that VAIC has many advantages to be used: easy-to-calculate; standardized and consistent basis of measure; and the data are based on financial statements. The data is considered reliable because the data is audited by professional public accountant. In addition, the nature of data in the form of financial or monetary measure provides a concrete basis for comparing the IC value between companies (Kujansivu & Lonqvist, 2007).

VAIC indicates the total efficiency of value creation from all resources employed in a company. The major components of VAIC consist of physical capital and IC in which IC comprises human capital and structural capital (Chen et al., 2005; Kujansivu & Lonqvist, 2007; Pulic, 2000; Tan et al., 2007; Williams, 2001). The measure for physical and financial capital is known as Capital Employed Efficiency (CEE). CEE is an indicator of how much value added is created by a dollar input of physical capital. Human Capital Efficiency (HCE) indicates how much value added is created by a dollar input of physical capital. Structural Capital Efficiency (SCE) represents the proportion of total value added accounted for by structural capital. The sum of the three measures is the value of VAIC (i.e. CEE + HCE + SCE).

Specific studies on the relationships between VAIC and IC disclosure are limited and can be found in Williams (2001), Goh (2005), and Gan and Saleh (2008). Williams (2001) investigated the relationship between IC performance and the extent of IC disclosure for thirty-one FTSE 100 listed companies in UK from 1996-2000. The IC disclosure was measured using a disclosure index of fifty items. Simple method of scoring was used (1,0). This quantity approach was adopted to avoid issues of subjectivity in given score.. Result indicated that IC performance as measured by VAIC had significant negative relationship with the extent of IC disclosure for two years, 1996 and 1998. The trend of IC disclosure was increasing over the five years. In terms of changes in IC disclosure and IC performance between consecutive years, the results indicated that the number of firms showing increase in IC disclosure was higher than firms showing decrease in IC disclosure. The change between each consecutive year was statistically significant. For VAIC, there was no specific trend shown for the five years. The VAIC value was found high in year 1996 and 1998. The relationship between VAIC and IC disclosure was found negatively significant in years where the VAIC was found high. He advocated that the management's concern of losing competitive advantage to competitors leads them to refrain from disclosing certain IC information to competitors.

A study by Firer and Williams (2003) examined the relationship between the components of VAIC with traditional measures of firm performance (profitability, productivity and market valuation) in South Africa. They found that CEE was positively related to market valuation, and HCE was found negatively related to productivity and market valuation. Physical capital remained the most significant resource of corporate performance.

Goh (2005) was the first study in Malaysia to review performance of commercial banks using the value of intellectual capital performance. Data from the period 2001 to 2003 was used to compare the efficiencies of domestic banks versus foreign banks. Banks were ranked according to their VAIC values. The study showed that the value creation capability of both domestic and foreign banks was the result of efficiently use of human capital. Investment in human capital was shown to yield higher return than investment in physical and structural capital. However, the study also noted that if the redundant resources are not effectively utilized, the banks' efficiency level will deteriorate over time.

Study by Gan and Saleh (2008) examined the association between IC performance and corporate performance of Technology-Incentive Companies for the year 2004 and 2005. Following Chen et al. (2005), they examined VAIC as an aggregate measure and also as separate components (i.e. HCE, SCE, CEE) with corporate performance measured by market to book value, profitability and productivity. They found that VAIC had positively significant relationship with profitability and productivity but not significant with market to book value. For separate components of VAIC, consistently they found CEE and HCE positively significant with all measures of corporate performance. SCE was not significantly related. The results suggest that physical capital efficiency (CEE) and human capital efficiency are important in enhancing the corporate performance (market valuation, profitability, and productivity).

Ting and Lean (2009) examined the relationship between IC performance (VAIC and its components) and financial performance (ROA) of financial institutions in Malaysia for the period 1999 to 2007. The study showed that the value creation capability of financial institutions was largely attributed to HCE. The regression analysis showed that VAIC was positively related to ROA. For VAIC component, the result showed that only HCE and CEE were positively related to ROA. SCE was negatively related but the relationship was not significant. The results somehow demonstrate that increase in value creation efficiency affects firm's profitability.

Mohd-Saleh, Abdul Rahman and Hassan (2009) examined the influence of ownership structure (management, foreign, government and family ownership) on IC performance of companies listed on MESDAQ market in Malaysian Exchange of Securities for a period of three years from 2005 to 2007. Family ownerships were found to have negative influence on IC performance for both VAIC and its components (SCE, CEE and ICE). The result suggests the opportunistic behavior of families to pursuing their objectives at the expense of minority shareholders.

