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Rimmel, Gunnar; Nielsen, Christian; Tadanori, YosaNO

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Gunnar Rimmel
Christian Nielsen
Tadanori Yosano

UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

www.handels.gu.se

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Gunnar Rimmel, Göteborg School of Business, Economics and Law[1]

Christian Nielsen, Aalborg University

Tadanori Yosano, Kobe University

[1] Corresponding author: School of Business, Economics and Law, University of Gothenburg; P.O. Box 610, SE-405 30 Gothenburg, Sweden; E-mail: gunnar.rimmel@handels.gu.se

Abstract

In this paper, we analyse the disclosure of information in a sample Japanese initial public offering (IPO) prospectuses primarily with respect to voluntary disclosure of non-accounting information on knowledge-based resources – also called intellectual capital. Differences in reporting practice, especially with respect to IPO's, however, reflect to a major degree differences in institutional settings, culture and traditions. In addition, this paper analyzes underpricing, long-term performance and the cost of capital. The methodology used in the analysis is a disclosure index consisting of 78 items. Disclosure index research in accounting and business reporting practices has been widely applied, because such studies represent an aspect of disclosure quality. Based on statistical analysis, it will be examined to what extent of managerial ownership prior to the IPO, industry type, company size and age affect the amount of voluntary intellectual capital disclosure. The results are interpreted in the light of the increasing importance of disclosing information on value drivers, strategy and intellectual capital to the capital market and constitute a contribution to the ongoing debate on corporate reporting practices. Finally the paper discusses the future prospects on IC reporting from an international point of view, based on the empirical findings.

Keywords: Disclosure, intellectual capital, IPO prospectuses, Japan

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Introduction

Since more than a decade much research and many studies have been pointed out that the traditional business reporting model is in the need to go beyond traditional financial reporting that put emphasis on historical, quantified, financial information (e.g. Eliott, 1992; AICPA, 1994; Wallman 1995, 1996, 1997; ICAS, 1999; Lev & Zarowin, 1999; Eustace, 2001; FASB 2001; Lev, 2001; ICAEW, 2003; Gu & Lev, 2004). Over the past decades, companies' disclosure of information has gained increased attention due to globalisation and integration of capital markets, greater mobility of monetary and actual goods, tougher competition, new dominating industries, and developments in IT and the Internet. Consequently, the demand for external communication applies to both traditional accounting and newer types of reporting such as intellectual capital statements, supplementary business reporting and prospectuses.

A comprehensive set of intellectual capital (IC) studies observe that there is no consensus on a precise definition `intellectual capital´, as the terms `intangibles´ and `IC´ are frequently used interchangeably or synonymously (Rylander, Jacobsen & Ross, 2000; Lev, 2001, Meritum, 2002; Lev & Zambon 2003; Marr, Schiuma & Neely, 2004). Despite the lack of an agreed definition of IC, a broad consensus that IC comprises three major elements: human capital, structural capital and relational capital, exists. Rylander and Peppard (2003) state that these elements allow a holistic view of all company's value-creating resources. Nonetheless, effective IC communication needs information on the drivers of long-term performance and information on the strategy of the firm (Rylander *et al.*, 2003).

During the past years, manifold Scandinavian examples on leading IC practice evolved from the first corporate IC statement of the Swedish insurance company Skandia in 1995 to the 2003 IC reporting framework proposed and tested by the Danish Ministry of Science, Technology and Innovation (Rimmel, 2004). Although a large stream of research on IC has been generated, up to now there are only few Japanese examples available (see Koga et al. 2006.).

Consequently, the aim of the present paper is to give an indication of the importance of intellectual capital information in Japanese initial public offering (IPO) prospectuses from all stock exchange listings at the Japan Stock Exchange from 2003.

The remainder of this paper is structured as follows. First recent developments in business reporting are discussed and it is argued that the IPO prospectuses should be studied in order to gain insight into the need for disclosure. Further, the section presents the factors that will be taken into consideration in explaining differences in disclosure. In the following two sections the methodology and the available data is described. The results are interpreted in the light of the increasing importance of disclosing information on value drivers, strategy and intellectual capital to the capital market and constitute a contribution to the ongoing debate on corporate reporting practices. Finally the paper will based on the empirical findings analyse future prospects on IC reporting from an international point of view.

Corporate reporting, communication and the IPO prospectus

information set that the traditional financial statements constitute. Lev and Zarowin (1998) as well as Francis and Schipper (1999) directly relate such a loss of informativeness of traditional financial statements' to the growth of intangible assets in playing a major role in the generation of corporate value. A common example of the contribution made by IC to corporate value is given by comparing market and book values. Lev's (2001) study of the average market-to-book ratio of the S&P 500 index from 1977 to 2000 has been frequently quoted as it reported a strong upward trend culminating in a value in excess of 6.0 by 2000. In other words, for every $6 of market value, only $1 appears on the balance sheet. The 1997-2000 "dot.com" boom was followed by the well-known bubble burst with dramatically plunging of share prices after year 2000.

