



# Determinants of intellectual capital disclosure: evidence from Australia

Determinants of intellectual capital disclosure

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## Abstract

**Purpose** – The purpose of this paper is to examine determinants of the decision to disclose intellectual capital in annual reports.

**Design/methodology/approach** – The paper derives theoretical predictions from the previous literature and bases the study on archival data with a sample of 125 publicly listed Australian firms. The authors perform a content analysis of annual reports and complement the data with quantitative data from the sample firms.

**Findings** – The paper finds that industry type plays a key role as a determinant for the disclosure of intellectual property in annual reports. In addition, firm size is another determinant for intellectual disclosure of firms. In contrast with earlier studies and theoretical predictions of voluntary disclosure, however, the paper does not find any relationship between the level of information asymmetry and intellectual capital disclosure.

**Research limitations/implications** – One limitation refers to the content analysis. Analyzing the annual reports based on the specified list of IC-related terms may not provide the whole picture as well as the IC disclosure practices. Despite these limitations, the study helps to understand better in general what kind of firms actually disclose information on intellectual capital.

**Originality/value** – In contrast with earlier studies the study uses significantly more observations, which makes the results more reliable and generalizable. Of further significance is the finding that information asymmetry – one of the main problems between investors and firms – is not driving the decision of firms to disclose information on intellectual capital.

**Keywords** Disclosure, Intellectual capital, Financial reporting

**Paper type** Research paper



## 1. Introduction

The purpose of this study is to examine determinants of the disclosure of intellectual capital (IC) in annual reports. IC plays an increasingly important role in sustaining competitive advantages and creating corporate value (Bollen *et al.*, 2005). As a consequence, companies have increased their investments in IC. Given the increased

importance of IC in the economy but inadequate information on IC assets in the financial statements of firms, some researchers argue that the relevance of these statements have decreased over time (Francis and Schipper, 1999). Present accounting standards do not require the recognition of IC in the financial statements and only a relatively low level of firms disclose IC in their annual reports (FASB, 2001). As a result, there is a growing level of information asymmetry between companies and users of financial statements.

Various studies attempt to conjecture the extent at which companies disclose their IC information voluntarily. However, there is mixed evidence on the determinants of voluntary IC disclosure. Aboody and Lev (2000) find that there are larger gains from insider trading in R&D-intensive firms compared to other firms. Boone and Raman (2001) conclude that R&D-intensive firms have less liquid markets for their shares, which suggests that market liquidity will improve for these firms with more extensive IC disclosure. Hence, despite difficulties in measuring IC as indicated by Lambert (1998), there must be reasons for firms to disclose IC. Voluntary disclosure could help to decrease information asymmetry, to decrease the cost of capital and to improve reputation. Bukh *et al.* (2005) find that IC disclosure in Danish IPO firms is considered as relevant information for investors and as important information of a firm's strategy. However, financial analysts prefer more disclosure on strategy than on IC (Bukh *et al.*, 2005). Despite an increasing stream of research on intellectual capital, clear results on the determinants of IC disclosure are still scarce.

With a sample of 125 publicly traded Australian firms we find that the industry type plays a key role as determinant for the disclosure of intellectual property in annual reports. In addition, firms size is another determinant for intellectual disclosure of firms. In contrast to earlier studies and theoretical predictions of voluntary disclosure, however, we do not find any relationship between the level of information asymmetry and intellectual disclosure.

We believe that our study has several contributions to the literature. First, we confirm earlier findings on determinants of intellectual capital disclosure. Second, our result that information asymmetry is not related to the level of IC disclosure is an important empirical finding that shows that the role of information asymmetry plays less of a role than assumed in much of the disclosure literature. Third, with a larger sample size we overcome some problems of earlier studies on the determinants of IC (Guthrie and Petty, 2000; Brennan, 2001; Williams, 2001).

Our study proceeds as follows: in the next section we develop the theoretical background and the hypotheses of this study. After that, we provide empirical results. The final section discusses the results and concludes this study.

## 2. Theoretical background

### 2.1 Intellectual capital reporting

In a "knowledge-based" economy, the source of companies' economic value no longer depends on the production of material goods but on the creation and manipulation of intellectual capital (Guthrie *et al.*, 2004).

In an attempt to overcome the inadequacy of the traditional financial accounting framework to reflect the value of IC, researchers and practitioners have been endeavoring to find new measurement methods and models of IC reporting such as Technology Broker, Skandia Navigator, Intangible Assets Monitor, or the IC – Index.

