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Working Paper No 07/06

*April 2007*

# INTELLECTUAL CAPITAL DISCLOSURE IN KNOWLEDGE RICH FIRMS: THE IMPACT OF MARKET AND CORPORATE GOVERNANCE FACTORS

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**ABSTRACT**

Intellectual capital disclosure (ICD) in corporate annual reports has received growing European attention. To date, few studies have undertaken systematic analysis of the factors influencing the decision to disclose Intellectual Captial (IC) related information in annual reports. The purpose of this paper is to examine whether the level of hidden value (market-to-book ratio), share price volatility, listing age, board composition, ownership structure, audit committee size and directors' shareholding, in addition to other firm-specific factors influence ICD in 100 UK listed knowledge-rich firms. The dependent variable is measured by a 183 item index score, supported by word count and percentage of IC word count metrics to assess the extent, volume and focus of ICD respectively. Results of the analysis based on the three measures indicate significant association with hidden value, using market-to-book ratio as a proxy, and listing age. We further find firm size, share price volatility, director shareholding, audit committee size, and ownership concentration to be associated with ICD in a manner consistent with theoretical expectations. The implications of these findings, hitherto largely untested, are explored from a number of theoretical perspectives.

## 1. INTRODUCTION

Intellectual Capital (IC) represents a company's 'softer' assets such as human resources, know-how, intellectual property rights, manufacturing procedures, organisational structure, problem-solving capacity and internal and external relationships (Guthrie and Petty, 2000). Numerous authors have observed that with the advent of the information age and the virtual economy, knowledge and IC have taken on greater significance in creating competitive advantage and shareholder value[1]. Others have voiced the need for external communication[2], while yet others argue that conventional financial statements fail to reflect adequately intangible assets[3]. The majority of prior IC disclosure (ICD) studies focus on measuring the extent of IC information disclosed in corporate annual reports and few seek to identify specific characteristics determining the variation across firms. This study develops and analyses three ICD measures: *extent, volume and focus*. It undertakes a systematic analysis of the market, corporate governance and other firm-specific factors, influencing the decision to disclose IC related information in annual reports. We find that, as hypothesised, ICD is positively associated with firms' market-to-book ratio, share price volatility, firm size and size of audit committee, and is negatively associated with listing age, ownership concentration and directors' shareholding.

The remainder of this paper is organised as follows: the next section reviews the empirical literature on ICD. The hypothesis development is outlined in Section 3, followed by research design in Section 4. Section 5 presents findings on ICD practices and regression analyses and examines the working hypotheses. Section 6 concludes with limitations of the study and its implications.

## 2. PRIOR LITERATURE - IC DISCLOSURE STUDIES

The main prior ICD studies are typically cross-sectional and country specific[4], although some longitudinal studies have been reported[5]. Some studies focus on specific aspects of ICD, such as human capital reporting (Olsson, 2001; Subbarao and Zeghal, 1997; and Abeysekera and Guthrie, 2004); others conduct international comparative studies (e.g. Vandemaele et al., 2005; Vergauwen and Alem, 2005; Pablos, 2002; and Guthrie et al., 2006). While most studies employ content analysis as the research method, other ICD studies have used questionnaire surveys (e.g. Bontis, 1998; Bontis et al., 2000; Pablos, 2003; Gallego and Rodriguez, 2005).

Various prior studies have suggested that the level of ICD in annual reports is relatively low. Where it is found, it has been described as vague and discursive (Guthrie and Petty, 2000; Brennan, 2001; Bontis, 2003). The lack of an established and comprehensive ICD framework also makes interpretation difficult (Beattie and Thomson, 2006)[6]. However, longitudinal studies suggest an increasing trend in ICD over time (Williams, 2001; Vandemaele et al., 2005; Abeysekera and Guthrie, 2005). A recent ASB review on narrative reporting (2007) concludes that UK companies are generally good at providing descriptions of their business and markets, strategies and objectives, current development and performance, together with environmental, employee and social issues, although very few discuss contractual arrangements and relationships in depth. Some ICD studies have examined other communication channels. Garcia-Meca and Martinez (2005) and Garcia-Meca et al. (2005) examined the presentations to financial analysts and they found IC to be widely reported. Cordazzo's (2005) focus on environmental and social reports in Italy found IC statements to overlap with environmental and social reports.

To date, only a few ICD studies have been conducted among UK corporations (e.g. Beattie et al., 2002; Striukova et al., 2006; Williams, 2001). Beattie et al. (2002) undertook a study of the food sector, while Williams (2001) and Striukova et al. (2006) undertook cross-sectional studies.

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1 For example, Stewart (1997), Roos et al. (1997), Wiig (1997), Segelod (1998), Blair and Wallman (2001), Bontis et al. (2000), Litan and Wallison (2000), Sullivan (2000).

2 For example, OECD (1999), DATI (2001), FASB (2001a, b), Eccles et al. (2001), Mouritsen et al. (2001), Upton (2001), Roberts et al. (2005), Holland (2006), ASB (2007).

3 See Amir and Lev (1996), Lev and Sougiannis (1996), Lev and Zarowin (1999), Lev (2001).

4 Examples include studies in Australia (e.g. Guthrie and Petty, 2000; Sujan and Abeysekera, 2007), Ireland (Brennan, 2001), South Africa (April et al., 2003), Italy (Bozzolan et al., 2003), Malaysia (Goh and Lim, 2004), UK (Williams, 2001; Striukova et al., 2006), and Canada (Bontis, 2003).

5 For example, Williams (2001), Abeysekera and Guthrie (2005), Abdolmohammadi (2005), Vandemaele et al. (2005), and Vergauwen and Alem (2005).

6 Beattie and Thomson (2006) argue that the content analysis research method adopted in prior studies lacks transparency, specificity, uniformity and rigor of measurement in ICD. These deficiencies may give rise to misleading evidence.

The small sample sizes of most of these studies make rigorous statistical analysis of variables that affect ICD practice difficult. Looking beyond the UK, two studies have explored the relationship between 'hidden value' and ICD in corporate annual reports (Brennan, 2001; Miller and Whiting, 2005). The growing gap between market and book values of companies suggests that firms possess value-creating assets that are not adequately reflected in reported financial statements. This is particularly the case for IC intensive firms. The expectation is that companies with "hidden value" would voluntarily disclose more IC information in their annual report. However, little voluntary ICD was revealed in either study. Garcia-Meca et al. (2005) examined ICD in 257 analyst presentation reports of listed Spanish companies. Statistical analysis found size and type of meeting to be significant but not ownership diffusion, international listing status, leverage, market-to-book ratio, industry type, profitability and existence of investor relations department.