This brings to mind that one has to be careful with not exaggerating values when dealing with intangible assets. Yet, a more recent study revealed that the S&P 500's average market-to-book ratio declined to 4.5 by September 2003 (Gu & Lev, 2004), which still is a rather large difference. There is a corresponding body of research that indicates that capital market actors are continuously intrigued by information about intangibles (Holland & Johansson, 2003). Grasenick & Low (2004) stated that the disclosure of intangibles measurement receives also its power from the fact that they are drivers of values that can be measured and evaluated by management.

The external communication of companies' intellectual capital has been altered into basically two approaches: either to integrate IC in an extended traditional balance sheet or to create a complementary IC statement (Rylander *et al.*, 2000). The recognition of IC in the balance

sheet is often deemed to be unsuccessful due to the strict definition and recognition criteria, like in IAS 38.

Scandinavia has a long tradition of attempts of composing IC statements (Guthrie & Petty, 2000; Johansson, 2002). In the late 1980s, a group of Swedish practitioners "The Konrad Group" was elaborating about the invisible parts of the company that did not show up on the balance sheet. The Konrad Assets Theory divided the intangible parts of a company into three different categories, individual competence, internal structure and external structure utilising a set of 38 key indicators, ranging from financial performance indicators to new human resource measures (Konrad, 1988). The first corporate IC statement was issued by the Swedish insurance company Skandia in 1995 (Skandia, 1996), which became a prominent example among practitioners and researchers. However, after Skandia integrated their IC information into the traditional annual report the amount and content about IC shrank and blurred (Rimmel, 2003).

A different approach to IC reporting was taken in Denmark. Instead of corporations' attempting to create IC statements individually, leading to largely incomparable reports, the Danish Agency for Trade and Industry organised a IC reporting project in collaboration with researchers and Danish companies. The first Danish guideline was published in 2001 (DATI, 2001). In a sequel project 80 Danish companies participated in producing IC statements, which resulted in a revised guideline based on the experiences of the participating companies (Mouritsen *et al.*, 2003).

Various studies of investors' and analysts' demand for information indicate a substantial difference between the amount of information of this type found in companies' annual reports and the type of information demanded by the market (e.g. Eccles *et al.*, 2001, Eccles & Mavrinac, 1995). In cooperation with the Institute of Chartered Accountants of Scotland (ICAS), Beattie (1999) studied the ability of financial reporting to satisfy users' demands. The results illustrated that although non-financial information still has lower priority than traditional financial information; users consider disclosure regarding risk factor and quality of management to be insufficient.

Theoretically, additional relevant, non-financial information is expected to lower the cost of equity capital (cf. Verrecchia, 1983, 2001) because increased disclosure lowers investors' uncertainty about future prospects of the company and facilitates a more precise valuation of

the company (Botosan, 1997). Related to this argument, the disclosure of information on intellectual capital is expected to reduce information asymmetry and to enhance stock market liquidity and increase demand for companies´ securities (e.g. Diamond & Verecchia, 1991). Both Botosan (1997) and Richard and Welker (2001) confirm this in that they conclude that the quantity and quality of financial disclosure is negatively related to cost of equity capital for companies.

The IPO prospectus has by Beattie (1999) as well as Cumby and Conrad (2001) been suggested as a 'role model' for future reporting because companies are typically more open and future-oriented in their IPO reporting. It has also been claimed by Daily *et al.* (2003) that IPO prospectuses are likely to be especially accurate because companies are liable for any misleading or inaccurate information. Although the same could be said about other reporting media including the annual report it can be observed that the prospectus usually contains more information about future expectations regarding market developments and earnings, strategic direction and intent, management and board composition, etc., compared to the annual report from the same firm. This is at least the case for a number of Scandinavian prospectuses that have been examined by Bukh *et al.* (2005). However, there are likely to be substantial differences in national legislation and traditions with respect to disclosure in IPO prospectuses. In a recent study of disclosure in interim report of Greek firms by admission of securities to Athens Stock Exchanges, Mavridis (2002) noted for instance that annual reports, as they are used in other countries, are not very common among Greek medium-sized firms.

At the time of admission for listing on the stock exchange, the company publishes its IPO prospectus in order to market the share to investors. An admission to listing on the stock exchange offers a unique opportunity to study the amount and type of voluntary information considered for disclosure to the capital market. Thus, Mather *et al.* (2000) argue that management has an incentive to present the company in the best possible light in order to maximise the proceeds of the share issue (see also Aharony *et al.*, 1993). Although this could lead to earnings management, managers of companies involved in taking a company public have incentives to present the underlying information in the most favorable light possible (Mather *et al.*, 2000). Thus, the IPO prospectus provides insight into which types of information are selected by a company and its advisors for presenting the company in relation to investors and analysts.

Admission for listing on the stock exchange requires the company to report about its achievements, skills and growth potential in a reliable and sober manner, in order to demonstrate to investors that investing in the company will most likely generate a competitive return. This effort to attract investors is centred on the IPO prospectus, which clarifies the company's financial capability, performance, operation, skills, and the resources through which it intends to prove continued growth and increased shareholder wealth. With regard to this aspect, Ang and Brau (2002) show that the greater company transparency before the initial issue decreases the flotation costs of the IPO. Additionally, Schrand and Verrecchia (2004) find that greater disclosure frequency in the period prior to the IPO is associated with less underpricing.