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However, these models are frequently considered as too firm specific (Bontis, 2001). There are no specific guidelines or regulations concerning the measurement and reporting of IC. In fact, IC measurement complexities make it difficult for IC to be incorporated into the prevailing accounting framework and accounting standards do not allow a full recognition and disclosure of IC components (Meer-Kooistra and Zijlstra, 2001).

The aforementioned limitations of the financial accounting standards and extant IC practices result in discussions about IC standardization and disclosure mandate. Essentially, it is very difficult to standardize “soft” intangibles (Lambert, 1998). In addition, a voluntary standard would be more appropriate and flexible than the compulsory one because of the currently rapid change of intellectual capital (Grojer and Johanson, 1999). Brennan and Connell (2000) argue that the conservatism of accounting for intangibles indicates the little chance of regulators to develop a standard for intellectual capital. On providing disclosure issues recommended by the Financial Accounting Standard Board (FASB), Bontis (2003) holds that it is unlikely for IC disclosure to be mandated. Supporting the arguments for voluntary IC disclosure, Vergauwen and van Alem (2005) contend that the limitation of the asset definition in current accounting regulations may adversely influence shareholders’ decision making and material misstatement. Obviously, voluntary IC disclosure is an appropriate approach for companies to meet stakeholders’ IC information needs. In addition to the difficulties of measuring and reporting IC, related costs and negative consequences are considered to be high. A firm might be at the competitive disadvantage position owing to its publication of competition sensitive information (Backhuijs, 1999; Meer-Kooistra and Zijlstra, 2001; Vergauwen and van Alem, 2005). Though this is an indirect cost, it is of indubitably important factors affecting a company’s operation. The reduction of management flexibility might result from the extensive IC disclosure.

However, despite the difficulties related to IC disclosure, there are several reasons for firms to disclose information on intellectual capital. The reduction of information asymmetry between a company and external users of information is one major reason for voluntary IC disclosure. According to Andriessen (2004), information asymmetry may result in the misallocation of capital, which eventually leads to social costs such as unemployment or reduced productivity. Also, the inadequacy of traditional financial accounting leaves average investors at a disadvantage compared with knowledge insiders, leading the company to be at the risk of insider trading (Leadbeater, 1999; Vergauwen and van Alem, 2005). A reduction of information asymmetry has advantages, such as lower costs of capital. The reduction in borrowing costs is due to stakeholders’ better estimates of firm risk and a larger pool of potential investors (Bontis, 2003; Andriessen, 2004; Vergauwen and van Alem, 2005). Moreover, the better assessment and belief of the company’s future wealth creation capabilities might raise the company share price, and thus the market capitalization (Williams, 2001).

Furthermore, IC disclosure can help to increase the value relevance of financial statements. Failures to provide relevant information about intellectual capital may lead to a deterioration of the company’s financial position and a loss of competitiveness in the long run (Canibano *et al.*, 1999). In fact, investors have difficulties in accurately assessing firm value for resource allocation with financial statements that do not report intellectual capital. Likewise, managers may find it difficult to determine relevant intangible investments needed for the company’s operations. As a consequence, the

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provision of relevant information to managers and other users of financial statements can become important.

Companies are also motivated to disclose IC information to create trustworthiness with employees and other stakeholders (Backhuijs, 1999; Meer-Kooistra and Zijlstra, 2001; Bornemann and Leitner, 2002). By publishing IC-related information, the company might prevent disadvantages from rumours and gossips (Bornemann and Leitner, 2002, p. 13). According to Prusak and Cohen (2001), the establishment of trust is one of the most important factors in the company's long-term growth strategies because it creates stakeholders' higher commitment to the company future, especially in turbulent times.

In addition, reporting IC information can be used as the company's marketing tool (Meer-Kooistra and Zijlstra, 2001, p. 468). Edvinsson (1997) stated that in a major proportion of well established companies such as Intel, Microsoft and Netscape, there are substantial differences between market values and book values, which he calls the hidden values. By disclosing IC information, these companies can publicly provide evidence about their true values and their wealth creation capabilities, which in turn may enhance the company's reputation.

