



Intellectual capital disclosures in Japanese IPO prospectuses

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Abstract

Purpose – The purpose of this paper is to give an indication of the quantity of intellectual capital information in Japanese initial public offering (IPO) prospectuses from all stock exchange listings on the Japan Stock Exchange from 2003.

Design/methodology/approach – The paper applied a disclosure index consisting of 78 items to quantify the amount of information regarding intellectual capital included in the IPO prospectuses of Japanese companies. An analysis of variance (ANOVA) was used to test, controlling for technological type of the company (high-tech/low-tech), and whether the extent of managerial ownership prior to the IPO, company age and company size influenced disclosure.

Findings – From the analyses conclusions are derived for four hypotheses. The hypotheses “industry differences” (*H1*), “managerial ownership” (*H2*) and “company size” (*H3*) were found not to be significant factors explaining voluntary disclosure of information. The fourth factor, “company age” (*H4*), did, however, have a significant influence on the extent of disclosure for Japanese companies. Further testing of the Japanese companies regarding age showed a continuing trend.

Originality/value – Although Japan has been strongly associated with the concept of the knowledge society, Japanese studies regarding intellectual capital have been very scarce. No studies, to the best of one’s knowledge, have examined the specific disclosure of intellectual capital information included in Japanese IPO prospectuses.

Keywords Disclosure, Intellectual capital, Share issues, Japan

Paper type Research paper

Introduction

For more than a decade, researchers, accounting bodies and professional users of corporate disclosures have stressed that traditional financial reporting lacks the ability to capture information on intellectual capital (e.g. Elliot, 1992; American Institute of Certified Public Accountants, 1994; Wallman, 1995, 1996, 1997; Beattie, 1999; Lev and Zarowin, 1999; Eustace, 2001; Financial Accounting Standards Board, 2001; Lev, 2001; Institute of Chartered Accountants in England and Wales, 2003; Gu and Lev, 2004). Over



the past decades, companies' disclosure of information has gained increased attention due to globalisation and the 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.

Although Japan throughout the 1980s and 1990s has been strongly associated with the concept of the knowledge society and state-of-the-art practices in knowledge management, studies concerning the importance of intellectual capital in relation to valuing Japanese companies have been scarce. As such, no studies, to the knowledge of the authors, have examined the specific disclosure of intellectual capital information included in Japanese IPO prospectuses. Koga and Rimmel's (2007) comprehensive review indicated that Japanese accounting and disclosure standards have been considerably revised since Japan's "financial big bang" in 1996. They showed that the progress of international harmonisation of Japanese accounting is now close to the point where no substantial differences exist between Japanese accounting standards and IFRSs. In 2004, the Ministry of Economy, Trade and Industry of Japan acknowledged the importance of intellectual assets by introducing the Guideline for Intellectual Property Information Disclosure (GIPID) as an extension of corporate reporting (Ministry of Economy, Trade and Industry, 2004). Studying the quantity of intellectual capital information that is disclosed by IPOs in Japan is therefore a first step in facilitating a better understanding of how cultural differences affect disclosure and analysis practices across distinctly different business environments and cultures in a global setting.

Admission for listing on a stock exchange requires the company to report its achievements, skills and growth potential in a reliable and considered 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 greater company transparency before the initial issue decreases the floatation 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 under-pricing.

During the past years there have been many Scandinavian examples of leading IC practice, 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 only a few Japanese examples are available (cf. Johanson *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 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 are

described. The findings are then 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, based on the empirical findings, the paper discusses future prospects for IC reporting from an international point of view.

Corporate reporting, communication and the IPO prospectus

A number of studies revealed a decline in informativeness in parts of the traditional financial statement information set. Lev and Zarowin (1999) as well as Francis and Schipper (1999) directly relate such a loss of informativeness of traditional financial statements to the growth of intangible assets playing a major role in the generation of corporate value. There is a corresponding body of research that indicates that capital market actors are continuously intrigued by information about intangibles (Holland and Johanson, 2003). Grasenick and Low (2004) stated that the disclosure of intangibles measurement also derives its importance from the fact that it is a driver of values that can be measured and evaluated by management.

The external communication of companies' intellectual capital can be differentiated into two generic approaches:

- (1) to integrate IC in an extended traditional balance sheet; or
- (2) 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, as in IAS 38.