The annual report has not only investors as its readers as it also conveys information to employees, potential employees, customers, the press and other stakeholders. Compared to that the IPO prospectus have a more limited group of readers than annual reports, and some differences in extent of disclosure can be expected. Compared to annual reports, prospectuses can be expected to provide additional disclosure of the company's long-term strategy, a specification of leading non-financial indicators relevant in assessing the effectiveness of the strategy implementation, comprehensive disclosure on company risks, and a discussion of the relation between leading indicators and future profits (Cumby & Conrad 2001).

Propositions concerning disclosure practices

A substantial body of research conducted from an information-economics perspective has concentrated on studying why companies disclose more information than is required by regulation. In relation to IPO prospectuses, Jenkinson and Ljungquist (2001) provide a comprehensive review of the literature. In general, proxies for ex ante uncertainty such as, underwriter reputation (Megginson & Weiss, 1991) as well as disclosure of earnings forecasts in IPO prospectuses (Clarkson & Merkley, 1994) have been shown to reduce underpricing. Most underpricing models (cf. Jenkinson & Ljungquist, 2001) predict that reducing ex ante uncertainty, for example by improved disclosure, and reduces underpricing. Thus, by increasing voluntary disclosure, the ex ante uncertainty surrounding an issue is reduced and thus the firm's need for underpricing also lessens.

In this paper, we study the extent of voluntary disclosure in Japanese IPO prospectuses and investigate whether this can be explained by four control variables – industry differences,

managerial ownership before the IPO, company size and company age. The first factor, *industry differences*, has previously been used to explain differences in disclosure in annual reports by Adrem (1999) and Cooke (1989) because there are differences in industry disclosure norms (cf. Gibbins *et al.*, 1990). As intellectual capital is regarded as being especially important in high-tech industries, it is anticipated that IT and biotechnology companies will disclose more information than traditional manufacturing and commercial companies. Further, since the market-to-book values of IT and biotechnology companies are generally higher, the disclosure of measures that lie outside the traditional accounting realm is likely to be relatively more important. Despite these results, not all studies conclude that industry type makes a difference. Robb, Single and Zarzeski (2001), for instance, only find minimal industry effects, a result confirmed by and Ström (2004) in a sample of Swedish IPO prospectuses.

Turning to a corporate governance perspective, the second factor, *managerial ownership before the IPO*, may influence companies' disclosure practices and thus the extent of disclosure in the IPO prospectus. Mather *et al.* (2000) argue that at the time of admission to the stock exchange, company management has an incentive to present the company in the best possible light in order to maximize the proceeds of the share issue (see also Aharony *et al.* 1993). The existence of some degree of managerial ownership in the company thus becomes a mechanism for ensuring management–shareholder alignment of interests (Demirag *et al.*, 2000, p. 348; Sudarsanam 2000). Ruland *et al.* (1990) noted that the tendency to disclose managers' forecasts is greater for companies whose officers and directors hold a high percentage of shares.

According to O'Sullivan (2000, p. 409), we can expect less disclosure from management if there is significant managerial ownership. In accordance with this line of argument, directors of the board who themselves do not own a substantial portion of the company can be expected to encourage more intensive auditing and disclosure because they are more likely to perceive themselves as fulfilling a monitoring role. Similarly, Hossain, Tan and Adams (1994), in a study of listed Malaysian companies, conclude that the amount of voluntary disclosure varies with ownership structure.

The third variable tested in the study, *company size*, has often been related to the amount of voluntary disclosure. Empirical studies date back to the 1950s, where, for example, Anton (1954) concluded that one-third of large American and Canadian companies regularly present

results to stockholders while the corresponding figures for small companies are one out of twenty. Robb, Single and Zarzeski (2001), for instance, find that larger firms provide higher levels of both forward-looking and historical non-financial disclosures in their annual reports than other firms. Among the explanations are that larger companies are more likely to have a wider ownership base, and that the costs of providing information are more prohibitive for small companies. The latter problem tends to grow with increased disclosure.

However, another factor to be considered is that larger companies, when compared to smaller ones, seem less risky to investors and have better access to resources. Small companies thus have greater incentives to reduce uncertainty by disclosure. This argument presumes that a small company - all other things being equal – should disclose more information and more details on competitors than is the case for a large company. These implications have been supported in studies by, for example, Ahmed and Courtis (1999) and Adrem (1999). Despite this, not all studies conclude that the size of the company is a significant factor in explaining voluntary publication of information. For instance, Wallace (1988) and Stanga (1976) who conclude that size is not a significant factor in explaining differences in companies' reporting between Nigeria and the USA.