### *2.2 Evidence on the determinants of voluntary intellectual capital disclosure*

Guthrie and Petty (2000) consider a sample of 19 top Australian listed companies by market capitalization and one IC best practice company to investigate IC voluntary disclosure in Australia. Built on Sveiby's (1997) framework of IC classification for a content analysis (involving the codification of IC information in the annual reports in accordance with a selected framework of intellectual capital indicators), Guthrie and Petty find that IC attributes are expressed discursively and qualitatively rather than quantitatively and that no definite IC reporting framework has been established. Despite its contribution to Australian IC disclosure literature, the study is only limited to the results of 20 out of over 1,600 companies listed on Australian stock exchange.

There have been several studies in different countries utilizing the same methodology as Guthrie and Petty (Brennan, 2001; Bozzolan *et al.*, 2003; April *et al.*, 2003; Goh and Lim, 2004; Abeysekera and Guthrie, 2005). Although these studies all indicate the lack of a consistent IC reporting framework and the extensive disclosure of external capital, some differences in terms of the extent of IC disclosure can be found across companies. For example, in Brennan (2001), IC related items in the sample of 11 knowledge-based Irish listed companies are disclosed less frequently than those in Guthrie and Petty's sample. However, their sample is very small so that results must be considered with caution. Likewise, different proportions of IC categories (human capital, internal capital and external capital) are found in Sri Lanka compared to those in Guthrie and Petty's study. In essence, these studies use the same framework, but the results are different, which may be due to differences in time, sample sizes, country-specific regulations and culture.

Different from the above studies that examined IC disclosure practices with controls over company sizes (led by market capitalization and profits) or company types (knowledge based companies), Bontis (2003) conducts a large scale investigation of 10,000 Canadian corporations' annual reports. An analysis of a list of IC-related terminology reveals a relatively low IC disclosure level compared to Scandinavian firms.

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Williams (2001), examines annual reports of 31 FTSE 100 listed companies in UK from 1996-2000. He observes significant variations in the amount of IC disclosure among companies and that corporate specific factors such as leverage, industry exposure and listing status influence the IC disclosure level.

Developing an intellectual capital disclosure index based on Brooking's (1996) model, Beaulieu *et al.* (2002) examine the quantity of IC in 30 randomly selected Swedish listed companies. There are considerable variations in the extent of IC disclosure among the examined companies. Moreover, the study indicates that there is a positive relationship between company size and the amount of IC disclosure. Such a relationship is supported by Garcia-Meca *et al.* (2005). However, this relationship is not supported by Bontis (2003).

Bozzolan *et al.* (2003) investigate the annual reports of 30 nonfinancial companies listed in the Italian Stock Exchange in 2001. Adopting Guthrie and Petty's (2000) framework with some modifications, they conclude that company size and industry influence the amount of IC disclosure in Italian companies.

Some other influential factors have been mentioned in the prior studies. Chaminade and Roberts (2003) propose that culture may determine the emergence of IC management and reporting, and suggest cross-country guidelines cannot be established without the recognition of cultural characteristics. Furthermore, in Vergauwen and van Alem's (2005) study, the authors conclude that accounting regulations and auditor conservatism might be the reasons for the differences.

Based on the above discussion it becomes obvious that the determinants of IC disclosure are not clearly known, yet. However, similar to studies by Brennan (2001), Williams (2001) and Bozzolan *et al.* (2003) we propose that industry type is an important factor for IC disclosure as intellectual capital is in some industries more important than in others and therefore value-relevant for investors. This leads to the first hypothesis:

*H1.* The type of industry is a determinant for IC disclosure.

Based on the mixed results with respect to the variable size as determinant for IC disclosure by Bontis (2003), Beaulieu *et al.* (2002) and Bozzolan *et al.* (2003), we state our second hypothesis in null-form:

*H2.* There is no relationship between company size and the level of IC disclosure.

Furthermore, the level of information asymmetry could play an important role for a firm to disclose information on intellectual capital. The less control investors have over the management of a firm, which is an indication of high levels of information asymmetry, the more important become disclosure of value-relevant information, such as information on intellectual capital. We predict the following relationship:

*H3.* Information asymmetry is positively related to the level of IC disclosure.

### **3. Empirical evidence**

#### *3.1 Sample, data selection, and descriptive statistics*

Our sample consists of Australian firms that are publicly listed on Australian stock exchanges. We use the Global Industry Classification Standard (GICS) as a guideline to classify the sample companies into the following industries:

- energy;
- materials (chemicals, construction materials, containers and packaging, metals and mining, and papers and forest products);
- industrials (capital goods, commercial services and supplies, and transportation);
- consumer discretionary (automobile and components, consumer durables and apparel, hotels, restaurants and leisure, media, and retailing);
- health care (health care equipment and services, pharmaceuticals and biotechnology);
- financials (banks, diversified financials, insurance, and real estate);
- information technology (software and services, technology hardware and equipment, semiconductors and semiconductor equipment);
- telecommunication services; and
- utilities (MSCI, 2005)[1].