In terms of theory, Abeysekera (2006) argues that the development of a theoretical framework underlying ICD is in its infancy with few ICD studies providing any theoretical basis for interpreting their findings. The literature suggests a number of theoretical perspectives that may help explain the variation of ICD. Theories that have been considered include legitimacy and stakeholder (Guthrie et al., 2004; Abeysekera and Guthrie, 2005), signalling (Bozzolan et al., 2003; Garcia-Meca and Martinez, 2005), decision usefulness (Miller and Whiting, 2005), media agenda setting (Sujan and Abeysekera, 2007), resource based (Barney, 2001), agency (Bozzolan et al., 2003; Garcia-Meca and Martinez, 2005) and information asymmetry (Amir and Lev, 1996). It is apparent from the foregoing that the literature on the determinants of ICD is limited and inconclusive. Our study builds on the literature of ICD practice in the UK context and examines the relationship between ICD and factors such as stock market influences (market-to-book value, listing age, and share price volatility) and corporate governance characteristics (board composition, ownership diffusion, director shareholdings, and audit committee size), while controlling for other firm-specific characteristics (size and industry). The use of a comprehensive disclosure instrument and three different measures of ICD, add rigour to our findings.

## 3. DETERMINANTS OF ICD AND DEVELOPMENT OF HYPOTHESES

### Market Factors

#### *"Hidden Value" - Market-to-Book Ratio (M2B)*

Studies observe that improved corporate disclosures reduce information asymmetry (Welker, 1995; Coller and Yohn, 1997; Leuz and Verrechia, 2000). The greater the extent of disclosure, the better it aids future earnings prediction (Lundholm and Myers, 2002; Hope et al., 2006); reduces firms' cost of capital (Botosan, 1997; Sengupta, 1998); and gives rise to upward revisions in stock valuations, increased stock liquidity, and additional interest in the stocks by institutional analyst (e.g. Healy and Palepu, 1993, 2001; Skinner, 1994). Arguments drawn from information asymmetry suggest that ICD is likely to be greater where the hidden value is higher. Due to inability of conventional financial statement to reflect human, structural and relational capital, IC intensive firms are likely to exhibit a higher gap between market and book values (hidden value). To mitigate the information asymmetry, where specific knowledge is not effectively and efficiently transferable to investors through traditional accounting disclosures, high-growth-prospect firms provide disclosures through additional means (Frankel et al., 1999; Core, 2001). The above arguments lead us to hypothesize that:

*H1: There is a positive relationship between the level of ICD and firms' market-to-book ratio, ceteris paribus.*

#### *Share Price Volatility*

It is argued that the higher a firm's stock price volatility, the more difficult it is for investors to assess a firm's value, and the more likely they are to incur information costs (Foster, 1986). Holthausen and Verrecchia (1990) and Lang and Lundholm (1993) suggest a positive association between disclosure informativeness and price volatility. Debreceny and Rahman (2005) find firms with higher price volatility disclosing more regularly and frequently, while Bushee and Noe (2000) find evidence that firms' disclosure rankings are positively related to volatility. IC is increasingly recognized as a key driver of value creation and it is not surprising that fund managers use IC information to assess share prices (Holland, 2001). According to Amir and Lev (1996), non-financial information regarding corporate use of IC to generate competitive advantage is deemed highly value-relevant in explaining stock price movements. In addition, high IC intensive companies are more sensitive to market events than less IC intensive companies and as such, their share prices are expected to be more volatile (Lev and Sougiannis, 1999). Bozzolan et al. (2003) and Garcia-Meca and Martinez (2005) propose signalling theory to explain why firms do or do not convey to the market that they are creating hidden IC resources. Since ICD is expected to have a signalling effect and is positively associated with firms' stock price, we expect investors in high price volatility firms to reduce their information costs by demanding greater IC disclosures and management in high price volatility firms to signal their creation of hidden IC resources by providing greater IC disclosures. Hence, our next hypothesis is:

*H2: There is a positive relationship between the level of ICD and share price volatility, ceteris paribus.*

***Listing Age (AGE)***

The length of time a company has been listed on a capital market may be relevant in explaining the variation of disclosures (Haniffa and Cooke, 2002). Younger listed companies without an established shareholder base are expected to be more reliant on external fund raising than more mature companies (Barnes and Walker, 2006) and have greater need to reduce scepticism and boost investor confidence (Haniffa and Cooke, 2002). Research indicates disclosure of non-financial information is of greater importance in the valuation of younger companies (Kim and Ritter, 1999). The same applies to value relevant IC disclosure since it enhances the decision usefulness objective of financial reporting.[7] Company age has also often been used as a proxy for risk, and is therefore expected to be correlated with the extent of company disclosure (Bukh et al., 2005). Based on signalling theory, newly listed companies tend to disclose more value relevant information to lower the risk of being undervalued and to attract investments. Based on both decision usefulness and signalling theories, we expect younger listed firms to disclose greater IC information to enhance decision usefulness as well as to signal to the market the real value and prospects of the firm. Therefore, we hypothesize that:

*H3: There is a negative relationship between the level of ICD and listing age of firms, ceteris paribus.*

**Corporate Governance Mechanisms**

Disclosure changes are likely to coincide with changes in firm economics and governance (Healy and Palepu, 2001) and a well designed corporate governance structure promotes 'optimal' disclosure policy (Shleifer and Vishny, 1997). Corporate governance control mechanisms include board of directors, institutional shareholders, auditors and the market for corporate control (Keasey and Wright, 1993). While there is a significant body of research examining the influence of corporate governance on general disclosures, this has yet to be extended adequately to ICD. For the purpose of our study, we focus on board composition, share ownership, and audit committee size.

***Board Composition - Proportion of Non-Executive Directors***

Board composition is defined as the proportion of outside directors (non-executive) to the total number of directors (Haniffa and Hudaib, 2006). The role of the outside directors is perceived to be monitoring and controlling performance, enhancing the responsiveness of managers to investors and enforcing corporate compliance with disclosure requirements (Fama and Jensen, 1983; Mangena and Pike, 2005), as well as monitoring managerial opportunism (Jensen and Meckling, 1976; Leftwich et al., 1981), thus reducing agency risk (Bhojraj and Sengupta, 2003). Prior research supports the view that the proportion of independent directors is positively related to the board's ability to influence disclosure decisions (e.g. Beasley, 1996; Chen and Jaggi, 2000). Drawing on resource-based theory, Haniffa and Cooke (2005) argue for more non-executive directors on the board as they can provide wider expertise, prestige and contacts, therefore are expected to play a key role in influencing disclosure including IC information. However, they found a significant negative relationship between proportion of non-executive directors and extent of corporate social responsibility disclosure, suggesting that this may be due to the lack of experience and knowledge of non-executive directors, with indifferent societal concerns. Despite the inconclusive result, we hypothesize that:

*H4: There is a positive relationship between the level of ICD and representation of non-executive directors on board, ceteris paribus.*

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[7] Accounting Standards Board specifies the objective of general purpose external financial reporting as 'to provide information that is useful... in making investment, credit and similar resource allocation decisions (see Lennard, 2006).