Company age has often been seen as a proxy for risk in the sense that the more established companies are less risky. From this perspective, the extent of a company's disclosure is expected to be related to how many years it has been in business. For example, Kim & Ritter (1999, p. 430) provide evidence that non-financial information is of greater importance in the valuation of younger companies because forecast earnings work better for assessing younger companies than historical earnings do (cf. Klein, 1996; Amir & Lev, 1996). Furthermore, Jaggi (1997, p. 314) demonstrates that the number of years the company has been in business influences the accuracy of the forecasts disclosed in IPO prospectuses. These results indicate that there might be a negative relationship between the age of the company and the extent of its disclosure.

From the prior empirical research outlined above, the four hypotheses below are developed. As none of the literature reviewed above relates directly to disclosures in connection with IPO's, and because there are varying competing explanations the hypotheses are stated in the null form:

H1: *Industry differences*. There is no association with respect to disclosure of information on intellectual capital between companies in high-tech industries (IT and biotechnology) and traditional manufacturing and commercial companies

H2: *Managerial ownership*. There is no association between the amount of disclosure on intellectual capital and the existence of managerial ownership before the IPO

H3: *Company size.* There is no association between the amount of disclosure on intellectual capital and the size of the company.

H4: *Company age.* There is no association between the amount of disclosure on intellectual capital and the age of the firm

These factors have been raised and studied in the disclosure literature and can contribute with insights with respect to understanding the mechanisms of disclosure in connection with an IPO. While H1 might be explained by industry norms and institutionalized disclosure practices and furthermore that there are significant differences in competitive aspects across industry groups, the three latter control variables (H2, H3, H4) primarily concern the minimization of risk from the investors perspective. Pre-IPO managerial ownership is an important factor, because it indicates to potential investors whether the people who know the most about the future prospects of the company, namely its present management team, considers the company a good investment. Age and size are proxies for the chance of the company going bankrupt, i.e. age concerns the history of the company and size relates to whether it has critical mass to survive a fierce competitive environment over time.

Methodology

In the empirical part of this paper, a disclosure index is used to quantify the amount of information regarding intellectual capital included in the IPO prospectuses. There is an extensive amount of accounting literature relating to the use of disclosure scoreboards to measure the amount of information that is contained in corporate reports.

Although current research showed considerable variations in the extent and measurement of disclosed items, they commonly share the interest in examining the relevance and usefulness of issued information for investors (Giner Inchausti, 1997). Many researchers have made attempts to provide a framework for disclosure literature (Street & Bryant, 2000; Wiedman, 2000; Adrem, 1999; Cooke, 1989). These most frequently used frameworks approach existing disclosure literature by dividing disclosure information into the categories mandatory disclosure studies (Wallace *et al.*, 1994), voluntary disclosure studies (Adrem, 1999; Hossain *et al.*, 1994; Gray *et al.*, 1995; Guthrie & Petty 2000) and disclosure studies that consider both mandatory and voluntary disclosure items (Inchausti, 1997; Beattie *et al.*, 2002a).

One area that disclosure scoreboard studies normally not discuss is the fact that the nature of volume measurements is limited to the amount of information. Consequently, the use of a disclosure scoreboard does not allow making a statement about why corporations disclose information or how users think of disclosed information (Rimmel, 2004).

One study singled out by many researchers as the beginning of disclosure scoreboards for measuring disclosure was a study carried out by Cerf (1961), focusing the disclosure index of 31 items on the information needs of financial analysts. Rimmel's (2003) chronological review showed considerable large variation in the number of items included from Barret's (1976) 17 item disclosure index to Cooke's (1989) 224 items disclosure scoreboard. Further, many prior disclosure studies are built on earlier disclosure scoreboards. For example Adrem's (1999) disclosure scoreboard is based on Meek, Roberts and Gray's (1995) disclosure scoreboard applying the same structure and items.

Following the common path of disclosure index tradition, this study is a replication of the disclosure scoreboard applied in the recent disclosure study of information on intellectual capital in Danish IPO Prospectuses by Bukh *et al.* (2006).

The particular research design was chosen for our study because the disclosure index approach represents a proxy for the quality of disclosure of intellectual capital in IPO prospectuses. When applying such an approach, it is, however, important to consider the reliability of the results and the objectivity of the study (Unerman, 2000). In the present study, these criteria are handled through a thorough literature review, clear instructions in the coding process and verifying the coding through separate coding by multiple researchers. It can be

argued that the amount of disclosure might not be an exact indicator of disclosure quality (Beattie *et al.* 2004a, p. 210). However, as we are concerned with extent of disclosure, we find the disclosure index method to fulfil our requirements satisfactorily.

The disclosure index

There are no widely accepted theoretical guidelines for selecting items; therefore, the successful use of the disclosure index methodology depends on critical and cautious selection of items (Marston & Shrives 1991). As the focus of this article is voluntary information, the choice of items was based on a thorough inspection of the literature on corporate disclosure (cf. Eccles & Mavrinac, 1995; AICPA, 1994; Beattie *et al.*, 2002b; Beattie & Pratt, 2002a) and intellectual capital reporting (Guthrie & Petty 2000; DATI, 2001; Sveiby 2000). Regarding intellectual capital statements, the experiences and results of the major Danish project concerning intellectual capital statements (DATI 2001; DMSTI 2003) were a major source of insight.