For each of the sample companies, we use annual reports as the source of the necessary data. A total of 15 companies were randomly selected from each industry in Australia. For those industries, which have less than 15 companies satisfying the above requirements, the maximum number of satisfied companies was chosen. These industries are energy (14 observations), telecommunications (11 observations), and utilities (ten observations). Our final sample consists of 125 companies with an average asset size of 3.7 million AUS\$[2]. Our analysis is as follows: First, we conduct a content analysis to scrutinize the IC reporting practices of the relevant firms. Then, we specify an Ordinary Least Square (OLS) regression model to test our hypotheses.

### *3.2 IC reporting practice measurement*

The choice of intellectual capital language will be the antecedent signal for the development of intellectual capital statements (Bontis, 2003).

The extent of IC disclosure is measured by a modified methodology of Bontis (2003) and Vergauwen and van Alem (2005). That is, the 38 intellectual capital related terms collected by researchers in the World Congress on Intellectual Capital are classified into three categories of intellectual capital:

- (1) *Human capital*: “the tacit knowledge embedded in the minds of the employees”;
- (2) *Structural capital*: “the organizational routines of the business”; and
- (3) *Relational capital*: “the knowledge embedded in the relationships established with the outside environment” (Edvinsson and Sullivan, 1996).

Because of the presence of some general terms related to the field of intellectual capital, we place these terms into the fourth category called General terms. Table I shows the relevant terms of IC used in this study.

We use the count of IC related words as the unit of the content analysis because of better comparison of different annual reports (Gao *et al.*, 2005). We then aggregate the disclosure frequencies of occurrence to determine the quantity of IC disclosure.

We first analyze the content of the annual reports. The results are shown in Table II, where the number of hits is summarized in accordance with the classification



General terms	Human capital	Structural capital	Relational capital
Economic value added	Employee expertise	Structural capital	Relational capital
Intellectual capital	Employee know-how	Intellectual property	Supplier knowledge
Intellectual resources	Employee knowledge	Cultural diversity	Customer knowledge
Intellectual asset	Employee productivity	Organizational culture	Customer capital
Knowledge asset	Employee skill	Corporate learning	Company reputation
Knowledge stock	Employee value	Organizational learning	
Intellectual material	Human capital	Corporate university	
Intellectual capital	Human asset	Knowledge sharing	
Business knowledge	Human value	Management quality	
Competitive intelligence	Expert team	Knowledge management	
		Information system	
		Expert network	

**Table I.**  
Intellectual capital:  
related terms

IC category	2002	2003	2004
Human capital	1	8	8
Structural capital	248	226	253
Relational capital	1	0	0
General IC terms	9	6	14
Total	259	240	275

**Table II.**  
Number of disclosed  
items

categories. Structural capital is the most frequently disclosed category, whereas hardly any disclosure of the relational capital category can be found.

Of the disclosure of 36 IC related terms, only 15 terms appear in the annual reports of Australian listed companies. Of those terms, “intellectual property” (IP) is disclosed most frequently with 195 hits in the annual reports of 36 Australian companies in 2004. Considering the total sample of 125 companies, the number of companies disclosing “intellectual property” implies the intellectual capital consciousness. Although some kinds of intellectual property are required to be disclosed on the financial statements such as patents, trademarks and copyrights, understanding its strategic role might enable a company to sustain its competitive advantage (Smith and Hansen, 2002). Besides intellectual property, “information system” is the second most frequently reported term in annual reports.

Scrutinizing across industries indicates different level of IC disclosure among sample firms. Specifically, high-tech industries such as Health Care, Information Technology, and Telecommunication Services were among the industries aggressively provided IC information.

In terms of disclosure location, IC information is reported in diverse sections in the annual reports. Notably, this information is extensively mentioned in financial statements and notes to financial statements, followed by IC being revealed in the director’s report and operation reports in the annual reports. Intellectual capital work is mostly managed by senior management (Bontis, 2001), so the location of IC disclosure demonstrates companies concerns of reporting intellectual capital. This is consistent with the finding of Lev and Zambon (2003) who concludes that the extensive research

work on intellectual assets over the past ten years has created awareness about the importance of IC. Bontis (2003) also states that companies have increasingly realized the importance of IC disclosure.

