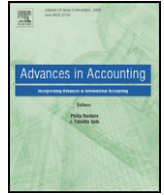




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Intellectual capital disclosure and the information gap: Evidence from China

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ABSTRACT

Our research examines the extent and quality of intellectual capital (IC) disclosure by Chinese companies, as well as investigates if the disclosure practices of Chinese companies meet the expectation of stakeholders. A mixed methods approach, combining both qualitative and quantitative elements, was used. An IC coding index was developed as an instrument to analyze annual reports of the top 100 Chinese A-share listed companies. The results indicate that the current level of IC disclosure was quite high in both extent and quality, and there was no significant information gap between the expectation of Chinese stakeholders and the actual disclosure practice of Chinese firms. This research provides further evidence as to the state of IC disclosure in the Chinese context, and makes some contributions to the existing literature.

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1. Introduction

The transition to a knowledge-based economy in recent decades has shifted the process of wealth creation (Chu, Chan, & Wu, 2011). Intellectual capital (IC), in the forms of research and development (R&D), information technology, corporate image, customer relations, business collaborations, employee competences, etc., has replaced physical and financial capital as the most important value driver for modern enterprises. As Davey, Schneider, and Davey (2009) indicate, "Intellectual capital is increasingly acknowledged as the most important asset for business performance and the foundation for market leadership and differentiation" (p. 401). Some researchers (e.g. Ghosh & Wu, 2007; Martín-de-Castro, Delgado-Verde, López-Sáez, & Navas-López, 2011) argue that IC is a key value creator for firms to achieve and maintain a competitive advantage. A prominent example for the importance of IC is the increasing gap between book value and market value of firms in the stock market, which is often referred to as 'hidden value' (Mouritsen, Larsen, & Bukh, 2001). Although we cannot attribute the expanding disparities entirely to IC, it is likely that IC is a major contributor to the 'hidden value'.

Corresponding to the current knowledge-based economy, increasing companies are realizing the importance of IC for future financial success and therefore invest heavily in IC. Moreover, many companies,

especially those publicly listed companies, have attempted to report their IC in corporate annual reports on a voluntary basis so as to highlight their superior quality to the market as well as attract potential investors (An, Davey, & Eggleton, 2011). IC disclosure is also considered to be an effective means for companies to reduce information asymmetry and to improve their relationship with various stakeholders (Yi & Davey, 2010).

This research examines the extent and quality of IC disclosure by Chinese companies, as well as investigates if the disclosure practice of Chinese companies meets the expectation of stakeholders. A mixed methods approach, combining both qualitative and quantitative elements, was used. An IC coding index was developed as an instrument to analyze annual reports of the top 100 Chinese A-share listed companies.⁴ The results indicate that the current level of IC disclosure was quite high in both extent and quality, and there was no significant information gap between the expectation of Chinese stakeholders and the actual disclosure performance of Chinese firms.

Our research contributes to the extant IC literature in the following ways. First, it contributes to limited research as to IC disclosure in the Chinese context.⁵ In particular, our research investigates if there is an information gap between the disclosure of IC information and the expectation of Chinese stakeholders. Second, our research offers some valuable

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⁴ A-share listed companies refer to those listed on the Chinese (mainland) stock exchanges (Shanghai or Shenzhen), available to domestic and qualified foreign institutional investors. As to the reasons for sample selection, please refer to "research method".

⁵ There are about three studies only regarding IC disclosure in the Chinese context in the international literature: Xiao (2008), Yi and Davey (2010), and Liao et al. (2013), please refer to the section of "literature review" for more details.

insights regarding motivations for Chinese companies to disclose or not to disclose their IC-related information, which should have implications for regulators and policy makers involved in the development of IC reporting guidelines applicable to the Chinese environment.

2. Theoretical perspectives

There have been some theories used to explain IC disclosure practices by companies in prior research, such as resource-based theory (e.g. *Abeysekera, 2010*), agency theory (e.g. *Li, Pike, & Haniffa, 2008*), stakeholder theory and legitimacy theory (e.g. *Guthrie, Petty, & Ricceri, 2006*), signaling theory (e.g. *Whiting & Miller, 2008*), and institutional theory (e.g. *Petty & Cuganesan, 2005*). However, *An et al. (2011, p. 572)* argue that “it is not sufficient for any of those theories taken separately to provide an adequate theoretical framework (for voluntary IC disclosure)”. Accordingly, they constructed a comprehensive theoretical framework through integrating four most frequently used theories in the area, comprising agency theory, stakeholder theory, signaling theory and legitimacy theory. The integrated framework includes three key premises for voluntary IC disclosure (*An et al., 2011, p. 579*):

1. To reduce information asymmetry between the management of an organization and various stakeholders in the society.
2. To discharge accountability to various stakeholders.
3. To signal organizational legitimacy and excellence (or superior quality) to the society.