In our study of the extent of voluntary disclosure of non-accounting information – e.g. information on knowledge-based resources, strategy and processes – in Japanese IPO prospectuses, a disclosure index consisting of 78 items was applied. Table 1 depicts the division of these items into 6 different categories and the number of items in them. All the items in the disclosure index are listed in Appendix 1.

Disclosure Index (78 items)	Employees	(27 items)
	Customers	(14 items)
	IT	(5 items)
	Processes	(8 items)
	Research & Development	(9 items)
	Strategic Statements	(15 items)

Table 1: The disclosure index

The contents of each IPO prospectus were compared to the items on the disclosure scoreboard and coded as 1 or 0, depending upon whether the IPO prospectus contained or did not contain the voluntary disclosure. Accordingly, the extent of disclosure was quantified as the percentage of recorded information items found in the prospectus. In other words, the IPO

prospectus is given one point if a given index item is found in the prospectus and no points if the given item is not found in the prospectus. This can be seen in the following formula, which was used to calculate the index score of each IPO prospectus:

$$\text{Score} = \left(\sum_{i=1}^{m} d_i / \text{M}\right) \times 100\%,$$

where d_i expresses item_i with the value found in the IPO prospectus in question otherwise 0. M expresses the maximum of information disclosed in the IPO, which could be 78 items.

The analysis of the disclosure scoreboard for this study is additive and unweighted following the path of the studies conducted by Adrem (1999); Meek, Roberts and Gray (1995) and Cooke (1989). All three studies referred to Spero's (1979) empirical findings that weighting of information is not relevant for several reasons. The most important one is to decrease subjectivity, which would be the case if applying special weights for different items, as the user's preferences are unknown. Hence, either a company discloses a voluntary item in its IPO prospectus or not, which shows that the number of items measures the amount of disclosure. No ranking list for the importance of different items is applied nor is the number of words about an item used. This procedure is corroborated by the criticisms discussed in the study by Hackston and Milne (1996).

Data

The data consists of a sample of IPO prospectuses from stock exchange listings at the Tokyo Stock Exchange. The 120 Japanese IPO prospectuses were obtained from EOL online systems. Our data does not include prospectuses disclosed in connection with capital increases.

The average disclosure of all the indicators included in our disclosure index is 13.3%, varying from NEC electronics (Japanese electronics company , IPO in 2003) prospectus, which discloses 34.6% of the proposed voluntary information items, to Toshin Denki (Japanese wholesale firm, IPO in 2003), which discloses 2.6% of the proposed voluntary information items.

Of the overall categories of the disclosure index, 'strategic statements' is the information category where most information is disclosed, averaging 18% across the Japanese sample (see

Appendix 1 for all sub-totals and disclosure percentages). Table 2 below classifies the IPO prospectuses by industry.

	Pharmaceutical and Research	IT and Technology	Trade and Service	Production	Total # IPOs
Japan	1	28	64	27	120

Table 2: Number of prospectuses classified by type of business

Descriptive statistics for the three continuous variables 'age', 'size', and 'managerial ownership before the IPO' are shown in Table 3. All the data for the analyses were contained in the prospectuses.

Variables		Mean	Std. deviation	Min.	Max.	Variance
Disclosure (number of items)	Japan	9,83	4,68	1	27	21,94
Size (# employees)	Japan	413,05	1.357,62	10	13.084	1.843.133
Age (years)	Japan	18,97	14,72	0,20	58,00	216,809
Managerial ownership prior to the IPO (%)	Japan	35,38	25,17	0	86,00	6,33

Table 3: Descriptive statistics

The Japanese IPO data was specifically tested for age regarding above and below 20, 15 and 10 years, which are shown in Table 4.

Age	Number	Average DI	F	p value
above 20	46	11.4	3.16	0.08
below 20	74	13.4		
above 15	65	10.9	11.96	0.01
below 15	55	14.6		
above 10	82	11.2	15.08	0.00
below 10	38	15.6		

Table 4: Age test for Japanese companies

Results

In Table 5, the average disclosure per prospectus has been calculated as described above and divided into the 6 different categories depicted in Table 1.

	Employees	Customers	IT	Processes	R&D	Strategic statements	Total*
Max. items	(27)	(14)	(5)	(8)	(9)	(15)	(78)
Japan	3.12	1.92	0.46	0.34	1.55	2.44	9.83

Table 5: Average number of items per prospectus (which is calculated as described above and divided into the 6 different categories depicted in Table 1)

	Employees	Customers	IT	Processes	R&D	Strategic Statements	Total	Disclosure %
IT and technology (n=30)	3.6	2.4	1.0	0.4	2.3	2.7	**12.4**	**15.9**
Pharmaceutical and Research (n=1)	4	5	0	0	6	6	**21**	**26.9**
Production (n=28)	1.9	2.0	0.4	0.3	3	2.7	**10.3**	**13.2**
Trade & Service (n=64)	3.5	1.7	0.3	0.3	0.5	2.2	**8.6**	**11.1**