Scandinavia has a long tradition of attempts at constructing IC statements (Guthrie and Petty, 2000; Rimmel, 2003; Bukh *et al.*, 2005). In the late 1980s, a group of Swedish practitioners, known as the Konrad Group, began to discuss 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 – i.e. 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 Group, 1988). The first corporate IC statement was issued by the Swedish insurance company Skandia in 1995, and it became a prominent example among practitioners and researchers. However, after Skandia integrated their IC information into the traditional annual report, the amount and content relating to IC shrank and blurred (Rimmel, 2003).

A different approach to IC reporting was taken in Denmark. Instead of allowing corporations to attempt to create IC statements individually, leading to largely non-comparable 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 (Danish Agency for Trade and Industry, 2001). In a subsequent 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' demands 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 and 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 a lower priority than traditional financial information, users consider disclosure regarding risk factors 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 the 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 and Verrecchia, 1991). Both Botosan (1997) and Richardson and Welker (2001) confirm this, concluding that the quantity and quality of financial disclosure is negatively related to cost of equity capital for companies.

The IPO prospectus has been suggested as a "role model" for future reporting by Beattie (1999) as well as by Cumby and Conrad (2001) 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 an 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 reports of Greek firms by admission of securities to Athens Stock Exchanges, Mavridis (2002) noted, for example, that annual reports, as they are used in other countries, are not very common among medium-sized Greek 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 favourable 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.

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 and Weiss, 1991) as well as disclosure of earnings forecasts in IPO prospectuses (Clarkson and Merkle, 1994) have been shown to reduce underpricing. 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:

- (1) industry differences;
- (2) managerial ownership before the IPO;
- (3) company size; and
- (4) 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. Sonnier, 2008; Gibbins *et al.*, 1990). The division of companies into industry sectors is most often done using the GICS classification standards. In the present paper the GICS classification scheme has been collapsed into four overall industry groups following the practices of other disclosure studies in the field (cf. Bukh *et al.*, 2005). 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 (Guo *et al.*, 2005). Despite these results, not all studies conclude that industry type makes a difference. Robb *et al.* (2001), for instance, only find minimal industry effects, a result confirmed by and Ström (2006) in a sample of Swedish IPO prospectuses.

Turning to a corporate governance perspective, the second factor, managerial ownership before the IPO, measured as the percentage of total stockholding 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 maximise the proceeds of the share issue (see also Aharoni *et al.*, 1993). The existence of some degree of managerial ownership in the company thus becomes a mechanism for ensuring alignment of management-shareholder interests (Cordazzo, 2007; Demirag *et al.*, 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), 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 *et al.* (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 in 20. Robb *et al.* (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 for this 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. Finally, there are several ways of measuring the size of the company. While many studies use the metrics balance sheet and market value, in this study we apply number of employees for the reason of comparability to the study by Bukh *et al.* (2005).

Company age has often been seen as a proxy for risk in the sense that 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 and Ritter (1999) 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 and Lev, 1996). Furthermore, Jaggi (1997) 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 IPOs, 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 of information on intellectual capital and the existence of managerial ownership before the IPO.
- H3.* Company size. There is no association between the amount of disclosure of information on intellectual capital and the size of the company.
- H4.* Company age. There is no association between the amount of disclosure of information on intellectual capital and the age of the firm.

These factors have been raised and studied in the disclosure literature and can contribute insights with respect to understanding the mechanisms of disclosure in connection with an IPO. While *H1* might be explained by industry norms and institutionalised 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 minimisation of risk from the investors perspective.

Methodology

In the empirical part of this paper, a disclosure index is used to quantify the amount of information regarding intellectual capital included in 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. Many researchers have made attempts to provide a framework for disclosure literature (Street and Bryant, 2000; Wiedman, 2000; Adrem, 1999; Cooke, 1989). These most frequently used frameworks approach existing disclosure literature by dividing disclosure information into the following categories:

- mandatory disclosure studies (Wallace *et al.*, 1994);
- voluntary disclosure studies (Adrem, 1999; Hossain *et al.*, 1994; Gray *et al.*, 1995; Guthrie and 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 do 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).