***Ownership Structure - Share Concentration***

The power of stakeholders to influence management is a function of the resources they control that are essential to the corporation (Ullmann, 1985; Smith et al., 2005). Publicly traded firms have dispersed shareholders who demand governance to protect their residual claims, monitor management actions and limit opportunistic behaviour (Ashbaugh-Skaife et al., 2006). Agency theory argues that with greater ownership diffusion firms are more likely to experience pressure from shareholders for greater disclosure practices to reduce agency costs and information asymmetry (Raffournier, 1995; Cullen and Christopher, 2002). In contrast, firms with closely-held ownership are not expected to be responsive to public investors' information costs, since the dominant shareholders typically have access to the information they need (Cormier et al., 2005; Bushee et al., 2003). Almazan et al (2005) contend that firms with concentrated share ownership have less information asymmetry between management and large shareholders, as the latter can provide an active well functioning governance system that is difficult for smaller, more passive or less-informed investors. Results in prior studies indicate significant negative association between ownership concentration and engagement in environmental reporting practices (Cormier et al., 2005; Brammer and Pavelin, 2006) and ICD (Firer and Williams CGIC) of Singaporean firms. Based on agency arguments and some empirical support to date, we hypothesize that:

*H5: There is a negative relationship between the level of ICD and concentrated share ownerships, ceteris paribus.*

***Audit Committee Size***

The role of audit committees has developed over the years due to the need to meet the challenges of constantly changing business, social and economic environment (Vanasco, 1994). The Smith Report (2003) in the UK states the role of audit committees as ensuring that the interest of shareholders are properly protected in relation to financial reporting and internal control. It further recommends audit committees to review the significant financial reporting issues and judgments made in connection with the preparation of the company's financial statements, interim reports, preliminary announcements and related formal statements, e.g. operating and financial review and the release of price sensitive information. As such, audit committees can be expected to have an impact on value relevant information disclosure, including IC.

In order to perform their role effectively, audit committees should have adequate resources and authority to discharge their responsibilities and a minimum membership of three non-executive directors was suggested (Smith Report, 2003). Bedard et al. (2004) argue that the larger the audit committee, the more likely it is to uncover and resolve potential problems in the financial reporting process but they find no significant relationship between audit committee size and earnings management. However, Felo et al. (2003) find a positive relationship between audit committee size and the quality of financial reporting. In short, the empirical evidence is mixed[8] but based on agency theory and given the increasing importance of ICD, we expect audit committees to have greater responsibility in overseeing ICD practice. Hence, we hypothesize that:

*H6: There is a positive relationship between the level of ICD and audit committee size, ceteris paribus.*

***Directors' Shareholding***

Agency theory views directors' ownership as an effective mechanism to realign the executive directors' decision-making and disclosure attitudes since it provides them with the impetus needed to act in the best interests of all shareholders, including themselves (Vafeas and Theodorou, 1998; Demirag et al., 2000; Nam et al., 2006). Adrem (1999) suggests that when managers hold only a small fraction of shares, more disclosures can be expected based on agency theory and Bukh et al. (2005) support the view that board of directors who do not have substantial shareholdings encourage intensive auditing and disclosure practices for role fulfilling purposes. Mangena and Pike (2005) argue that the insider trading rules increase the incentives for the directors to provide more disclosure but found no empirical evidence to support their argument. On the other hand, O'Sullivan (2000) argues that when there is significant managerial ownership, less disclosure can be expected, due to the merging of the functions of ownership and management in such firms and consequently minimizing the monitoring motivation for disclosure. While the findings are inconclusive, we tentatively offer the following hypothesis:

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8 See Mangena and Pike (2005).

*H7: Level of ICD is associated with directors' shareholdings, ceteris paribus.*

**Control Variables**

***Size***

Firm size is an important determinant of the extent of information disclosure (Roberts et al., 2005). Larger entities have greater economic significance, and encompass greater public and regulatory scrutiny (Watts and Zimmerman, 1986; Firth, 1979) and are likely to disclose more information to reduce political costs and raise capital (Chow and Wong-Boren, 1987; Lang and Lundholm, 1993). Agency costs increase with the amount of outside capital (Jensen and Meckling, 1976), which tends to be higher for larger firms (Leftwich et al., 1981)[9], suggesting a positive relation between size and the extent of voluntary disclosures. In addition, proprietary costs are argued to be inversely related to size because managers of small firms are more likely than managers in large firms to feel that full disclosure will put their firms at a competitive disadvantage (Singhvi and Desai, 1971; Firth, 1979). Some studies found size to have a significant effect on ICD (e.g. Guthrie et al., 2006; Bozzolan et al., 2003; Garcia-Meca et al., 2005; Garcia-Meca and Martinez, 2005) while Williams (2001) and Bontis (2003) found size to be insignificant. While prior findings are mixed, it is important to control for the size effect, hence we hypothesize that:

*H8: There is a positive relationship between the level of ICD and firm size, ceteris paribus.*

***Type of Industry (IND)***

Industry characteristics may influence a firm's disclosure decisions (Roberts et al., 2005; Botosan, 1997; Nagar et al., 2003). Empirical studies suggest that the industry effect on ICD is mixed. Williams (2001) and Sujan and Abeysekera (2007) found significant industry effect. Striukova et al. (2006) found the retail sector to have the highest level of ICD. Bontis et al. (2000) found that the interplay between human and structural capital was industry sector dependent. However, several other empirical findings suggest no significant effect of industry on ICD (e.g. Bozzolan et al., 2003; Garcia-Meca et al., 2005). It is therefore unclear whether there is a significant industry effect or whether the differences, where observed, could be due to the lack of representativeness in sampling at sector level. We hypothesize that:

*H9: Level of ICD is associated with type of industry, ceteris paribus.*

## 4. RESEARCH METHOD

### 4.1. Sampling Design

Annual reports have been widely used in ICD studies (e.g. Guthrie and Petty, 2000; Brennan, 2001; Williams, 2001; Olsson, 2001; Bozzolan et al., 2003; Guthrie et al., 2004; etc.) because they are major public document that has significant influence on the way financial markets and the general public perceives and reacts to a company (Anderson and Epstein, 1995). The inclusion of voluntary information in the annual report can be, and is, used by managers to send specific signals and messages to the public (Salancik and Meindl, 1984; Brown and Deegan, 1999). It has also been emphasised that the inclusion of information in the corporate annual report is used to persuade readers to accept management's view of society (Amernic, 1992) and that annual reports are both reflective and constitutive of a wider set of societal values (Dyball, 1998). Therefore, this study examines ICD in corporate annual reports covering the period from March 2004 to February 2005.