Table 6: Average amount of disclosure by industry and category, Japan

As indicated from Table 6, there is a difference in the level of information between the different industry categories. The numbers of observations in some industry categories are rather small, but the difference with respect to disclosure between so-called traditional sectors, i.e. manufacturing, commercial and service companies, and high-tech sectors, i.e. IT, technology, pharmaceutical and biological engineering is statistically significant. These differences are consistent with the studies by Bukh et al. (2005), Cooke (1989, 1991) and Meek *et al.* (1995) who also concluded that the ratio of voluntary disclosure varies across industries. Since the number of Japanese IPO prospectuses is limited it was decided to aggregate the initial four industries into two main sectors, the high-tech comprising and low-tech sectors for the remainder of the analysis.

Analysis of company characteristics influencing disclosure

An analysis of variance (ANOVA) was used to test, controlling for technological type of the company (high-tech/low-tech), if the extent of managerial ownership before the IPO,

company age and company size influenced disclosure. In order to conduct the ANOVA analysis, we divided the data on the independent variables into discrete groups in order to determine whether there is an effect on disclosure as the presumed dependent variable.

As an explanation of high-tech and low-tech companies, the extent of 'managerial ownership before the IPO' was classified according the existence of such managerial ownership in the company at the time of IPO or not. This variable was thus measured as either 'no pre-IPO managerial ownership' or 'pre-IPO managerial ownership' in the cases where this was present. The variable 'company age' was measured in years and operationalised by distinguishing between young companies and old companies where enterprises aged less than 20 years were considered as young companies. Lastly, 'company size' was treated by dividing the data into small companies – of less than 250 employees – and large companies – of 250 employees or more.

H1: Industry differences

The independent variable 'technology type' had a significant influence on the extent of the disclosure. Totally, High-tech companies (n=53) disclosed significantly more information (mean score=18.11, disclosure level 18.11/78) than low-tech companies (n=135) (mean score=10.16, disclosure level=10.16/78)($F=62.421$, $p<0.01$). This contradicts Verrechia's (1983) findings were companies are expected to disclose more information when the cost-of-capital is low, which we discuss further in our concluding remarks.

Nonetheless, the significance of the "technology type" variable is not surprising considering the industrial categories from the previous section. An array of research has been conducted on value relevance of non-financial information for valuating knowledge-intensive companies (Mavrinac & Boyle, 1996; Mavrinac & Seisfeld, 1997). Sakakibara *et al.* (2005) asked 260 Japanese analysts, including financial analysts, fund managers, equity strategists, economists and venture capitalists, regarding the importance for Japanese analysts' in having access to non-financial information when valuating knowledge-intense companies compared to traditional companies. Sakakibara *et al.* (2005) found that Japanese analysts demanded significantly more IC information for estimating the value of knowledge-intensive companies compared to traditional companies.

H2: Managerial ownership

The independent variable 'managerial ownership' indicated that managerial ownership prior to the IPO did not have a significant effect on Japanese companies' disclosure. Japanese companies where management had an ownership share in the company at the time of listing on the stock exchange did therefore not disclose more information concerning intellectual capital. Japanese companies where managerial ownership was above 50% (n=54) disclosed insignificantly more information (mean score=12.44, disclosure level 12.44/78) than other companies (n=134) (mean score=12.38, disclosure level=12.38/78) ($F=1.132$, $p<0.289$). However, if we change threshold of managerial ownership from 50% to 40%, above 40% managerial ownership company (n=76) disclosed insignificantly more information (mean score=12.41, disclosure level 12.41/78) than other companies (n=111) (mean score=12.40, disclosure level=12.40/78) ($F=3.382$, $p<0.068$). If we change threshold of managerial ownership from 40% to 10%, above 10% managerial ownership company (n=66) disclosed insignificantly more information (mean score=12.45, disclosure level 12.45/78) than other companies (n=122) (mean score=12.30, disclosure level=12.30/78) ($F=8.804$, $p<0.003$), as well.

The results from the Japanese companies are contradicting to previous studies by Demirag *et al.* (2000) and O'Sullivan (2000). In a similar study, Bukh *et al.* (2005) discussed the reason for the influence of Pre-IPO managerial ownership on disclosure being that managers might have a greater incentive to market their companies, and to increase their personal profit as a result of a lowered cost of capital. However, Japanese managers seemingly do not have a greater incentive to disclose more non-financial voluntary information about their companies in order to amplify profit from lower cost of capital from an IPO, which we discuss further in our concluding remarks.

H3: Company size

The independent variable 'company size' had no significant influence on the extent of the disclosure by Japanese companies. Companies whose employee are more than 250 (n=69) disclosed a little bit more, however insignificantly, information (mean score=13.84, disclosure level 13.84/78) than other companies (n=119) (mean score=11.56, disclosure level 11.56/78) ($F=0.260$, $p<0.611$). Hence, the results from our analysis are contrary to Ahmed and Courtis (1999) as well as Adrem (1999), since our findings cannot corroborate their results that small

companies should disclose more information and details compared to large companies. Moreover, our findings strongly support Wallace's (1988) and Stanga's (1976) conclusions that company size is not a significant factor explaining voluntary disclosure of information.