However, investigating IC disclosure in Australia, Guthrie and Petty (2000) conclude that key intellectual capital components in Australia companies are “poorly understood, inadequately identified, inefficiently managed, and not reported in a consistent framework”. With a larger sample size, our study confirms the conclusion by Guthrie and Petty.

### 3.3 Regression model

We specify the following Ordinary Least Square (OLS) regression model for our analysis (Model 1):

$$\begin{aligned} \text{IC Disclosure} = & \beta_0 = \beta_1 \text{Energy} + \beta_2 \text{Materials} + \beta_3 \text{Industrials} \\ & + \beta_4 \text{Consumer Goods} + \beta_5 \text{Healthcare} + \beta_6 \text{Financials} \\ & + \beta_7 \text{IT} + \beta_8 \text{Telecommunication} + \beta_9 \text{Size} + \beta_{10} \text{Leverage} \\ & + \beta_{11} \text{Information Asymmetry} + \varepsilon_1 \end{aligned}$$

where *IC Disclosure* is the measure of the extent of IC disclosure. This measure indicates the number of terms related to intellectual capital occurring in the annual report of a firm. The intercept reflect the model with the utilities industry. Using utilities as benchmark treatment, the variables from  $\beta_1$  to  $\beta_8$  are the coefficients of dummy variables for the other eight industries considered in our sample: energy, materials, industrials, consumer discretionary (CD), health care (HC), financials, information technology (IT), and telecommunication services (TS). Each variable takes the value of one for each industry respectively and 0 for the others. In addition, we add the following variables:

- (1) *Size*, measured by the natural logarithm of total assets.
- (2) *Leverage*, calculated by the Debt-to-Equity ratio. Higher leveraged companies are usually subject to higher demands for information from creditors and shareholders than the lower leveraged ones, inducing these companies to disclose more information (Camfferman and Cooke, 2002). The necessity for voluntary disclosure is especially important in the knowledge based company where substantial amounts of money are invested in intangible assets and intellectual capital, which are not fully recognized on the financial statements.
- (3) *Information asymmetry*, indicating the percentage of stock not held by the 20 largest shareholders of a firm. We use this variable as a proxy for information asymmetry.

Results of our regression model are shown in Table III. The only statistically significant coefficients are those of the variables *Size* ( $\beta_9 = 0.28$ ,  $p < 0.05$ ) and the dummy variables for *Health Care* firms ( $\beta_5 = 6.31$ ,  $p < 0.01$ ) and *IT* firms ( $\beta_7 = 5.27$ ,  $p < 0.01$ ). This supports *H1*, which states that the industry type is a determinant of IC disclosure. There is thus support for our model that industry type plays an important role in IC disclosure. Firms of the health care industry and firms of the information technology industry disclose significantly more on intellectual capital compared to those firms of other industries. Further, results suggest that the size of a firm has an influence



Independent variable	Model 1 (n = 125)	Model 2 (n = 125)	Determinants of intellectual capital disclosure
Intercept	-1.61 <sup>a</sup>	-0.94 <sup>b</sup>	<b>241</b>
Size	0.28 <sup>**</sup>	0.16 <sup>*</sup>	
Leverage	-0.07	0.00	
Information asymmetry	-1.06	-0.65	
Energy	-0.06		
Materials	-0.60		
Industrials	-0.49		
Consumer goods	-0.38		
Health care	6.31 <sup>***</sup>	2.81	
Financials	-0.82		
IT	5.27 <sup>***</sup>	8.34 <sup>**</sup>	
Telecommunication	0.97		
Health care × Information asymmetry		7.22	
IT × Information asymmetry		-8.21	
R-square adjusted	0.40	0.40	

**Notes:** \*\*\*, \*\*, \* is statistically significant at the 1 percent, 5 percent and 10 percent level, respectively (two-tailed); <sup>a</sup> The intercept indicates the influence of utilities on the level of IC disclosure; <sup>b</sup> The intercept indicates the influence of industries other than Health care and IT on the level of IC disclosure