This is a cross-sectional study of UK fully listed companies on the London Stock Exchange (LSE). Seven industry sectors were selected, most of which are generally regarded as having high IC (Pharmaceuticals & Biotechnology, IT, Telecommunications, Business Support Services, Media & Publishing, Banking & Insurance) except for the Food Production & Beverage sector, which is not particularly IC intensive. This provided us with a population size of 319 companies, from which a sample size of 100 was selected. The number of companies in each industry group is not the same and proportionate stratified sampling was applied to improve precision (Moser and Kalton, 1996). Table 1 presents a summary of the sample selection of each sector.

### 4.2. Development of the Research Instrument

A scoring sheet was prepared based on previous literature on IC definition and classification under three themes: *human capital (HIC), structural capital (SIC) and relational capital (RIC)*[10]. The majority of previous ICD studies have adopted or adapted Guthrie and Petty (2000) 24 attributes ICD framework. However, to achieve greater variation of ICD Index, we devise a more detailed IC checklist

[9] In terms of cost of information provision, cost per unit of size decreases (Lang and Lundholm, 1993).

[10] Bontis, 1998; Edvinsson and Malone, 1997; Edvinsson and Sullivan, 1996; Lynn, 1998; Roos et. al., 1997; Stewart, 1997; Brookings, 1997; Sveiby, 1997; Meritum, 2002.

[11] We also used the 24 attribute framework and scored annual reports and we found it to be less sensitive compared to our comprehensive research instrument.

**TABLE 1 SAMPLE SELECTION**

| | Industry Category | No. Companies | 100 Samples | Proportion |
|---|---|---|---|---|
| 1 | BPH | 40 | 13 | 32% |
| 2 | IT | 60 | 19 | 32% |
| 3 | Telecom | 18 | 6 | 33% |
| 4 | BSS | 83 | 26 | 31% |
| 5 | M&P | 45 | 14 | 31% |
| 6 | BI | 51 | 15 | 29% |
| 7 | F&Bev | 22 | 7 | 32% |
| | **Total** | **319** | **100** | **31%** |

**Abbreviations for sectors:**
Pharmaceuticals & Biotechnology (PHB)
Information Technology (IT)
Telecommunications (Telecom)
Business Support Services (BSS)
Media & Publishing (M&P)
Banking & Insurance (B&I)
Food Production & Beverage (F&Bev)

(see Appendix), capturing information in the forms of text, numerical and graphical/pictorial[11].

### 4.3. Measurement of Variables

#### *4.3.1. Measurement of Dependent Variables*

The lack of rigor in measures for the IC information captured could lead to potentially misleading results (Beattie and Thomson, 2006). Hence, in this study, the dependent variable, ICD[12], is measured using three different metrics: disclosure index (ICDI) to indicate the *extent*; word count (ICWC) to represent the *volume*; and word count as a percentage of annual report word count (ICWC%) to indicate *focus* or *emphasis* in the annual report. Our approach in scoring the items in the research instrument for the purpose of the disclosure index is essentially dichotomous in that an item scores one if disclosed and zero, if it is not. To aid consistency of scoring, the research instrument was completed by one researcher and to increase reliability of measurement, rescoring was done on a random selection of firms some months after initial analysis. The scores for each item were then added and equally weighted[13] to derive a final score for each company. The intellectual capital disclosure index $ICDI_j$ for each company is calculated as follows:

$$ICDI_j = \frac{\sum_{t=1}^{n_j} X_{ij}}{n_j}$$

where $n_j$ = number of items expected for $j^{th}$ firm, $n_j$ = 183,
$X_{ij}$ = 1 if $i^{th}$ item disclosed,
0 if $i^{th}$ item not disclosed,
so that $0 \leq ICDI_j \leq 1$.

The use of dichotomous procedure in scoring the instrument for the disclosure index has been criticized by some because it treats disclosure of one item (regardless of its form or content) as being equal, and does not indicate how much emphasis is given to a particular content category. As such, the use of word count is seen as partly able to overcome such problem. Zeghal and Ahmed (1990) indicate that words are the smallest unit of measurement for analysis and can be expected to provide the maximum robustness to the study in assessing the quantity of disclosure. Therefore, to capture the *volume* of IC content, this study introduces another form of ICD measure, namely word count (ICWC). Using the

[12] Two main measures have been adopted for coding and measuring ICD: dichotomous (0:1) which is mainly for examining the presence of IC items (e.g. Bontis, 2003); and frequencies of IC items' occurrence (Guthrie and Petty, 2000; Brennan, 2001).

[13] Some IC studies used weighted coding schemes, which give uneven scores for quantitative and qualitative information (e.g. Bozzolan, et al., 2003; Sujan and Abeysekera, 2007). In this study the items were not weighted because of potential scoring bias and scaling problems and is consistent with Cooke (1989) and Ahmed and Nicholls (1994).

same research instrument, the number of words relating to each IC item in the checklist was counted and added together to arrive at ICWC for each company. Graphical and pictorial messages were excluded from the word count measure.

Krippendorf (1980) further notes that words are a preferred measure when it is intended to measure the amount of total space devoted to a topic and to ascertain the importance of that topic. Although word count is not assumed to be representative of the quality of disclosure, it is assumed to be indicative of the overall responsiveness by corporate management.[14] In other words, the greater the amount of words related to IC being disclosed in relation to the total amount of words in the annual reports, the greater the emphasis given by management on IC information. Hence, we introduced a third measure, ICWC%, which was computed by dividing total IC word count with the total word count of the whole annual report[15]. This measure captures the IC focus in the annual report. For example, a firm with a short annual report may have a low ICDI and ICWC but a high ICWC%, conveying to the reader the importance of IC.

#### 4.3.2. Measurement of Independent Variables

The independent variables are categorized into three groups: market, corporate governance and other firm specific factors. Table 2 presents a summary of the operationalisation of the independent variables considered in this study as well as their source of information.