## **2.5 Hypotheses Development**

### **2.5.1 IC Performance and IC Disclosure**

The current study uses legitimacy theory and proprietary cost theory to develop the hypothesis. According to legitimacy theory, the disclosure of IC information can legitimize companies' activities. Companies with substantial IC performance, which was reflected in the higher VAIC coefficient, may also have substantial IC related items and lack of IC disclosure will undermine the reputation of the company (Williams, 2001). Firms with IC related items therefore will increase IC disclosure as to reap all the benefit offered by greater disclosure, such as low cost of capital (Lev, 2001; Williams, 2001), and reduced political costs (White et al., 2007). From previous literatures on voluntary disclosure, companies normally disclose more information than required to legitimize their activities. Williams (2001) argued that firms will provide IC information so that investors and other relevant stakeholders can better assess the firms' future capabilities. Firms could benefit in terms of reduction in the perceived risk associated with the entity and hence would reduce cost of capital when they produce more information to the public. Firms with higher level of IC performance may also have substantial IC value. These firms therefore, have the incentive to disclose more IC information as the lack of such disclosure might undermine their reputation. Companies with high investment in IC will face problem of getting future financing when they fail to disclose the companies' true value. This will affect their future growth. For these companies, the traditional financial statement only show a small part of the total assets of a company if they ignore IC related information. Another impact of poor IC disclosure as proposed by Williams (2001) is that these high IC investment companies might fail to meet the demand of pressure groups such as trade union and consumer organization. The lack in human capital reporting may reveal firms are not investing enough for employees' well-being, such as in education and training. Lev (2001) stressed that the inability of the companies to disclose intangible assets often result in abnormal gains to informed investors, undervaluation of companies and increasing cost of capital, which will distort the investment growth of the companies.

However, the proprietary cost theory may explain the economic consequences of full disclosure, whereby threat of competitors will motivate companies not to disclose information is greater than any benefit offered by disclosure (Healy & Palepu, 2001). Prencipe (2004) argued the reluctance of growth companies to disclose their segment reporting for fear of exposing their business opportunities to their competitors. Williams (2001) found a negative relationship between IC performance and IC disclosure. Firms reduce IC disclosure levels in order to maintain any competitive advantage it has and that action is taken as an effort not to signal competitors about the potential opportunities. Based on the arguments above, the hypotheses are as follows:

**H1:** There is a significant relationship between VAIC and the level of IC disclosure.

**H1a:** There is a significant relationship between ICE and the level of IC disclosure.

**H1b:** There is a significant relationship between HCE and the level of IC disclosure.

**H1c:** There is a significant relationship between SCE and the level of IC disclosure.



## **2.5.2 Company Characteristics and IC Disclosure**

### **Profitability**

Companies having higher profitability may disclose more information in their corporate annual reports as to share the good news and to signal that the management has done a good job to the company. Management of profitable firms will disclose more information in order to obtain personal advantage from the companies; therefore they would rather share good news than bad news. As a result, profitable companies will disclose more information in their corporate annual reports, including information related to IC. Management too, will use this information to strengthen their reputation as well as their position in that successful company.

Oliveira et al. (2006) used signalling theory to suggest that highly profitable firms release more information, especially in relation to good news, to avoid undervaluation of shares. Political cost theory is another reason for highly profitable firms to provide greater disclosure, i.e. in order to show the market the source of their profit and to ease the political cost effect. On the other hand, perspective of proprietary cost theory argues that companies may be reluctant to disclose more information, especially on proprietary related information for fear of competitors. Despite the increased demand on IC information, some argued that such information might put the company in danger of losing competitive advantage (Williams, 2001).