The three premises are seen as motivations for companies to disclose their IC-related information voluntarily (*An et al., 2011*). Based upon the premises, we summarize a number of specific benefits favoring voluntary IC disclosure, which should significantly motivate companies to report their IC, as follows:

- Reduce insider trading (relating to premise 1).
- Improve the relationship with various stakeholder groups in society (relating to premise 1 and 2).
- Divert attention of the community from any prevailing negative influence of their activities (relating to premise 3).
- Improve corporate image (relating to premise 3).
- Attract potential investors and customers (relating to premise 3).
- Attract and retain talented employees (relating to premise 3).
- Lower capital costs (relating to premise 3).
- Decrease the volatility of stocks (relating to premise 3).
- Create an understanding of the products and services amongst various stakeholders (relating to premise 3).

Despite the benefits for voluntary IC disclosure, there are also some costs which would impair organizations' willingness to disclose their IC voluntarily. The costs generally include direct costs for preparing and disseminating IC reports, and indirect (or proprietary) costs, such as competition costs, political costs, potential litigation costs and auditing costs. It is easy to appreciate the direct costs since the preparation and dissemination of IC reports would necessarily incur costs for organizations (e.g. hiring specific IC staff). Proprietary costs often refer to the costs embedded in the consequences of certain corporate behavior rather than directly linked to it (*Verrecchia, 1983*). The particular proprietary costs relating to voluntary IC disclosure are described as follows.

- Competition costs. While an organization discloses IC information to the public, the information with a strategic significance (e.g. R&D) might be used or imitated by its competitors for intelligence purposes (*Vergauwen & Alem, 2005*). This would incur competition costs for the organization.
- Political costs. According to *Deegan and Samkin (2009)*, political costs refer to the costs that particular groups external to the organization

(e.g., governments and trade unions) may be able to impose on the organization, such as the costs associated with increased taxes, increased wage claims, etc. The voluntary disclosure of IC by an organization might attract unwanted attention from governmental/supervisory agencies or trade unions. This may generate political costs to the organization.

- Potential litigation costs. It is required by accounting standards and rules all over the world that accounting information disclosures should be reliable and consistent. Nevertheless most IC attributes, which cannot be recognized in the balance sheet under the conventional accounting framework, represent a future potential for value creation (*Guthrie & Petty, 2000; Yi & Davey, 2010*). The voluntary disclosure of such information may not be considered reliable and consistent by investors, and consequently incur unnecessary legal litigations (*Vergauwen & Alem, 2005*).
- Auditing costs. Auditors in accounting firms are generally required to follow accounting regulations and auditing standards strictly whilst they audit financial statements. This reflects auditing conservatism. The purpose of auditing conservatism is to protect auditors' reputation and avoid the potential risk of litigation (*Clarkson, Ferguson, & Hall, 2003*). Yet most IC-related information is not mandatorily required by accounting standards and regulations. In accordance with the principle of auditing conservatism, auditors would not like to audit this type of information for their own interests (*Vergauwen & Alem, 2005*). As a consequence, voluntary IC disclosures might lead to unexpected costs for organizations to deal with the auditing issues.

In this research, we applied the above theoretical perspectives (both drivers and costs), having regard to the Chinese environment, to interpret voluntary IC disclosure practices by Chinese companies (in the “discussion and conclusions” section).

3. Literature review

3.1. IC disclosure in developing countries

The research and published literature regarding IC disclosure have grown in recent years. However, most previous studies focus on developed countries. Examples include *Guthrie and Petty (2000, Australia)*, *Brennan (2001, Ireland)*, *Bozzolan et al. (2003, Italy)*, *Abdalmohammadi (2005, US)*, *Vergauwen and Alem (2005, Netherlands, France and Germany)*, *Striukova et al. (2008, UK)*, *Whiting and Woodcock (2011, Australia)*, *Li et al. (2012, UK)*, *De Silva et al. (2014, New Zealand)*, *Farooq and Nielsen (2014, Denmark)*, etc. Amongst the studies, *Guthrie and Petty (2000)* is a pioneer study for this type of research. In the study, the researchers developed an IC coding framework to analyse annual reports of the 20 largest Australian companies for the 1998 period, so as to determine the level of IC reporting in Australia. Most subsequent studies applied or modified their framework to investigate the state of IC disclosure in various national contexts. These studies often obtained similar findings that there was no established framework for IC reporting, and the level of IC disclosure was generally low, with most IC items presented in narrative rather than monetary or numerical terms.