**TABLE 2 INDEPENDENT VARIABLES, MEASUREMENT AND SOURCE OF INFORMATION**

| | Variable | Proxy | Measurement | Source |
|---|---|---|---|---|
| **Market Factors** | | | | |
| 1 | Hidden Value (IC Value) | Market-to-book ratio (M2B) | Stock market price over stockholders' equity. The ratio of the financial year end. | Thomson One |
| 2 | Length of Listing on LSE | Listing Age (AGE) | Number of days listed scaled by 365 days a year. | LSE |
| 3 | Share Price Volatility | High/Low Price Difference (PVOL) | Difference between the highest and lowest share price during the study period, scaled by the lowest share price (Bushee et al., 2003; Frankel et al., 1999). | Thomson One |
| **Corporate Governance Factors** | | | | |
| 4 | Board Composition | Outside Directors (NEX) | Number of non-executive directors on board divided by total number of directors on board. | Annual Report |
| 5 | Ownership Structure | Share Concentration (SCONEX) | Cumulative share holdings by individuals or organizations classified as substantial shareholders (currently a 3% stake required by the Companies Act 1985) to the total number of outstanding common shares. | Annual Report |
| 6 | Internal Auditing Mechanism | Audit Committee Size (ASIZE) | Number of directors on board in Audit Committee. | Annual Report |
| 7 | Directors' Shareholding | Directors' Shareholding (DSHLD) | Number of shares held by board directors divided by total number of shares outstanding. | Annual Report |
| **Control Variables** | | | | |
| 8 | Company Size | Sales | Sales revenue of financial year 2004 | Thomson One |
| 9 | Industry | Type of Industry (IND) | Dummy variables for each of the sectors sampled. | LSE |

[14] This assumption is based on the belief that management has editorial control of content when a large number of demands for inclusion of information are likely to exist (O'Donovan, 1996). Annual reports are time consuming and costly to produce, and management must rationalise the competing demands for space. As a result space must be allocated on the basis of some perception of the importance of information to report users

[15] The number of words in the whole annual report are counted to arrive at total annual report word count.

### 4.4. Data Analysis

#### 4.4.1. Models

Multiple regression is used to test the relationship between ICD (based on the three measures) and the various independent and control variables. To assess the extent of multicollinearity problem, the partial correlation (controlling sales as proxy for size)[16] was reviewed and the variance inflation factor (VIF) computed. Table 3 presents the partial correlation matrix.

It can be seen from the correlation matrix that all variables showed significance for at least one ICD measure. The correlations between independent vaariables are all below the multicollinearity threshold of 0.80 suggested by Judge et al. (1988). Market-to-book ratio is highly significant for all three measures of ICD[17]. Price volatility shows significant positive association with ICDI and ICWC%, but not for ICWC; listing age only shows significance for ICWC%; audit committee size has significant impact on ICDI and ICWC, but not on ICWC%; board composition shows significant correlation with ICWC, and weak association with ICDI and ICWC%; the negative association between directors' shareholding and ICD is significant for ICWC, but weak for ICDI and insignificant for ICWC%; share ownership concentration shows significant negative relationships with all three ICD measures. Normality tests based on skewness and kurtosis for all dependent and independent variables were conducted[18]. Kolmogorov-Smirnov Lilliefors (K-S) test, which is a test of goodness of fit (Siegel, 1956) was also conducted for all variables[19]. An analysis of residuals, plots of the studentized residuals against predicted values as well as the Q-Q plot were conducted to test for homoscedasticity, linearity and normality assumptions. The regression equation is as follows:

$$ICD = \beta_0 + \beta_1 X_{1i} + \beta_2\ \beta_{2i} + \beta_3\ X_{3i} + \ldots + \beta_{15}\ X_{15i} + \varepsilon_i$$

Where ICD = IC Disclosure Index (ICDI), IC Word Count (ICWC), or IC Word Count Percentage (ICWC%);

$X_1$ = Market-to-book ratio (proxy for hidden value);
$X_2$ = Share Price Volatility (proxy for informativeness);
$X_3$ = Listing Age;
$X_4$ = Proportion of Non-Executive Directors on Board (proxy for board composition, %);
$X_5$ = Cumulative Shareholding by Significant Shareholders i.e. holding more than 3% of total shares outstanding each) to total shares outstanding (%);
$X_6$ = Audit Committee Size (total number of directors on the audit committee) (proxy for internal auditing function);
$X_7$ = Directors' Shareholding to Total Shares Outstanding (%)
$X_8$ = Sales (proxy for firm size);
$X_9$ = 1 if the company is in the Pharmaceutical, Biotechnology or Health sector; 0 if otherwise;
$X_{10}$ = 1 if the company is in the IT sector; 0 if otherwise;
$X_{10}$ = 1 if the company is in the Support Services sector; 0 if otherwise;
$X_{12}$ = 1 if the company is in the Media and Publishing sector; 0 if otherwise;

**TABLE 3 PARTIAL CORRELATIONS (CONTROLLING SIZE EFFECT- SALES AS A PROXY)**

| Control | | ICDI | ICWC | ICWC% | M2B | PVOL | AGE | ASIZE | NEX | DSHLD | SCONEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SALES | ICDI | 1 | 0.719** | 0.603** | 0.302** | 0.264** | -0.122 | 0.273** | 0.190• | -0.185• | -0.248* |
| | ICWC | | 1 | 0.688** | 0.361** | 0.118 | -0.052 | 0.394** | 0.308** | -0.303** | -0.253* |
| | ICWC% | | | 1 | 0.270** | 0.280** | -0.204* | 0.143 | 0.171• | 0.034 | -0.196• |
| | M2B | | | | 1 | 0.038 | 0.159 | 0.252* | 0.155 | -0.164 | -0.047 |
| | PVOL | | | | | 1 | -0.247* | 0.019 | 0.023 | 0.069 | 0.044 |
| | AGE | | | | | | 1 | 0.150 | 0.013 | -0.266** | -0.004 |
| | ASIZE | | | | | | | 1 | 0.267** | -0.231* | 0.033 |
| | NEX | | | | | | | | 1 | -0.373** | 0.128 |
| | DSHLD | | | | | | | | | 1 | -0.263** |
| | SCONEX | | | | | | | | | | 1 |

** = significant at .01 level, * = significant at .05 level, • = significant at .10 level

16 Due to the significant effect of size on level of disclosure and other variables, the partial correlation (controlling for size effect) was considered to be more appropriate for identifying the marginal effects of other factors that were significantly correlated to ICD.

17 Given the importance of market-to-book ratio in our study, and the fact that profitability and financing strategy are often cited as value drivers, it was decided to exclude ROA and leverage from the regression models.