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.* (2005), which to a large extent has been applied in a series of other studies (cf. Cordazzo, 2007; Singh and Mitchell Van der Zahn, 2007). 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, however, it is 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.*, 2004). However, as we are concerned with extent of disclosure, we find the disclosure index method to fulfil our requirements satisfactorily.

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 and Shrivs, 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 and Mavrinac, 1995; American Institute of

Certified Public Accountants, 1994; Beattie *et al.*, 2002b; Beattie and Pratt, 2002) and intellectual capital reporting (Guthrie and Petty, 2000; Danish Agency for Trade and Industry, 2001; Sveiby, 1997). Regarding intellectual capital statements, the experiences and results of the major Danish project concerning intellectual capital statements (Danish Agency for Trade and Industry, 2001; Mouritsen *et al.*, 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 divided into six different categories was applied. All the items in the disclosure index are shown in Table I.

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:

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

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 *et al.* (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 reason 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 consist of all IPO prospectuses from stock exchange listings at the Tokyo Stock Exchange in 2003. The 120 Japanese IPO prospectuses analysed were obtained from EOL online systems. The data does not include prospectuses disclosed in connection with capital increases. In Table I the applied disclosure index is illustrated, along with the percentage of disclosure by the entire population for each subcategory and item. The average disclosure of all the indicators included in our disclosure index is 12.6 per cent, varying from NEC's (Japanese electronics company) prospectus, which discloses 34.6 per cent of the proposed voluntary information items, to Toshin Denki (Japanese wholesale firm), which discloses 2.6 per cent of the proposed voluntary information items. Of the overall categories of the disclosure index, "strategic

Items (total = 78)	Percentage of companies making disclosure
<i>Employees (27 items)</i>	11.7
Staff breakdown by age	0.8
Staff breakdown by seniority	0.0
Staff breakdown by gender	0.0
Staff breakdown by nationality	0.0
Staff breakdown by department	22.0
Staff breakdown by job function	8.9
Staff breakdown by level of education	3.3
Rate of staff turnover	1.6
Comments on changes in number of employees	8.1
Staff health and safety	1.6
Education and training expenses/number of employees	0.0
Staff interview	0.8
Statements of policy on competence development	39.0
Description of competence development program and activities	14.6
Education and training expenses	0.0
Absence	0.0
Employee expenses/number of employees	67.5
Recruitment policies	53.7
HRM department, division or function	0.8
Job rotation opportunities	1.6
Career opportunities	2.4
Remuneration and incentive systems	49.6
Pensions	0.8
Insurance policies	2.4
Statements of dependence on key personnel	33.3
Revenues/employee	3.3
Value added/employee	0.8
<i>Customers (14 items)</i>	14.2
Number of customers	2.4
Sales breakdown by customer	24.4
Annual sales per segment or product	88.6
Average customer size	7.3
Dependence on key customers	39.8
Description of customer involvement	6.5
Description of customer relations	17.1
Education/training of customers	3.3
Customers/employees	0.8
Value added per customer or segment	0.8
Market share (per cent)	1.6
Relative market share	0.8
Market share, breakdown by country/segment/product	4.1
Repurchase	0.8

Table I.
The disclosure index with corresponding disclosure percentages per item

(continued)

Items (total = 78)	Percentage of companies making disclosure
<i>IT</i> (five items)	10.6
Description and reason for investments in IT	13.8
IT systems	22.0
Software assets	10.6
Description of IT facilities	4.9
IT expenses	1.6
<i>Processes</i> (eight items)	4.7
Efforts related to the working environment	0.0
Information and communication within the company	4.1
Working from home	0.0
Internal sharing of knowledge and information	14.6
Measure of internal or external failures	0.0
External sharing of knowledge and information	12.2
Fringe benefits and company social programs	3.3
Environmental approvals and statements/policies	3.3
<i>Research and development</i> (nine items)	17.6
Statements of policy, strategy and/or objectives of:	
R&D activities	47.2
R&D expenses	35.0
R&D expenses/sales	2.4
R&D invested in basic research	12.2
R&D invested in product design/development	20.3
Future prospects regarding R&D	7.3
Details of company patents	9.8
Number of patents and licenses, etc.	10.6
Patents pending	13.8
<i>Strategic statements</i> (15 items)	18.1
Description of new production technology	35.0
Statements of corporate quality performance	11.4
Strategic alliances	40.7
Objectives and reason for strategic alliances	26.0
Comments on the effects of the strategic alliances	9.8
Description of the network of suppliers and distributors	74.8
Statements of image and brand	23.6
Corporate culture statements	0.8
Best practice	5.7
Organisational structure	27.6
Utilisation of energy, raw materials and other input goods	0.8
Investment in the environment	5.7
Description of community involvement	3.3
Information on corporate social responsibility and objective	4.9
Description of employee contracts/contractual issues	0.8