On the other hand, a relatively small number of studies have been concerned with developing countries (e.g. *Abeysekera & Guthrie, 2005; April, Bosma, & Deglon, 2003; Ensslin & De Carvalho, 2007; Goh & Lim, 2004; Haji & Ghazali, 2012; Kumar, 2013; Yi & Davey, 2010*). In the following, the relevant literature is reviewed.

April et al. (2003), *Goh and Lim (2004)*, and *Abeysekera and Guthrie (2005)* are three earlier studies as to voluntary IC disclosure in a developing country context. *April et al. (2003)* investigated IC measurement, management and reporting in the South African mining industry. Content analysis of corporate annual reports and interviews were used as the research methods. The researchers found that mining firms reported less IC information than other firms and they favoured

external capital reporting.⁶ The findings also indicate that mining firms acknowledged the value of IC, but failed to measure, manage and report it appropriately and systematically.

Wagciengo and Belal (2012), drawing on April et al. (2003), is the latest study concerned with the South African context. This research surveyed the extent and nature of IC reporting by top 20 South African firms from 2002 to 2006, using the content analysis method. The results show that there was an upward trend for IC reporting in South Africa, and human capital was the most frequently reported category.

Goh and Lim (2004) examined the IC reporting practices of 20 top listed companies in Malaysia through content analysis of annual reports. The findings reveal that the disclosure of IC-related information by Malaysian companies was highly qualitative, and the most popular reporting category was external capital. Further, Haji and Ghazali (2012) investigated the trend of IC reporting by Malaysian listed companies from 2008 to 2010. The results indicate that there was a general upward trend and a significant overall increase for IC reporting over the investigated period. The researchers also observed that there were significant differences between reporting categories, and external capital was the most highly reported category.

Abeysekera and Guthrie (2005) is another seminal study regarding IC reporting in a developing country context. The research surveyed the status of IC reporting in Sri Lanka through content analysis of annual reports of 30 top listed firms on the Colombo Stock Exchange over a two-year period (1998/1999 and 1999/2000). The results show that there was an increasing trend over the surveyed period, and the most frequently reported IC category was external capital. The researchers applied the political economy of accounting theory to explain the findings.

There are also some other studies investigating the state of IC disclosure in a particular developing country, such as Ensslin and De Carvalho (2007, Brazil), Kamath (2008, India), Abeysekera (2010, Kenya), Hidalgo et al. (2011, Mexico), Singh and Kansal (2011, India), Abhayawansa and Azim (2014, Bangladesh). As for China, the largest developing country and one of the most dynamic economies in the world, there have been three studies in the area: Xiao (2008), Yi and Davey (2010), and Liao, Low, and Davey (2013). Xiao (2008) explored the extent of IC disclosure by the top 50 listed firms on the Shanghai Stock Exchange using the 2007 (annual report) dataset. The results demonstrate that Chinese firms did not attach significant importance for IC reporting. The most frequently reported IC element in the study was human capital, while the least reported was external capital. However, excluding the mandatory IC disclosures, internal capital became the most reported IC category, whereas human capital was the least reported.

Yi and Davey (2010) extended the previous research and surveyed both the extent and quality of voluntary IC disclosure by 49 dual-listed A and H share companies in 2006 using an IC disclosure index. The findings indicate that the level of IC disclosure by Chinese mainland companies was low although there was a clear awareness of the importance of IC reporting. Inconsistent with Xiao (2008), the most reported IC category was external capital while the least reported was human capital.

Further, Liao et al. (2013), drawing on Yi and Davey (2010), examined and compared the extent and quality of IC disclosure in the Chinese and English language versions of 50 dual-listed Chinese firms. The results show that, the Chinese version annual reports disclose greater

internal capital information than the English versions while the English versions report more external capital information. The results also indicate that there is a strong correlation between industry type, company size and the level of IC disclosure.

It is acknowledged that the three studies provide some insights with respect to IC reporting in the Chinese context. Yet the drawbacks should not be ignored, such as relatively small sample size, and a single qualitative research method (content analysis). To address the weaknesses, Our research used a mixed methods approach to examine the extent and quality of IC disclosure by 100 top listed A-share companies in 2009 (from various perspectives), and explored if there was an information gap between the expectation of Chinese stakeholders and the actual disclosure practice of Chinese firms.