**Table III.**  
OLS regression on IC disclosure

on the level of IC disclosure, which supports the findings of Garcia-Meca *et al.* (2005) but does not support H2. In addition, the coefficient for  $\beta_{11}$  is not significant ( $\beta_{11} = -1.06$ ,  $p > 0.10$ ), which suggests that the level of information asymmetry does not have an influence on the level of IC disclosure. To investigate the role of information asymmetry further, we specify the following OLS regression model (Model 2):

$$\begin{aligned} \text{IC Disclosure} = & \beta_0 + \beta_1 \text{Healthcare} + \beta_2 \text{IT} + \beta_3 \text{Size} + \beta_4 \text{Leverage} \\ & + \beta_5 \text{Information Asymmetry} + \beta_6 \text{Healthcare} \times \text{Information Asymmetry} \\ & + \beta_7 \text{IT} \times \text{Information Asymmetry} + \varepsilon_2 \end{aligned}$$

where all variables are specified as in model 1. Results of this model are shown in Table III. To examine the role of information asymmetry on the level of IC disclosure, we add two interaction terms with an interaction between *Health Care* industry and *Information Asymmetry* and between *IT* and *Information Asymmetry*. The results of model 1 indicate that information asymmetry does not play an important role. However, the extent of information asymmetry could play a role only for those two industries that are related to more IC disclosure.

The coefficients for the two interactions are both not significant ( $\beta_6 = 7.22$ ,  $p > 0.10$ ;  $\beta_7 = -8.21$ ,  $p > 0.10$ ), which confirms that the level of IC disclosure is not related to the level of information asymmetry. *H3* is therefore thus not supported.

### Discussion and conclusion

With a sample of 125 publicly listed Australian firms, we find that industry type is an important determinant of the disclosure level of IC. More specifically, industries that

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rely more on IC disclose more information on IC. This is an important signal to investors, which indicates the relevance of IC for some firms (and industries). For industries where IC is a key value driver, this information is relevant for investment decisions and for other stakeholders. Consequently, for a good analysis investors and other stakeholders need to analyze in detail the content of IC disclosures in industries where IC disclosure is common. More specifically, due to the common practice in certain industries to disclose IC in general, not only the extent of IC disclosure but also the specific content of the IC disclosure becomes crucial for the analysis of a firm for investment decisions, for example.

Furthermore, our results support the findings of Garcia-Meca *et al.* (2005) that size is also a determinant for IC disclosure. This result stand alone is probably less relevant for investors, but an interesting contribution to the literature. Whereas previous literature has provided mixed evidence on the relationship between company size and IC disclosure, our study with a significantly larger sample size reveals that company size is related to the level of IC disclosure.

In addition, we find empirical evidence that the level of IC disclosure is not related to the level of information asymmetry, which is at odds with traditional arguments on voluntary disclosure. In our sample firms do not disclose information on IC in order to inform investors with less insight in the firm. Rather, IC disclosure is a matter of common practice in certain industries irrespective of the level of information asymmetry between management and investors. It seems that the disclosure practice in the health care and IT industry (*HI*) is strongly dominating the decision to disclose information on IC. This disclosure practice, which is specific to some industries, is more important than individually different levels of information asymmetry. More specifically, following the general practice of an industry is more important than addressing information asymmetry with disclosure practice.

Our study is subject to a number of limitations. One limitation refers to the content analysis. Analyzing the annual reports based on the specified list of IC related terms may not provide the whole picture as well as the IC disclosure practices. Next, although we believe that our sample is representative for Australian listed firms, a larger sample could help to improve the generalizability of this study further. In addition, a longitudinal study could provide more insights and could include not only levels of IC disclosure but also an analysis of changes in IC disclosure.

In spite of some existing limitations, our study contributes to the intellectual capital disclosure literature in several ways. First, IC disclosures are industry specific. Second, this study confirms earlier findings on the role of company size on the level of IC disclosure. Further, we find that information asymmetry is not related to the level of IC disclosure. Moreover, our study has a significantly larger sample size and therefore overcomes one major drawback of several earlier studies on the determinants of IC disclosure.

#### Notes

1. Media could be classified as high-tech and should be in the Telecommunication Services sector. This classification might, to some extent, influence the result of our empirical studies.
2. We believe that this sample allows general conclusions on publicly listed firms in Australia. However, relative to the whole population of Australian listed firms some industries might be underrepresented, whereas others are completely covered in our sample. Nevertheless,

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due to a random procedure of selecting firms we believe that an underrepresentation of some industries relative to others does not have implications for the quality of the results of this study (see Lukka and Kasanen, 1995, for a further discussion on the generalizability of samples).

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