Table I.

statements” is the information category where most information is disclosed, averaging 18.1 per cent across the total sample, while disclosures relating to the intellectual capital value derived from key processes only totalled 4.7 per cent.

The 120 IPOs on the Tokyo Stock Exchange in 2003 were from various industries. For the sake of attaining a reasonable number of industry groups for the remainder of the analysis, and also to facilitate comparison to previous studies of this nature, the GICS classification scheme was reduced to four overall industry categories. In the analysis, these categories were treated as dummy variables. Table II classifies the number of IPO prospectuses available for analysis by industry category.

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

In Table IV, the average disclosure per prospectus has been calculated according to the industry group variables and the total population as described above and also according to the six overall disclosure categories depicted in Table I.

As indicated in Table IV, 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 for the remainder of the analysis to aggregate the initial four industries into two main sectors:

- (1) the high-tech sector, comprising IT and technology and pharmaceuticals and research; and
- (2) the low-tech sector, comprising production and trade and service.

Table II.
IPOs by industry

Industry	Number of IPOs
IT and technology	28
Pharmaceutical and research	1
Production	27
Trade and service	64
Total	120

Table III.
Descriptive statistics

Variables	Mean	SD	Minimum	Maximum	Variance
Disclosure (number of items)	9.83	4.68	1	27	21.94
Size (number of employees)	413.05	1,357.62	10	13,084	1,843,133
Age (years)	18.97	14.72	0.20	58.00	216.809
Managerial ownership prior to the IPO (per cent)	35.38	25.17	0	86.00	6.33

	Employees	Customers	IT	Processes	R&D	Strategic statements	Total	Disclosure percentage
Maximum items	27	14	5	8	9	15	78	
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 and service ($n = 64$)	3.5	1.7	0.3	0.3	0.5	2.2	8.6	11.1
Total	3.1	1.9	0.5	0.3	1.6	2.4	9.8	12.6

Table IV.
Average amount of
disclosure by industry
and category

Analysis of company characteristics influencing disclosure

An analysis of variance (ANOVA) was used to test whether the four null hypotheses identified above – i.e. controlling for technological type of the company (high-tech/low-tech), 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 disclosure practices, the extent of “managerial ownership before the IPO” was classified according the existence or otherwise of such managerial ownership in the company at the time of IPO. 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

In the analysis of variance in relation to industry differences we followed the methodology of Bukh *et al.* (2005). Here the IPOs are classified by “technology type” into high-tech and low-tech companies. The IT and technology and pharmaceutical and research groups were thus regarded as high-tech companies, while production and trade and service groups were regarded as low-tech companies. The independent variable “technology type” had a significant influence on the extent of the disclosure. In total, 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 where 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 evaluating knowledge-intensive companies (Mavrinac and Boyle, 1996; Mavrinac and Siesfeld, 1997). Sakakibara *et al.* (2005) asked 260 Japanese analysts, including financial analysts, fund managers, equity strategists, economists and venture capitalists, about the importance for Japanese analysts in having access to non-financial information when valuing knowledge-intensive 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 companies in more traditional industry groups such as manufacturing and energy 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 therefore did not disclose more information concerning intellectual capital. Japanese companies where managerial ownership was above 50 per cent ($n = 54$) 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 the threshold of managerial ownership from 50 per cent to 40 per cent, companies with managerial ownership greater than 40 per cent ($n = 76$) 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 per cent to 10 per cent, companies with managerial ownership greater than 10 per cent ($n = 66$) 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.

These results from Japanese companies contradict 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 that have more than 250 employees ($n = 69$) disclosed insignificantly a little bit more 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 Japanese IPO data were specifically tested for age regarding above and below 20, 15 and ten years, as shown in Table V.