Empirical evidence regarding the relationship between profitability and disclosure is mixed. While Haniffa and Cooke (2002) and Owusu-Ansah (1998) revealed a significant positive relationship, Chen and Jaggi (2000) and Wallace and Naser (1995) found a significant negative relationship between profitability and the extent of mandatory disclosure. The other studies (Barako et. al., 2006; Garcia-Meca et al., 2005; Ku Ismail & Chandler, 2005; Oliveira et al., 2006; Williams, 2001) suggested that the direction of the relationship is not clear as the results of their tests are not significant. In light of the above discussion, the following hypothesis is examined:

**H2:** There is a significant relationship between profitability and the extent of IC disclosure

### **Market-to-Book-Value Ratio (MVBV)**

MVBV is used as a proxy of growth. The difference between MV and BV is caused by the intangibles of the business that are not currently valued in the financial statement. This practice has resulted in hidden value which is not visible in the conventional balance sheet despite huge investments made in this hidden asset. Li et al. (2007) argued that IC disclosure is likely to be greater where the hidden value is higher. The result of their study supports the argument that companies with greater hidden value (IC) will disclose more IC related information as to signal the market their real value drivers, which would lead to more rational decision making by investors.

Legitimacy theory suggests that companies with larger hidden value will make more IC disclosure to inform their stakeholders about such investments. Li et al. (2007) again argued that IC intensive companies are more prone to have a higher hidden value due to the inability of traditional accounting system to reflect human, structural and relational capital. Garcia-Meca et al. (2005) also found a significant positive relationship between IC disclosure through presentation to analysts and this hidden value. In line with this, they concluded that companies with hidden intangible value will disclose a wide range of non financial information to close this information gap between managers and investors. Hence, companies that have IC related information should be interested to disclose them, since these elements will form the basis for the business' future growth and will enhance their corporate reputation and values of the companies.

**H3:** There is a significant relationship between MVBV and the level of IC disclosure.

### **Leverage**

Creditors rely on the information about companies' performance through the annual reports. Thus, companies with high leverage are expected to provide more information, including that related to IC, to satisfy the needs of their creditors, in addition to their shareholders and other stakeholders. Jensen and Meckling (1976) argued that with the presence of bondholders in a firm's capital structure, cost of monitoring will also increase. Jensen and Meckling (1976) stated that higher agency costs were imposed on high leverage firms due to the possibility that wealth may be transferred from debt-holders to shareholders.

Barako et al. (2006) agreed that firms which depend on public funds tend to prepare detailed information to enhance their chance of getting funds. Companies with high leverage are also expected to be monitored more closely by financial institutions and may be required to provide information more frequently than companies with low leverage (Ahmed & Nicholls, 1994). These companies might try to establish or maintain credibility with financial institutions and at the same time signal a positive reputation to the capital providers. This is because transparent companies are considered good by the public. In addition to that, IC information is considered good for future growth of companies, and is therefore likely to be an important indicator of future cash flows for the companies. Thus, companies might provide such information to show that they will have no problem in meeting future obligations. On the other hand, Oliveira et al. (2006), using signalling theory suggested that some low leverage firms have the incentive to signal the market about their financial structure, i.e. their low gearing by implying higher voluntary disclosure. Some argued that such highly geared firms may want to hide the level of risk and therefore disclose less information in their annual reports.

Empirical results from previous studies are mixed. While some studies have found a positive association between leverage and the extent of disclosure (Barako et al., 2006; Ku Ismail & Chandler, 2005; Williams, 2001; White et al., 2007), others did not find a significant relationship between leverage and disclosure (Craswell & Taylor, 1992; Garcia-Meca et al., 2005; Ho & Wong, 2001; Oliveira et al., 2006). However, Eng and

Mak (2003) observed a significant negative relationship between the extent of disclosure and leverage. The following hypothesis is examined:

**H4:** There is a significant relationship between leverage and the level of IC disclosure

### **Firm Size**

Big size companies have more resources and have the capability to prepare IC disclosure than small size companies. Previous studies have revealed a positive relationship between firm size and companies' IC disclosure (Bozzolan et al., 2003; Firer & Williams, 2005; Garcia-Meca et al., 2005; Li et al., 2007; Oliveira et al., 2006; White et al., 2007). The hypothesis is as follows:

**H5:** There is a positive relationship between firm size and the level of IC disclosure.

## **3. Methodology and Model**

### **3.1 Sample and data collection**

Sample of the study is 68 companies from the 100 largest Malaysian companies listed in Bursa Malaysia based on the market capitalization in year 2006. Voluntary IC disclosure was expected to increase following the introduction of FRS 138 Intangible Assets for the reporting periods beginning 1 January 2006 and then became effective for the reporting periods beginning 1 January 2012. The largest companies are selected because these companies are the most likely to have IC related information in their financial statements and that they should have the financial resources to enable a move in the direction of IC disclosure (Abdolmohammadi, 2005; Wong & Gardner, 2005). Data for the IC disclosure were gathered from the annual reports of the companies. Content analysis was used to measure the level of IC reporting. Content analysis is a "research technique for making replicable and valid inferences from data according to their context" (Krippendorff, 1980, p.21). Content analysis of annual reports has been carried out in accounting and IC studies (Abdolmohammadi, 2005; Goh & Lim, 2004; Guthrie et al., 2006; Vandemale et al., 2005), and in the corporate social and environmental reporting of accounting research (Gray et al., 1995b; Guthrie & Parker, 1990). Content analysis is a useful technique in extracting information, which is not explicitly presented in a quantified and structured format, but is implicit in the information (April et al., 2003). The analysis involves reading the annual reports of each company and coding the information contained therein, in accordance with a selected framework of IC indicators/attributes (Guthrie et al., 2006; Guthrie & Petty, 2000). Content analysis requires texts (or contents) of annual reports, qualitative and quantitative information are coded into pre-defined categories (IC categories) in order to derive patterns in the presentation and reporting of information (Weber, 1985).

For the disclosure index of IC disclosure, the study adopts the classification framework proposed by Huang et al. (2007). The framework is chosen because it is an evidence-based framework, based on empirical confirmation in identification and classification of IC components as well as IC items in Malaysian environment. The framework is more

represented as it already takes into account all related cultural and other cross-country differences (Guthrie et al., 1999; 2006). In addition, the use of this IC framework would confirm the findings in Williams (2001) using IC framework by Guthrie and Petty (2001).

To avoid subjectivity of content analysis involved in using simple scoring method, the current study adapts the decision rules by Wong and Gardner (2005). The decision rules are that the coding is based on the meaning. The content analysis in this study is based on paragraphs. Different weight was given for IC disclosure whereby more weight is given to quantitative/monetary format. If a paragraph has IC item score "1" is given, "0" otherwise. The coding system for the type of IC disclosure is as follows: the score "1" was given for disclosure in narrative format; score "2" was given for disclosure in quantitative or monetary format.

The model of this study is as follows:

$$ICD = \alpha + \beta_1 VAIC + \beta_2 PROFIT + \beta_3 LEV + \beta_4 MVBV + \beta_5 \ln SIZE + \varepsilon$$

Where:

ICD	Intellectual capital disclosure
VAIC	Value Added Intellectual Capital
PROFIT	Profitability
LEV	Leverage
LnMVBV	Logarithm of Market value to book value
LnSIZE	Logarithm of size

Following Chen et al. (2005) and Gan and Saleh (2008), instead of using aggregate measure of IC performance (VAIC), the current study examines the influence of three components of VAIC in the model. This is based on the argument that investors may place different values for the three components.

### **3.2 Measurement of Variables**

The operational definitions of variables are reported in Table 2.

**Table 2: Measurement of variables**

Variable	Operational definitions	Sources
<p>Intellectual capital disclosure <b>(ICD)</b></p>	<p>ICD is a total of IC disclosure from human capital, structural capital and capital employed, <math>ICD = HC + SC + CE</math></p> <p>Human capital (HC): the sum of the human capital disclosure;</p> <p>Structural capital (SC): the sum of structural capital disclosure</p> <p>Relational capital (RC) / external capital: the value of an organization's relationships with the people whom it does business with</p>	<p>Huang et al. (2007)</p>
<p>Value Added Intellectual Coefficient <b>(VAIC)</b></p>	<p>VAIC represents a measure for business efficiency or an indicator showing abilities of a company to create value.</p> <p><math>VAIC = HCE + SCE + CEE</math>;  <math>VAIC = ICE + CEE</math>  <math>ICE = HCE + SCE</math></p> <p><math>VA = P+C+D+A</math>            where P is operating profits, C is employees costs (total salaries and social expenses of employees), D+A are depreciation and amortization of assets.</p> <ul style="list-style-type: none"> <li>• Capital Employed Efficiency (CEE) = <math>VA/CE</math>; CE is physical capital + financial assets or equity + accumulated profit and liabilities.</li> </ul> <p>This is an indicator of how much value added is created by a dollar input of physical capital.</p> <ul style="list-style-type: none"> <li>• Human Capital Efficiency (HCE) = <math>VA/HC</math>; HC is employees costs or C.</li> </ul> <p>This is an indicator of how much value added is created by a dollar input of human capital.</p> <ul style="list-style-type: none"> <li>• Structural Capital Efficiency (SCE) = <math>SC/VA</math>; <math>SC = P + D + A</math> or <math>VA - HC</math></li> </ul> <p>SCE represents the proportion of total value added accounted for by structural capital.</p>	<p>Chen et al. (2005)            Kujansivu and Lonnqvist (2007)            Williams (2001)</p>