18 A rule of thumb for skewness and kurtosis is that skewness of ±1.96 and kurtosis of ±2 indicate normality.

$X_{13}$ = 1 if the company is in the Telecommunications sector; 0 if otherwise;
$X_{14}$ = 1 if the company is in Banking and Insurance sector; 0 if otherwise;
$X_{15}$ = 1 if the company is in the Food and Beverage sector; 0 if otherwise;
$\beta$ = parameters;
$\varepsilon_i$ = error term; and
i = the $i_{th}$ observation
Note: $X_1$- $X_3$ = variables for market factors; $X_4$- $X_7$ = variables for corporate governance factors; $X_8$ = Control Variable; $X_9$- $X_{15}$ = dummy variables for industry.

## 5. DISCUSSION OF RESULTS

### 5.1. Descriptive Statistics

Descriptive analyses of each measure of ICD and continuous independent variables for the sample companies are shown in Table 4.

The mean aggregate IC word count (ICWC) is 10,488 words, which accounts for 26.3% of the overall annual report word count (ICWC%). ICDI ranges from 0.16 to 0.56 with an aggregate mean of 0.36; ICWC ranges from 1,234 to 51,430 words and ICWC% ranges from 8.9% to 42.6%. Samples selected cover both large and small firms with average sales revenue of £4037 million for financial year 2004. Turning to the means of market predictor variables for sample firms, we observe the market-to-book ratio, listing age and share price volatility to be 3.9, 17 years and 0.81, respectively. The means for the corporate governance variables indicate over half of the board in our sample consists of non-executive directors. The majority of the sampled companies have more than 3 board directors on the audit committee, suggesting complying with recommended best practice. The mean for the cumulative significant shareholdings (excluding significant directors' shareholding) and directors' shareholding is 30% and 9%, respectively. It can be seen in the table that both ICDI and ICWC% are normally distributed but not the ICWC as indicated by standard tests on skewness and kurtosis, and further supported by K-S Lilliefors. As such, the dependent and continuous independent variables that were not normally distributed have been transformed[20].

### 5.2. Regression Results

Table 5 summarised the OLS regression results for all three IC measures. The ICDI model produced an adjusted $R^2$ of 63%.

All three market factors examined i.e. market-to-book ratio, listing age were significant at the 5% level and price volatility were significant at the 1% level. With the exception of board composition, all other corporate governance factors examined were significant: size of audit committee and directors' shareholding at the 5% level and share concentration at the 1% level. Sales, proxy for firm size, was significant at the 1% level. Results do not show any significant industry effect on ICDI.[21]

**TABLE 4 DESCRIPTIVE STATISTICS FOR DEPENDENT AND INDEPENDENT VARIABLES (UNTRANSFORMED)**

| Variables | Mean | Median | Min | Max | SD | z-test skewness | z-test kurtosis | K-S Lilliefors |
|---|---|---|---|---|---|---|---|---|
| **Dependent variables:** | | | | | | | | |
| ICDI | 0.36 | 0.36 | 0.16 | 0.56 | 0.08 | 0.90 | -0.99 | 0.08 |
| ICWC | 10488 | 8551 | 1234 | 51430 | 8901.2 | 9.46 | 12.87 | 0.19** |
| ICWC% | 0.263 | 0.259 | 0.089 | 0.426 | 0.072 | 0.792 | -1.064 | 0.05 |
| **Independent variables:** | | | | | | | | |
| ***Market Factors*** | | | | | | | | |
| Hidden Value (M2B Ratio) | 3.89 | 2.59 | 0.52 | 17.81 | 3.48 | 7.72 | 7.28 | 0.216** |
| Listing Age (AGE) (Years) | 17.15 | 10.69 | 0.45 | 71.87 | 16.71 | 6 | 2.58 | 0.188** |
| Share Price Volatility (PVOL) (Ratio) | 0.81 | 0.59 | 0.16 | 3.73 | 0.74 | 9.05 | 10.62 | 0.192** |
| ***Corporate Governance Factors*** | | | | | | | | |
| Board Composition (%) (NEX) | 0.56 | 0.57 | 0.25 | 0.85 | 0.12 | -0.41 | 0.6 | 0.129** |
| Ownership Concentration (%) (SCONEX) | 29.63 | 26.05 | 0 | 79.2 | 19.55 | 2.19 | -1.44 | 0.115** |
| Audit Committee Size (Number) (ASIZE) | 3.46 | 3 | 1 | 7 | 1.06 | 2.07 | 1.51 | 0.248** |
| Directors' Shareholdings (%) (DSHLD) | 0.089 | 0.011 | 0.00006 | 0.688 | 0.164 | 9.54 | 9.6 | 0.326** |
| ***Firm-Specific Factor*** | | | | | | | | |
| Size (SALES) £m | 4036.68 | 383.05 | 0.00[22] | 39792.17 | 8782.39 | 11.17 | 13.77 | 0.347** |

** = significant at .01 level, * = significant at .05 level • = significant at .10 level

[19] K-S Lilliefors with significance of >.05 indicates that the distribution is approximately normal (Haniffa and Cooke, 2002)

[20] All variables that are not normally distributed were transformed using logarithm transformation, apart from share concentration (transformed using square root transformation, due to the type of the data).

[21] Media and publishing sector is only weakly significant at less than 10%.

[22] The company is an active trading company focusing on Research and Development. Although there were no sales recorded during 2004 financial year, contracts were signed.