H4: Company age

The independent variable 'age' had a significant influence on the extent of disclosure for Japanese companies. Japanese companies whose age are above 20 years (n=73) disclosed insignificantly a little bit more information (mean score=12.68, disclosure level 12.68/78) than other companies (n=110) (mean score=12.35, disclosure level 12.35/78) (F=0.030, p<0.862).

Additional checks have been done for Japanese companies above and below 15 years and above and below 10 years. Our analysis also showed that 'age' had a significant influence on the extent of disclosure by Japanese companies at the check for above and below 15 years. A Japanese company whose age is below 15 years (n=55) disclosed more information (14.6%) than a Japanese company whose age is above 15 years (n=65) (10.9%) (F=11.96, p=0.01). In addition the check for above and below 10 years confirmed that 'age' had a significant influence on the extent of disclosure by Japanese companies. A Japanese company whose age is below 10 years (n=38) disclosed more information (15.6%) than a Japanese company whose age is above 10 years (n=82) (11.2%) (F=15.08, p=0.00). Hence, the findings for the Japanese companies confirmed Kim and Ritter's (1999) results that IC information is of greater importance when valuing younger companies, as our tests showed that the amount of disclosure is increasing the younger the age of the company from 13,4% (<20) to 14,6% (<15) to 15,6% (<10). Our analysis shows that the Japanese companies below 10 years of age have a 2,2% higher disclosure rate than Japanese companies below 20 years of age.

Concluding remarks

We set out to study the voluntary disclosure of information on intellectual capital in Japanese IPO prospectuses. This research question was found to be of great interest in the light of the recent initiatives regarding disclosure of intellectual capital in Japan. Initiatives which were commenced after the IPO prospectuses studied were disclosed. Thus we set out to gain insights on the perceptions of the Japanese financial community on intellectual capital

information. Japan is also an interesting country in which to study intellectual capital as the country for several decades has been renowned for its innovativeness both in relation to new technologies, but also in relation to process-engineering and efficiency. In the late 1980's Japan was at the forefront of business research into knowledge management, and therefore it is interesting to study if there have been any spill-over effects.

From the analyses we can derive conclusions from each of the four hypotheses. The first factor studied, namely 'industry differences' (H1), found that high-tech companies disclosed more information on intellectual capital than companies in industries were technology played a lesser role in value creation. In relation to previous studies, this was not surprising. However, Verrechia (1983) argues that companies are expected to disclose more information when the cost-of-capital is low, and this contradicts the fact that the low-tech companies disclose less, as stable business models and stable cash flows could be expected to induce certainty to investors and thus lower their cost-of-capital.

The second factor 'Managerial ownership' (H2) elaborated upon the association between the amount of IC disclosure and the existence of managerial ownership before the IPO. This hypothesis was found to be insignificant for Japanese companies studied. This might be attributable to the fact that all Japanese issuers now select 'book building'[2] when introducing IPO's. Book building includes a discussion about the IPO price from the underwriting security company with financial analysts and other parties. According to Kutsuna and Smith (2004), book building enables more accurate valuation than the auction-offering method from the capital market[3]. Therefore, the insignificance of 'managerial ownership', as well as 'company size' as discussed in the following, might be attributable to the book building method absorbing the effects of disclosing additional IC information.

The results for the third factor 'company size' (H3) showed that company size is not a significant factor explaining voluntary disclosure of information. Hence, our findings contribute to the varying findings from previous studies. While supporting Wallace's (1988) and Stanga's (1976) conclusions that size is not a significant factor for the amount of

[2] Under book building the underwriter sets a minimum and maximum price and seeks indications of interest, primarily from institutional investors. Institutional investors submit nonbinding price and quantity indications to the underwriter. The underwriter, in selecting the final offer price, can accept the quantity indications above the price and sells any remaining shares to the public (Kutsuna & Smith, pp. 1130-1140).

[3] Within one month, after its introduction in 1997, all issuers in Japan were selecting book building, though auctioning is still available as a choice (Kutsuna & Smith, p. 1130).

disclosure; our results are contrasting Ahmed and Courtis (1999) and Adrem (1999) findings, as small companies did not disclose more information and details compared to large companies.

The results for the Japanese companies indicated that the fourth factor 'company age' (H4), had a significant influence on the extent of disclosure for Japanese companies. Further testing of the Japanese companies regarding age showed a continuing trend, as Japanese companies below 10 years disclosed 2,2% more information about IC than Japanese companies below 20 years.

Thus industry and age were the two hypothesis this study could conclude to be significant. When comparing the overall disclosure levels with previous studies in Denmark, Italy and Sweden, the Japanese companies studied have relatively low levels of IC disclosure. Also, the two hypotheses that we have rejected have been significant in a number of studies. This leads us to the questions of culture and traditions in the Japanese financial community.