4. Research methodology

A mixed methods approach, combining both qualitative and quantitative elements, was employed in our research. Specifically, the research evolved in two stages. To begin, a comprehensive IC coding index was developed primarily through consultation and a questionnaire survey with a panel of Chinese IC experts. Then, the developed index was applied as an instrument to analyse the annual reports of sample companies in order to determine the level of voluntary IC disclosure in Chinese companies. In the following, the detailed process is described.

4.1. First stage: development of an IC coding index

The IC coding index was developed in three steps. Both qualitative and quantitative methods were involved during the process. Initially, a draft list of IC items under three categories (internal, external and human capital) was identified on the basis of previous studies (e.g. Brennan, 2001; Guthrie & Petty, 2000; Striukova et al., 2008; Wong & Gardner, 2005; Yi & Davey, 2010). To validate the potential IC framework applicable to the Chinese environment, a consultation process with an advisory panel comprising 20 Chinese experts on IC from 6 annual report user/stakeholder groups was carried out.⁷ A consensus was achieved after some negotiations, which resulted in a final list of 20 IC items (comprising six items for internal capital, nine items for external capital and five items for human capital, refer to Table 1 for the items and their descriptions).

Furthermore, a questionnaire survey was designed to identify the weighting of the IC items in that a five-point rating scale (1–5) was used to gather opinions from the panel of IC experts on the importance of the disclosure items.⁸ The responses (or ratings) from the panelists for each IC item were summed and then divided by twenty (the total number of panelists) to obtain a mean rating which represents the weighting (or disclosure importance) for the item (refer to Table 2 for the weighting of each IC item). It is contended that the use of a panel with twenty panelists from six annual report user groups avoids the bias imposed by only one user group (usually financial analysts) in prior research (Hooks, Coy, & Davey, 2002).

The final step for the development of the index involved developing criteria to assess the quality of IC disclosures. Based upon previous research employing disclosure indices (e.g. Firer & Williams, 2005;

⁶ External (or relational) capital is one category of IC, representing resources embedded in the relationships external to an organization, such as customer satisfaction, distribution channels, business collaborations, etc. Internal (or structural) and human capital are other two categories of IC. Internal capital represents resources embedded in an organization's structure, processes, procedures, routines, systems and culture while human capital refers to human resources within an organization. This three-element framework was widely used in empirical research in the area.

⁷ Comprising two chief financial officers (CFOs) from sample companies, five accountants participating in preparing annual reports from sample companies, four accounting scholars from universities or research agencies, three CPAs from big N accounting firms, four financial analyst from investment companies or banks, and two officials working in governmental supervisory agencies for corporate reporting.

⁸ 1: unimportant to disclose; 2: of little importance to disclose; 3: moderately important to disclose; 4: very important to disclose; 5: extremely important to disclose We used a weighted disclosure index in this research since we believed that different IC items would have varied disclosure importance, and it was problematic to treat all disclosure items equally that were obviously not of equal importance.

Table 1
Weightings of the disclosure items.

Items	Descriptions	Weightings
<i>1. Internal capital</i>		
1.1 Research and development	Information regarding research and development activities and outcomes within a company (e.g. new products or new services)	4.0
1.2 Intellectual property	Comprising patents, copyrights and trademarks, etc.	4.5
1.3 Management philosophy/corporate culture	A blend of values, spirits, belief, attitudes, experiences, taboos, rituals etc. existing in a firm	3.0
1.4 Management processes	All the processes related to the management of a company (e.g. quality management)	3.2
1.5 Information/networking systems	Details on the development, application and impact of information or networking systems	3.0
1.6 Financial/investors relations	Relationships between a company and its finance providers or investors	3.8
<i>2. External capital</i>		
2.1 Brands/reputation	Details of brands or reputation building	4.3
2.2 Suppliers	Information (or indicators) relating to suppliers	3.3
2.3 Customers	Information (or indicators) relating to customers	3.8
2.4 Customer satisfaction/loyalty	Information (or indicators) regarding customer satisfaction or loyalty	4.0
2.5 Marketing	Details of marketing channels, strategies and outcomes	4.2
2.6 Distribution channels	Information regarding how a firm's services and products reach its customers	3.4
2.7 Business collaborations	Business collaborations involving the company (e.g. joint-ventures, mergers or acquisitions)	4.1
2.8 Research collaborations	Involving the company	3.3
2.9 Licensing agreements/franchising agreements/favorable contracts	Held by a firm	4.1
<i>3. Human capital</i>		
3.1 Employees	Information (or indicators) relating to employees	3.7
3.2 Qualifications	Academic and vocational qualifications held by employees	3.5
3.3 Education/training	Education or training programs or opportunities provided by a firm	3.0
3.4 Work-related knowledge/competences	Obtained from the job or training by employees	3.6
3.5 Entrepreneurial spirit	Encompassing innovativeness, proactive and reactive abilities, changeability, and risk taking	3.5

Note: Weighting = sum of the rating (1–5) assigned by each panelist / 20 (total number of panelists).