**TABLE 5 REGRESSION RESULTS FOR THREE ICD MEASURES (ICDI, ICWC, ICWC%)**

| | Predicted Sign | | ICDI | | | ICWC | | | ICWC% | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | VIF | Beta | T | Sig. | Beta | t | Sig. | Beta | t | Sig. |
| (Constant) | | | | 6.40 | 0.00 | | 23.89 | 0.00 | | 4.84 | 0.00 |
| M2B | + | 1.21 | 0.15 | 2.16 | 0.03 | 0.17 | 2.65 | 0.096 | 0.25 | 2.55 | 0.01 |
| PVOL | + | 1.78 | 0.22 | 2.75 | 0.007 | 0.04 | 0.58 | 0.57 | 0.20 | 1.75 | 0.08 |
| AGE | - | 1.44 | -0.16 | -2.21 | 0.03 | -0.16 | -2.30 | 0.02 | -0.28 | -2.67 | 0.009 |
| ASIZE | + | 1.66 | 0.17 | 2.11 | 0.04 | 0.19 | 2.62 | 0.01 | 0.04 | 0.32 | 0.75 |
| SCONEX | - | 1.51 | -0.28 | -3.76 | 0.00 | -0.24 | -3.38 | 0.00 | -0.23 | -2.09 | 0.04 |
| DSHLD | +/- | 2.36 | -0.24 | -2.51 | 0.01 | -0.25 | -2.85 | 0.005 | -0.02 | -0.16 | 0.88 |
| NEX | + | 1.58 | 0.02 | 0.31 | 0.76 | 0.09 | 1.31 | 0.19 | 0.11 | 1.02 | 0.31 |
| SALES | + | 2.98 | 0.51 | 4.87 | 0.00 | 0.41 | 4.21 | 0.00 | 0.24 | 1.57 | 0.12 |
| PHB | +/- | 1.68 | -0.04 | -0.50 | 0.62 | 0.14 | 1.95 | 0.06 | 0.12 | 1.04 | 0.30 |
| IT | +/- | 1.77 | 0.00 | -0.01 | 0.99 | 0.16 | 2.15 | 0.03 | 0.20 | 1.69 | 0.09 |
| M&P | +/- | 1.45 | 0.13 | 1.77 | 0.08 | 0.09 | 1.28 | 0.20 | -0.03 | -0.26 | 0.79 |
| Telecom | +/- | 1.39 | 0.00 | -0.07 | 0.95 | 0.07 | 1.05 | 0.30 | -0.02 | -0.23 | 0.82 |
| B&I | +/- | 1.59 | 0.00 | 0.04 | 0.97 | 0.11 | 1.59 | 0.12 | -0.13 | -1.18 | 0.24 |
| F&Bev | +/- | 1.28 | 0.02 | 0.29 | 0.77 | 0.11 | 1.64 | 0.11 | 0.20 | 2.03 | 0.05 |
| Std Error | | | 0.050 | | | 0.411 | | | 0.063 | | |
| *F* Value | | | 12.96 | | | 16.05 | | | 3.20 | | |
| Sig. *F* | | | 0.000 | | | 0.000 | | | 0.000 | | |
| $R^2$ | | | 0.681 | | | 0.726 | | | 0.345 | | |
| **Adjusted $R^2$** | | | **0.629** | | | **0.680** | | | **0.237** | | |

*Note:* The coefficients of the excluded dummy variables are all 1.000 since they act as benchmarks for the included dummies. The excluded dummy variable for industry sector is business support services sector.

ICWC model produced an adjusted $R^2$ of 68%. The results showed market-to-book ratio, share concentration, sales and directors' shareholding to be significant at the 1% level, while audit committee size and listing age were significant at the 5% level. Unlike the model based on ICDI, price volatility and board composition were found to be insignificant. IT sector was found to be disclosing more IC word count than the rest of the sectors. The explanatory power of the ICWC% model is somewhat weaker (adjusted $R^2$ of only 24%) compared to the other two models. Only market-to-book ratio, share concentration and listing age showed significant association at the 5% level. Other corporate governance factors viz. audit committee size, board composition, and directors' shareholding are all insignificant, but in the direction as predicted. Industry shows some impact on companies' ICD focus in annual reports with food & beverage being significant at less than 10% level. One possible explanation for food & beverage firms having greater focus on ICD is due to disclosure on brands related information. The findings for ICWC% indicate significant impact of market related factors and less significant impact of corporate governance on the focus of ICD in annual reports, apart from the shareholders' pressure for disclosure.

### 5.3 Discussion of hypotheses testing

Here we summarise the effects of the examined independent variables on ICD measures, namely, *extent* (ICDI), *volume* (ICWC) and *focus* (ICWC%).

Market-to-book ratio was expected to be one of the major determinants for ICD. All three measures of ICD support our hypothesis (H1) that the greater the market-to-book ratio (hidden value), the greater the ICD. Previous studies generally revealed far weaker results (see Brennan, 2001; Miller and Whiting, 2005; and Garcia-Meca et al., 2005). Our findings offer support for the arguments drawn from information asymmetry, decision usefulness and signalling theories that companies with greater hidden value (IC) will disseminate more IC related information to signal the market their real value drivers, leading to more rationale decision makings by investors.

Share price volatility shows significant positive association with ICDI and marginal effect on ICWC%, but no effect on ICWC. This supports our proposed hypothesis (H2) that companies with more volatile share prices tend to be more IC intensive, hence disclose greater extent IC related information, to signal the market of the firm's real value and potential. This is in line with the findings of Debreceny and Rahman (2005) in a context of continuous corporate disclosure. The result also supports that companies with more volatile share prices tend to be more focused on ICD in corporate annual reports, which signals the importance of IC to such companies. One of the reasons why ICWC is not significantly related to share price volatility may be due to its significant association with firm size.

Listing age was hypothesised to be negatively associated with the level of ICD (H3) and was supported by the regression results of all three ICD measures. This is different from the insignificant relationship found between listing age and voluntary disclosure in Haniffa and Cooke (2002). This may be due to the highly value-relevant and decision useful nature of IC information that younger listed firms are more open and keen to disclose in order to signal to the market its value and growth potential.

Board composition (H4) is not significant in explaining any of the three ICD measures. The finding is in line with Brammer and Pavelin (2006) that number of non-executive directors has no impact on environmental disclosure. Share ownership concentration showed significant negative associations with all three measures of ICD as hypothesised. The finding supports our proposed hypothesis (H5) that companies with less diffused share ownership have less pressure for value relevant disclosure as the information is withheld between the management and large shareholders. This supports the agency theory argument and is line with the findings of Firer and Williams CGIC.

Audit committee size is found to be positively associated with ICDI and ICWC, supporting our proposed hypothesis (H6) that larger audit committees tend to have greater ICD. These results confirm prior study findings (e.g. Felo et al., 2003). The positive relationship supports both agency and resource dependency theory that the more the resources allocated to the internal audit function, the more efficient the committee is to oversee value-relevant information disclosures, which then could reduce agency costs. The finding indicates that audit committees have an impact on ICD. This conforms to the suggestion made by the Smith Report (2003) that audit committee has responsibility to oversee document like operating and financial review, which is highly IC related. However, audit committee size is not significant in explaining ICWC%, which suggests that the function of the committee is still limited to what should be covered but not down to the detail of the focus of annual report on ICD. Directors' shareholding shows significant negative relationships with ICDI and ICWC, but not ICWC%, supporting our hypothesis (H7). The

**MARKET FACTORS**

| Hypotheses | Predicted sign | Actual sign | Hypothesis support | | |
|---|---|---|---|---|---|
| | | | ICDI *(Extent)* | ICWC *(Volume)* | ICWC % *(Focus)* |
| Market-to-Book (H1) | + | + | Moderate | Strong | Strong |
| Share Price Volatility (H2) | + | + | Strong | None | Weak |
| Listing Age (H3) | - | - | Moderate | Moderate | Strong |

Strong = significant at .01 level, Moderate = significant at .05 level, Weak = significant at .10 level