Future prospects on IC reporting in IPO's

In order to move closer to understanding the differences between Japanese voluntary disclosure practices and that of other western countries, further studies contemplating the differences in the general governance structure of companies, the disclosure culture (including secrecy and fears of losing competitiveness), the legal environment, and the fact that the Japanese stock market has underperformed international stock markets performance-wise for the last 15 years, are needed. Likewise, differences in the general size of the economy and companies and differences relating to the structure of the competitive environment, country disclosure norms will possibly differ because of different institutional and legal environments. Robb, Single and Zarzeski (2001) show country norms to affect voluntary disclosure practices. The authors also recognize the possibilities of applying case studies and further, perhaps more qualitative content analyses, to this agenda.

Our study indicates that companies and their advisors believe that non-financial information is important in the capital market's assessment of the company's value. Consequently, analysing the motives behind the disclosure of intellectual capital and about how this information will be assed by the capital market would make necessary to obtain deeper knowledge on how

analysts and investors work with information about intellectual capital. Holland (2004) as well as Rimmel's (2003) interview studies with analysts indicate that intellectual capital disclosures are considered by analysts when they evaluate companies.

Finally, a more detailed understanding of companies' motives for disclosure as well as analysts' and investors' need for information should make the link to the companies' cost of equity capital. Schrand & Verrecchia (2004) have demonstrated that greater disclosure frequency in the period prior to the IPO is associated with lower underpricing as well as some of the more traditional measures of a companies' cost of capital such as bid-ask spread and analyst forecast dispersion also will be lower. Moreover, Guo, Lev & Zhou (2004) provide evidence that the disclosure of information related to product development, patent protection and venture capital backing in biotech IPO prospectuses subsequently lowers bid-ask spread and share return volatility. Since we found contradicting results regarding cost of disclosure theory, which might be attributable to the absorbing effects of book building for additional IC information. Consequently, we suggest studying further the relationship between IPO pricing and the level of disclosure by applying pricing experiments to analyze the effects of book building and auctioning.

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Appendix 1: The Disclosure Index

% of companies making disclosure		% of companies making disclosure	
	JP		**JP**
Employees (27 items)	**11,7**	**IT (5 items)**	**10,6**
Staff breakdown by age	0,8	Description & reason for investments in IT	13,8
Staff breakdown by seniority	0,0	IT systems	22,0
Staff breakdown by gender	0,0	Software assets	10,6
Staff breakdown by nationality	0,0	Description of IT facilities	4,9
Staff breakdown by department	22,0	IT expenses	1,6
Staff breakdown by job function	8,9		
Staff breakdown by level of education	3,3	**Processes (8 items)**	**4,7**
Rate of staff turnover	1,6	Efforts related to the working environment,	0,0
Comments on changes in number of employees	8,1	Information and communication within the company	4,1
Staff health and safety	1,6	Working from home	0,0
Education and training expenses/number of employees	0,0	Internal sharing of knowledge and information	14,6
Staff interview	0,8	Measure of internal or external failures	0,0
Statements of policy on competence development	39,0	External sharing of knowledge and information	12,2
Description of competence development program and activities	14,6	Fringe benefits and company social programs	3,3
Education and training expenses	0,0	Environmental approvals and statements/policies	3,3
Absence	0,0		
Employee expenses/number of employees	67,5	**Research & Development (9 items)**	**17,6**
Recruitment policies	53,7	Statements of policy, strategy and/or objectives of R&D activities	47,2
HRM department, division or function	0,8	R&D expenses	35,0
Job rotation opportunities	1,6	R&D expenses/sales	2,4
Career opportunities	2,4	R&D invested in basic research	12,2
Remuneration and incentive systems	49,6	R&D invested in product design/development	20,3
Pensions	0,8	Future prospects regarding R&D	7,3
Insurance policies	2,4	Details of company patents	9,8
Statements of dependence on key personnel	33,3	Number of patents and licenses etc,	10,6
Revenues/employee	3,3	Patents pending	13,8
Value added/employee	0,8		
		Strategic statements (15 items)	**18,1**
Customers (14 items)	**14,2**	Description of new production technology	35,0
Number of customers	2,4	Statements of corporate quality performance	11,4
Sales breakdown by customer	24,4	Strategic alliances	40,7
Annual sales pr, segment or product	88,6	Objectives and reason for strategic alliances	26,0
Average customer size	7,3	Comments on the effects of the strategic alliances	9,8
Dependence on key customers	39,8	Description of the network of suppliers and distributors	74,8
Description of customer involvement	6,5	Statements of image and brand	23,6
Description of customer relations	17,1	Corporate culture statements	0,8
Education/training of customers	3,3	Best Practise	5,7
Customers/employees	0,8	Organisational structure	27,6
Value added pr, customer or segment	0,8	Utilisation of energy, raw materials and other input goods	0,8
Market share (%)	1,6	Investment in the environment	5,7
Relative market share	0,8	Description of community involvement	3,3
Market share, breakdown by country/segment/product	4,1	Information on corporate social responsibility and objective	4,9
Repurchase	0,8	Description of employee contracts/contractual issues	0,8

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