Schneider & Samkin, 2008; Yi & Davey, 2010), the criteria with a five-point scale (0–4) were established as follows (please also refer to Table 2 for some examples regarding the scale):

- 4: if the disclosure item is clearly defined in monetary or numeric terms and clear narrative statements are made.
- 3: if the item is disclosed clearly as to its influence on the company or its policies.
- 2: if the item is disclosed with limited references or value comments while disclosing other topics and themes.
- 1: if the company indicates that the disclosure item is unimportant for its financial well-being and results.
- 0: if the item is not disclosed at all in the annual report.

The extent of IC disclosure represents the number of items reported by sample companies for each IC category and the overall IC; quality refers to the weighted and normalized disclosure score (0–1) achieved by sample companies for each IC category and the overall IC (see Table 3 to see how to calculate the score). We employ China Coal Energy Co. Ltd. as an example to demonstrate how to calculate the weighted scores.

4.2. Second stage: content analysis of corporate annual reports

In the second stage, the developed index was used as an instrument for content analysis of annual reports of sample companies. The detailed procedures for this stage are described as follows.

4.3. Sample selection and data source

In this research, 100 top listed A-share Chinese firms in terms of market capitalization were selected as the sample. These companies are usually the largest companies in China.⁹ It is expected that they should report more IC information than those relatively small companies because of the advantage for resources and visibility. Moreover, the sample companies cover a wide range of industrial sectors, allowing

us to gain information regarding IC disclosure practices across various industries. The year 2009 annual reports of sample companies were primary data sources for this research, since the annual report has been widely used by listed companies as a primary communication medium to highlight their excellence and discharge accountability to various stakeholder groups (Guthrie & Petty, 2000; Schneider & Samkin, 2008; Yi & Davey, 2010).

4.4. Content analysis

Content analysis of corporate annual reports was the research method for this stage. According to Krippendorff (2004, p. 18), content analysis is “a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use.” It is often viewed as an interpretative (or qualitative) approach which seeks to interpret the meaning of texts through quantifying and analyzing published information systematically, objectively and reliably (Ahuvia, 2001; Guthrie, Petty, Yongvanich, & Ricceri, 2004; Steenkamp & Northcott, 2007). The method has been widely applied in information disclosure research, in particular in the area of social and environmental disclosures (e.g. Clarkson, Li, Richardson, & Vasvari, 2008; De Villiers & Van Staden, 2006; Islam & Deegan, 2010; Unerman, 2000). In recent years, many IC researchers have used the method to evaluate the level of IC disclosure in a variety of contexts (e.g. April et al., 2003; Beattie & Thomson, 2007; Guthrie & Petty, 2000; Yi & Davey, 2010). This research, drawing on the previous studies, employed the method to gauge the extent and quality of IC disclosures by Chinese firms.

4.5. Coding of annual reports

There are various counts of data used for content analysis, such as words, sentences, paragraphs or portion of pages. In this research, sentences were chosen as the unit of coding since “individual words have little meaning without a context and paragraphs or portions of pages might consist of several distinct meanings/threads that are difficult to code” (Yi & Davey, 2010, p. 335). Moreover, Vandemaele, Vergauwen, and Smits (2005) argue that sentences as the recording unit are “more reliable than any other unit of analysis” (p. 420). During

⁹ At the beginning of September, 2010.

Table 2
Examples of various points obtained by sample companies.