**CORPORATE GOVERNANCE FACTORS**

| Hypotheses | Predicted sign | Actual sign | Hypothesis support | | |
|---|---|---|---|---|---|
| | | | ICDI *(Extent)* | ICWC *(Volume)* | ICWC % *(Focus)* |
| Board composition (H4) | + | + | None | None | None |
| Share Concentration (H5) | - | - | Strong | Strong | Moderate |
| Audit committee size (H6) | + | + | Moderate | Strong | None |
| Directors' shareholdings (H7) | +/- | - | Strong | Strong | None |

Strong = significant at .01 level, Moderate = significant at .05 level, Weak = significant at .10 level

**CONTROL VARIABLES**

| Hypothesis | Predicted sign | Actual sign | Hypothesis support | | |
|---|---|---|---|---|---|
| | | | ICDI *(Extent)* | ICWC *(Volume)* | ICWC % *(Focus)* |
| Sales (H8) | + | + | Strong | Strong | None |

Strong = significant at .01 level, Moderate = significant at .05 level, Weak = significant at .10 level finding suggests that the greater the directors' shareholding, the less willing they become to give information, which can be explained by the management entrenchment effect. When the shareholding becomes very significant, they have even less pressure and incentive for external ICD.

With respect to firm size effect, using sales revenue as a proxy, it is found to be significant for ICDI and ICWC, but not ICWC%. The findings for ICDI and ICWC are in line with prior ICD studies (e.g. Guthrie et al., 2006; Bozzolan et al., 2003; Garcia-Meca et al., 2005) that found it to be positively influenced by firm size. This supports stakeholder, legitimacy and agency theory that large companies tend to be under greater pressure for disclosure. Greater disclosure both enables management to legitimize themselves and reduces agency costs. The finding also suggests that the focus on ICD in corporate annual reports (ICWC%) is not determined by company size.

***Industry (H9)***

The results also lend some support towards industry effect on ICD showing that IT sector discloses the most in terms of *volume* of ICD; and food and beverage sector puts greater *focus* on ICD than the rest, mainly due to great emphasis on brand disclosure. Industry effect on the *extent* of ICD is only marginal with media and publishing sector disclosing slightly greater *extent* of ICD than other sectors.

## 6. SUMMARY AND CONCLUSIONS

Disclosure practice is a complex process, affected by a broad set of factors (Archambault and Archambault, 2003; Haniffa and Cooke, 2002), both internal and external (Holland and Stoner 1996; Gibbins et al., 1990). This paper has examined whether the extent of Intellectual Capital disclosure (ICD) in 100 annual reports of UK listed knowledge-rich companies is associated with market, corporate governance and some firm-specific factors. Results based on the regression model for all three ICD measures indicated that all three groups of variables were associated with one or more ICD measure. The significant positive association for market-to-book ratio indicates the importance of hidden value (IC) as determinant of ICD by all three measures. The significance of price volatility (+) and listing age (-) further supports the decision usefulness and signalling theory arguments that ICD is influenced by market factors.

Turning to corporate governance mechanisms, we find confirmation for our share concentration (-), audit committee size (+) hypotheses, underpinned by agency theory arguments. In contrast, directors' shareholding showed significant negative association, suggesting a management entrenchment effect; when directors have significant shareholdings, the incentive for them to disclose value-relevant information declines and less ICD is expected. In such circumstances, only appropriate director equity compensation plans might encourage optimal incentive plans for the best interest of vast investment community.

The findings confirm prior literature regarding the firm size impact on ICD in annual reports, due to the greater pressure for information, and the greater need of legitimization for the management from larger firms. However, size does not affect the focus on ICD (ICWC%) in annual reports, where smaller IC intensive firms could put more emphasis on disclosing information on the most important assets. The result indicates the importance of ICD that even smaller companies (where word in annual report is very important and competitive among vast range of information that could be disclosed) put a great deal of effort on ICD.

Hence, we suggest that as well as the extent of ICD, it is meaningful to measure each firm's focus (ICWC%) to examine the real prominence of IC in firms. We argue that this measure is of relative importance, particularly because firm size is typically positively associated with disclosure. Some industry differences were also found in this study; the IT sector disclosed more IC by word count while the beverage sector placed greater focus on ICD.

There are several limitations in this study. Firstly, the disclosure scoring sheet is self developed, which is different from prior studies, causing difficulty for comparison. Secondly, the study only focuses on IC disclosure practice in corporate annual reports. Finally, there are other factors that affect companies' IC disclosure practices that have not been examined in this study, which could be explored in further in future studies.

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## APPENDIX
## RESEARCH INSTRUMENT - IC CHECKLIST

| | HIC | | RIC | | SIC |
|---|---|---|---|---|---|
| 1 | Number of Employees | 1 | Customers | 1 | Intellectual property |
| 2 | Employee age | 2 | Market presence | 2 | Process |
| 3 | Employee diversity | 3 | Customer relationships | 3 | Management philosophy |
| 4 | Employee Equality | 4 | Customer acquisition | 4 | Corporate culture |
| 5 | Employee Relationship | 5 | Customer retention | 5 | Organization Flexibility |
| 6 | Employee Education | 6 | Customer training & education | 6 | Organization structure |
| 7 | Skills/Know-how/Expertise/Knowledge | 7 | Customer involvement | 7 | Organization learning |
| 8 | Employee work related competences | 8 | Company Image/reputation | 8 | Research & Development |
| 9 | Employee work-related knowledge | 9 | Company awards | 9 | Innovation |
| 10 | Employee Attitudes/Behaviour | 10 | Public relation | 10 | Technology |
| 11 | Employee Commitments | 11 | Diffusion & Networking | 11 | Financial Relations |
| 12 | Employee motivation | 12 | Brands | 12 | Customer support Function |
| 13 | Employee productivity | 13 | Distribution channels | 13 | Knowledge-based infrastructure |
| 14 | Employee Training | 14 | Relationship with suppliers | 14 | Quality management & improvement |
| 15 | Vocational qualifications | 15 | Business collaboration | 15 | Accreditations (certificate) |
| 16 | Employee development | 16 | Business agreements | 16 | Overall infrastructure/capability |
| 17 | Employee flexibility | 17 | Favourite contract | 17 | Networking |
| 18 | Entrepreneurial spirit | 18 | Research collaboration | 18 | Distribution Network |
| 19 | Employee Capabilities | 19 | Marketing | | |
| 20 | Employee teamwork | 20 | Relationship with stakeholders | | |
| 21 | Employee Involvement with community | 21 | Market leadership | | |
| 22 | Other Employee Features | | | | |

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