Age	Number	Average DI	<i>F</i>	<i>p</i> -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 V.
Age test for Japanese
companies

The independent variable “age” had a significant influence on the extent of disclosure for Japanese companies. Japanese companies that have existed for more than 20 years ($n = 46$) disclosed less information (mean 11.4 per cent) than Japanese companies whose age is below 20 years ($n = 74$) (13.4 per cent) ($F = 3.16, p = 0.08$).

Additional checks have been done for Japanese companies above and below 15 years and above and below ten 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 per cent) than a Japanese company whose age is above 15 years ($n = 65$) (10.9 per cent) ($F = 11.96, p = 0.01$). In addition the check for above and below ten years confirmed that “age” had a significant influence on the extent of disclosure by Japanese companies. A Japanese company whose age is below ten years ($n = 38$) disclosed more information (15.6 per cent) than a Japanese company whose age is above ten years ($n = 82$) (11.2 per cent) ($F = 15.08, p = 0.00$). Hence, the findings for 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 increases the younger the age of the company, from 13.4 per cent (< 20 years) to 14.6 per cent (< 15 years) to 15.6 per cent (< 10 years). Our analysis shows that the Japanese companies below ten years of age have a 2.2 per cent 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. 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 1980s Japan was at the forefront of business research into knowledge management, and therefore it is interesting to study if there have been any spillover effects. Especially, as Japan’s Ministry of Economy, Trade and Industry introduced the GIPID, in 2004, the purpose of which was to increase the acknowledgement of intellectual assets through a voluntary extension of corporate reporting (Ministry of Economy, Trade and Industry, 2004). A review of the GIPID by Johanson *et al.* (2006) showed that the usability of the GIPID needs further improvements.

From the analyses we can derive conclusions for each of the four hypotheses. The first factor studied, namely “industry differences” (*HI*), found that high-tech companies disclosed more information on intellectual capital than companies in industries where technology plays 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 the Japanese companies studied. This might be attributable to the fact that all Japanese issuers now select “book building”[1] when introducing IPOs. Book building includes a discussion about the IPO price from the underwriting security company with financial analysts and other parties. According to Kutsuma and Smith (2004), book building enables more accurate valuation than the auction-offering method from the capital market[2]. Therefore, the insignificance of “managerial ownership”, as well as “company size” as discussed below, might be attributable to the book building method absorbing the effects of disclosing additional IC information. Another reason for these differences may pertain to the governance structure in Japan, which differs from the more market-based environments of the USA, the UK (Cooke and Sawa, 2002), and to some extent also the Nordic countries.

The results for the third factor, “company size” (*H3*), showed that company size is not a significant factor explaining the 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 disclosure, our results are in contrast to the findings of Ahmed and Curtis (1999) and Adrem (1999), 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 that were less than ten years old disclosed 2.2 per cent more information about IC than Japanese companies that were less than 20 years old.

Thus industry and age were the two hypotheses 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 IPOs

In order to move closer to understanding the differences between Japanese voluntary disclosure practices and those of other Western countries, further studies considering 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 under-performed compared to international stock markets for the last 15 years, are necessary. 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 *et al.* (2001) show country norms to affect voluntary disclosure practices. The authors also recognise the value of pursuing case studies and, further, perhaps more qualitative content analyses for this agenda.

Our study indicates that companies and their advisors believe that non-financial information is important in the capital market's assessment of a company's value. Consequently, analysing the motives behind the disclosure of intellectual capital and about how this information will be assessed by the capital market are necessary to obtain a deeper knowledge of how analysts and investors work with information about intellectual capital. The work of 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 and 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 companies' cost of capital such as bid-ask spread and analyst forecast dispersion also will be lower. Moreover, Guo *et al.* (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. Our own findings regarding cost of disclosure theory, which might be attributable to the absorbing effects of book building for additional IC information, suggest further exploration of the relationship between IPO pricing and the level of disclosure by applying pricing experiments to analyse the effects of book building and auctioning.

Notes

1. Under book building the underwriter sets a minimum and maximum price and seeks indications of interest, primarily from institutional investors. Institutional investors submit non-binding 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 and Smith, pp. 1130-40).
2. Within one month of its introduction in 1997, all issuers in Japan were selecting book building, though auctioning is still available as a choice (Kutsuna and Smith, p. 1130).

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