Points	Examples
4	China South Locomotive & Rolling Stock Co., Ltd. obtained the maximum score of 4 for the disclosure of its 'research & development' investment and outcomes: <i>In 2009, the Company invested RMB2.62 billion in technical R&D, launched 404 new R&D projects and continued with 304 existing R&D projects. During the year, the Company won one first-class prize of the State Scientific and Technological Progress Award, as well as two special prizes, one first-class prize, three second-class prizes and two third-class prizes of the science and Technology Award of China Railway Society (China South Locomotive & Rolling Stock Co., Ltd., 2009, p. 67).</i>
3	China Minsheng Banking Co., Ltd. disclosed one of its brilliant 'marketing' programs in "Management Discussion and Analysis", obtaining a score of 3: <i>The Company launched My Dream 2009 program in 2009...The program received the Cross-media Marketing and Sales Integrated Award, Best Innovative Marketing Award and Competitive Marketing Excellence Award from China Advertising Association, China Times and China Business Journal respectively (China Minsheng Banking Co., Ltd., 2009, p. 40).</i>
2	Air China Ltd., achieving a score of 2, obscurely reported its 'customer satisfaction' with limited references whilst addressing its outcome in brand building in "Chairman's Statement" <i>For the continuous improvement of our brand recognition, the company won 17 influential brand-name-related awards, among which the company was awarded the "Best Airline of the Year" by the Asia Pacific Aviation Centre and won the "Passengers Satisfaction Award" for the third consecutive year in travelers' satisfaction survey. (Air China Ltd., 2006, 2006, p.7).</i>

the coding process, only voluntary IC disclosures were coded.¹⁰ In addition, if an IC item was reported more than once by a sample company, the quality score (1–4) was assigned based upon the aggregate disclosures.

Once the coding of annual reports was completed, the collected data were quantified and analyzed from various perspectives. The results are presented in the following section.

5. Results

5.1. IC disclosure by IC items and information gap

5.1.1. Internal capital

Table 4 shows the disclosure frequency and quality (score) of internal capital items. This table contains the following information:

Frequency is the number of sample firms receiving a particular quality score (0–4);

Disclosure Score represents a normalized quality measure (0–1) for the reporting of each IC item, e.g. 'research & development' is calculated as follows: $0.87 = (3 \times 0 + 0 \times 1 + 8 \times 2 + 24 \times 3 + 65 \times 4) / 100 \times 4$.

Disclosure Importance is derived from the weighting of each item (refer to Table 1), representing the expectation of the stakeholder panel on the disclosure of the item. Based upon the rating scale (1–5), the disclosure importance of each IC item was determined as follows: If the weighting falls in 1.00–1.49: unimportant to disclose; 1.50–2.49: of little importance to disclose; 2.50–3.49: moderately important to disclose; 3.50–4.49: very important to disclose; and 4.50–5.00: extremely important to disclose.

It is apparent that "management processes" was the most frequently reported IC item, being reported by 99 out of 100 firms, with the highest disclosure score of 0.98 in this category (as well as the overall IC). In addition, "management philosophy/corporate culture", "research & development", and "financial/investors relations" were also highly reported, with a disclosure score of 0.91, 0.87 and 0.86 respectively. "Intellectual property" was the least reported item in the category, being reported by 57 firms with a score of 0.50. Overall, this category was disclosed well with all the items achieving a score above 0.50.

We also investigated if there was an information gap between the actual disclosure practice of each IC item and the expectation of the expert panel, which represents a wide range of Chinese stakeholders, for the disclosure of the item.¹¹ As is shown in the table that the disclosure

of such items as "research and development", "information/networking systems" and "financial/investors relations" were very consistent with the stakeholders' expectations. However the item "intellectual property", considered to be extremely important by the stakeholder panel, was under-disclosed with a score of 0.50, revealing an information gap for the disclosure of this item. Two other items, "management philosophy/corporate culture" and "management processes", both achieved a very high disclosure score (above 0.90), but the stakeholder panel deemed them to be moderately important. Therefore, the disclosure of these two items exceeded the expectation of stakeholders.

5.1.2. External capital

Table 5 below shows the disclosure performance of external capital items in both extent (frequency) and quality. "Customers" was the most frequently reported item in this category, being reported by all

Table 3
Disclosure practice of China Coal Energy Co. Ltd. (2009).

Items	Actual score	Maximum score	Weighting
<i>1. Internal capital</i>			
1.1 Research and development	4	4	4.0
1.2 Intellectual property	4	4	4.5
1.3 Management philosophy/corporate culture	3	3	3.0
1.4 Management processes	3	3	3.2
1.5 Information/networking systems	3	4	3.0
1.6 Financial/investors relations	4	4	3.8
<i>2. External capital</i>			
2.1 Brands/reputation	3	4	4.3
2.2 Suppliers	3	4	3.3
2.3 Customers	4	4	3.8
2.4 Customer satisfaction/loyalty	3	4	4.0
2.5 Marketing	4	4	4.2
2.6 Distribution channels	3	4	3.4
2.7 Business collaborations	4	4	4.1
2.8 Research collaborations	3	4	3.3
2.9 Licensing agreements/franchising agreements/favorable contracts	3	4	4.1
<i>3. Human capital</i>			
3.1 Employees	4	4	3.7
3.2 Qualifications	4	4	3.5
3.3 Education/training	4	4	3.0
3.4 Work-related knowledge/competences	3	3	3.6
3.5 Entrepreneurial spirit	3	3	3.5