Profitability <b>(PROFIT)</b>	Return on equity, net profit to total shareholders' funds	Oliveira et al. (2006) Williams (2001)
Leverage <b>(LEV)</b>	Debt ratio defined as total debt to total assets	Barako et al. (2006) Haniffa & Cooke, (2002) Ku Ismail & Chandler (2005) White et al. (2007)
Market-to-book value <b>(MVBV)</b>	Ratio of MV/BV MV= Number of shares outstanding x Stock price at year end BV= Book value of stockholders' equity – Paid in capital of preferred stocks	Chen et al. (2005) Garcia-Meca et al. (2005) Li et al. (2007)
Firm size <b>(SIZE)</b>	Market value of equity shares	Bozzolan et al. (2003) Eng & Mak, 2003; Garcia-Meca et al., 2005; Oliveira et al., 2006; Owusu-Ansah, 1998; White et al., 2007

#### 4. Findings

The profile of the sample is reported in Table 3. It shows that 35.29% of the biggest 68 companies based on market capitalization in year 2006 are trading companies. Almost 77% of the sample is from trading, industry, finance and consumer product.

**Table 3: Profile of sample**

Industry type	Frequency	Percentage (%)
Trading (TRAD)	24	35.29
Industry (IND)	11	16.18
Finance (FIN)	9	13.24
Consumer Product (CP)	8	11.76
Construction (CONS)	5	7.35
Infrastructure (INFRA)	4	5.88
Plantation (PLANT)	4	5.88
Property (PROP)	3	4.42
Total	68	100.00

Table 4 reports descriptive statistics of the sample. The average mean of ICD is 751.94 score with a minimum of 247 score and a maximum of 2,215 score. All companies have relatively higher human capital efficiency (HCE) than structural and capital efficiencies. The average percentage of debt ratio to total assets (LEV) is considered high at 46.20% with the maximum of 94.14%. The variation in ICD, VAIC, HSE, ICE, and leverage are quite large whilst the variations found in SCE, CEE and LnSIZE are quite small.

**Table 4: Descriptive statistics**

	Mean	Min	Max.	SD	Skewness	Kurtosis
ICD	751.94	247	2215	421.89	1.26	1.67
VAIC	5.87	1.27	15.82	3.35	1.21	0.93
HCE	5.00	1.01	14.71	3.20	1.30	1.11
SCE	0.70	0.01	0.93	0.20	-1.65	2.88
CEE	0.18	0.02	0.73	0.13	1.52	3.77
ICE	5.69	1.07	15.65	3.34	1.20	0.97
PROFIT	16.38	-20.42	130.42	17.97	3.85	24.18
LEV	46.20	1.57	94.14	25.46	0.41	-0.70
LnMVBV	0.29	-0.57	1.35	0.34	0.64	1.34
LnSIZE	3.70	3.24	4.67	0.39	0.91	-0.22

N=68

Table 5 shows that there is positive and significant correlation between company leverage (LEV) and firm size (LnSIZE) with the disclosure of intellectual capital (ICD). CEE is not correlated VAIC and other components of VAIC. The correlation between other component of VAIC (HCE, SCE and ICE) with VAIC except for component CEE is high which is close to 0.70. Thus, in the following regression analysis, each component of VAIC is regressed separately with ICD to determine the influence of each component of VAIC on ICD.