• Weighted score for internal capital = $(4 \times 4.0 + 4 \times 4.5 + 3 \times 3 + 3 \times 3.2 + 3 \times 3 + 4 \times 3.8) / (4 \times 4.0 + 4 \times 4.5 + 3 \times 3 + 3 \times 3.2 + 4 \times 3 + 4 \times 3.8) = 76.8 / 79.8 = 0.96$.

• Weighted score for external capital = $(3 \times 4.3 + 3 \times 3.3 + 4 \times 3.8 + 3 \times 4.0 + 4 \times 4.2 + 3 \times 3.4 + 4 \times 4.1 + 3 \times 3.3 + 3 \times 4.1) / (4 \times 4.3 + 4 \times 3.3 + 4 \times 3.8 + 4 \times 4.0 + 4 \times 4.2 + 4 \times 3.4 + 4 \times 4.1 + 3 \times 3.3 + 4 \times 4.1) = 115.6 / 138 = 0.84$.

• Weighted score for human capital = $(4 \times 3.7 + 4 \times 3.5 + 4 \times 3 + 3 \times 3.6) / (4 \times 3.7 + 4 \times 3.5 + 4 \times 3 + 3 \times 3.6) = 62.1 / 62.1 = 1$.

• Final score (weighted score for overall IC) = $(76.8 + 115.6 + 62.1) / (79.8 + 138 + 62.1) = 0.91$.

¹⁰ Namely those not mandatorily required by accounting standards and rules.

¹¹ To judge if the disclosure performance of an IC item was consistent with, above or below the expectation of the stakeholder panel, we compared the disclosure score (representing the disclosure performance) with the disclosure importance of the item (representing the expectation of the panel). Generally, if a disclosure score ≤ 0.45 : (corresponding to) unimportant or of little importance to disclose; 0.45–0.65: moderately important to disclose; 0.66–0.90: very important; ≥ 0.90 : extremely important, would be considered consistent. Otherwise, an information gap would occur (over-disclosed or under-disclosed).

Table 4
Disclosure performance of internal capital items.

1. Internal capital	Frequency (n = 100)					Disclosure score (0–1)	Disclosure importance
	0	1	2	3	4		
1.1 Research & development	3	0	8	24	65	0.87	Very important
1.2 Intellectual property	43	0	11	8	38	0.50	Extremely important
1.3 Management philosophy/corporate culture	4	0	14	82	n/a	0.91	Moderately important
1.4 Management processes	1	0	3	96	n/a	0.98	Moderately important
1.5 Information/networking systems	22	0	12	47	19	0.60	Moderately important
1.6 Financial/investors relations	1	0	15	12	72	0.86	Very important

the firms with a disclosure score of 0.96. In Addition, “business collaborations”, “suppliers” and “marketing” were also highly reported, achieving a disclosure score of 0.85, 0.79 and 0.79 respectively. “Research collaborations”, being reported by 35 firms out of 100 with a score of 0.24, was the least reported external capital item, as well as across all category items. “Customer satisfaction/loyalty” was another item obtaining a relatively low disclosure score in the category (under 0.50). Overall, 78% of external capital items obtain a disclosure score above 0.50.

We can also find from the table that the disclosure of such items as “brands/reputation”, “customers”, “marketing”, “distribution channels”, and “business collaborations” (representing 56% of total external capital items), deemed very important or moderately important (to disclose) by the stakeholder panel, were consistent with the expectation of stakeholders. The item “suppliers”, considered moderately important by the stakeholder panel, achieved a disclosure score of 0.79 that exceeds the expectation of stakeholders. The other three items (approximately 33%) were under-disclosed, indicating an information gap for their disclosure.

5.1.3. Human capital

Table 6 shows the disclosure performance of human capital items. “Employees” was the most frequently reported item in the category, being reported by all the firms with a disclosure score of 0.94. In addition, items such as “qualifications” and “entrepreneurial spirit” were also highly reported, achieving a disclosure score of 0.88 and 0.78 respectively. “Work-related knowledge/competences” was the least disclosed item, being reported by 63 firms (out of 100) with a disclosure score of 0.58. Overall this category was disclosed well with all the items obtaining a score over 0.50.