**Table 5: Pearson Correlation of Variables**

Table 6 reports the regression analysis for the study in five models. Analysis shows that

	1	2	3	4	5	6	7	8	9	10
1. ICD	1									
2. VAIC	-0.201	1								
3. HCE	-0.206	0.998**	1							
4. SCE	-0.088	0.687**	0.654**	1						
5. ICE	-0.203	0.999**	0.999**	0.688**	1					
6. CEE	0.012	0.171	0.134	0.085	0.133	1				
7. LEV	0.375**	-0.129	-0.120	-0.066	-0.119	-0.261*	1			
8. LnSIZE	0.339**	0.132	0.132	0.136	0.135	-0.048	0.304*	1		
9. LnMVBV	0.175	0.096	0.073	0.088	0.076	0.539**	0.030	0.248*	1	
10. Profit	0.100	0.365**	0.331**	0.359**	0.339**	0.717**	0.065	0.818	0.543**	1

\* significant at 5%. \*\*significant at 1%

VAIC is negatively associated with ICD. Both firm size and leverage are positively associated with ICD in all models. When the component of VAIC is separately regressed in model 2, 3, 4 and 5, the results show that ICE, HSE and SCE are negatively associated with ICD whilst CEE has no association with ICD. PROFIT and LnMVBV are not related to IC disclosure.



**Table 6: Regression Analysis**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
VAIC	-29.533 (-1.954)*				
ICE		-28.138 (-1.818)*			
CEE		270.992 (0.436))			507.590 (0.819)
HCE			-30.865 (-1.979)*		
SCE				-247.088 (-0.970)	
PROFIT	1.843 (0.554)	0.356 (0.078)	1.660 (0.505)	0.581 (0.171)	-2.979 (-0.703)
LEV	4.276 (2.189)**	4.722 (2.174)**	4.315 (2.216)**	4.804 (2.435)**	5.760 (2.699)***
LnMVBV	105.002 (0.621)	79.591 (0.447)	103.054 (0.610)	131.232 (0.759)	111.218 (0.616)
LnSIZE	289.267 (2.134)**	301.929 (2.174)**	290.350 (2.143)**	266.460 (1.927)*	272.121 (1.938)*
Constant	-396.434 (-0.850)	-494.906 (-0.968)	-417.969 (-0.898)	-325.44 (-0.667)	-591.376 (01.142)
R <sup>2</sup>	0.254	0.257	0.255	0.220	0.217
Adjusted R <sup>2</sup>	0.194	0.184	0.195	0.157	0.154
F test	4.230***	3.520***	4.255***	3.504***	3.436***

\*significant at 10%. \*\*significant at 5%. \*\*\*significant at 1%

The negative relationship in model 1 support *H1* for the aggregate measure of VAIC and separate measure of ICE (*H1a*) and HCE (*H1b*). By analysing the component of VAIC independently, the results indicate that the negative relationship between VAIC and IC disclosure and between ICE and IC disclosure are influenced by human capital efficiency (HCE) and not by other components (SCE or CEE). In the intellectual capital efficiency (ICE), HCE is more important compared to the SCE. The physical assets efficiency (CEE) does not influence the IC disclosure. The finding suggests that when the value added by human capital increases, the company tends to reduce the IC disclosure for fear of losing competitive advantage to competitors. The finding supports the proprietary cost theory. The finding also supports the cost of disclosure as constraint in full disclosure which then affects the decision usefulness of the financial statement information to users. The finding for VAIC in this study to some extent is similar to the finding in Williams' (2001).

In relation to company characteristics, only leverage and company size are found positively related to IC disclosure which supports *H4* and *H5*. Company growth and

profitability do not influence IC disclosure. Finding in leverage suggests that the riskier the company the more information about the company's activities is required by the users to assist them to monitor the ability of the company to meet future obligations and the future growth of the company. With regards to firm size, the finding supports that big companies disclose more IC disclosure. One reason might be due to the companies have more resources which make them capable of having more IC disclosure. Another reason might be due to the political cost of the big companies which require them to disclose more information to meet the pressure groups' requirements.

## **5. Conclusions**

Findings of the study provide evidence that VAIC is negatively related to IC disclosure. However, when the components of VAIC are regressed separately, more informative evidence prevails about the influence of human capital efficiency compared to structural capital efficiency. Companies are reluctant to disclose IC disclosure when they reach a certain threshold of the IC performance. Thus, it is important for the accounting standard body and the enforcement agencies to ensure companies disclose IC elements in the annual reports either in narrative format or quantitative format.

The limitation of the study is the use of cross-sectional data. Panel data may provide more stable data and we can examine whether the incidence of reduced IC disclosure are related to the increase in VAIC components. Further researches should be conducted on the influence of corporate governance mechanisms (board of directors, audit committee and internal audit function) and ownership structure that influence the IC disclosure. Further studies may be conducted on examining the influence of regulation on the IC disclosure. It is interesting to know whether the negative relationship between IC performance and IC disclosure remains.

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