As for the information gap, all the human capital items except for “work-related knowledge/competences” (80% of the total) were consistent with the expectation of the stakeholder panel. This reconfirms the strong performance of this category. ‘Work-related knowledge/competences’ was the only under-disclosed item, obtaining a score of 0.58, which was, however, considered very important by stakeholders.

6. Summary of results

The overall IC disclosure by Chinese firms in 2009 was quite good with 90% (18 out of 20) of the items achieving a score above 0.50 (refer to Table 7). The three most highly reported items were “management processes”, “customers” and “employees” while the three least reported items were “research collaborations”, “customer satisfaction/loyalty” and “intellectual property”. With respect to the relationship between the actual IC disclosure practices by Chinese firms and the expectation of stakeholders, the disclosure of 60% of the total IC items (12 out of 20) was consistent with the expectation of the stakeholders. However, five items (25%), comprising “research collaborations”, “customer satisfaction/loyalty”, “intellectual property”, “licensing/franchising agreements/favourable contracts” and “work-related knowledge/competences”, were under-disclosed, which need to be improved in future practice.

6.1. IC disclosure by firms

6.1.1. Extent of disclosure

Table 8 shows the summary results as to the disclosure performance of sample companies for each IC category and the overall IC in both extent and quality.¹²

For internal capital disclosure, the average number of items disclosed per company was 5.26 out of a maximum possible of 6. There were 41 firms which disclosed all the internal capital items. The lowest number of reported items was 3, which was obtained by two firms: Sanan Optoelectronics Co., Ltd., and Shan Xi Guo Yang New Energy Co., Ltd. Overall, the disclosure frequency of internal capital by Chinese firms was quite high.

In regard to external capital disclosure, the average number of items reported per firm was 7.2 out of a possible 9. Thirteen companies reported all the external capital items. There were also 36 firms which reported 8 items out of 9. The lowest number of disclosure items for this category was 4, achieved by four companies. Compared with internal capital, the disclosure frequency of external capital was relatively lower.

As to human capital disclosure, the average number of items per company was 4.24 out of a possible 5. Sixty-one percent of the total firms (61) reported all the human capital items while nine percent (9 firms) reported only two items (the lowest number). Overall, the disclosure frequency of this category was high.

For the overall IC disclosure, the average number of items reported per firm was 16.71 out of a maximum possible of 20. Eight firms disclosed all the IC items and eighteen firms omitted only one item. The lowest number of items for overall IC disclosure was ten, obtained by one company only, namely Shanxi Xishan Coal and Electricity Power Co., Ltd.

6.1.2. Quality of disclosure

With respect to the quality of IC disclosures (refer to Table 8), human capital was the highest scoring category, achieving an average disclosure score of 0.77. The highest disclosure score for this category was 1.00 obtained by two firms: China Minsheng Banking Co., Ltd. and China Gezhouba Group Co., Ltd. There were 97 firms achieving a score over 0.50 for the disclosure of this category. The lowest scoring firm was Tangshan Jidong Cement Co., Ltd., with a disclosure score of 0.44.

The second highest scoring category was internal capital which achieved a mean disclosure score of 0.76, slightly lower than for human capital. The highest disclosure score for this category was 0.95 achieved by China CITIC Bank while the lowest disclosure score was 0.31 obtained by Shan Dong Dong-E-E-Jiao Co., Ltd. There were 86 firms obtaining a score above 0.50 for the disclosure of this category.

The lowest scoring IC category was external capital which obtained a mean disclosure score of 0.67. There were twenty companies achieving the highest disclosure score of 1 for this category. Eight-three percent of

¹² The detailed disclosure performance for each sample company can be obtained from the authors.

Table 5
Disclosure performance of external capital items.

2. External capital	Frequency (n = 100)					Disclosure score (0–1)	Disclosure importance
	0	1	2	3	4		
2.1 Brands/reputation	7	0	9	73	11	0.70	Very important
2.2 Suppliers	14	0	9	11	66	0.79	Moderately important
2.3 Customers	0	0	8	2	90	0.96	Very important
2.4 Customer satisfaction/loyalty	35	0	23	21	21	0.48	Very important
2.5 Marketing	3	0	14	45	38	0.79	Very important
2.6 Distribution channels	22	0	17	17	44	0.65	Moderately important
2.7 Business collaborations	4	0	16	14	66	0.85	Very important
2.8 Research collaborations	65	0	10	25	0	0.24	Moderately important
2.9 Licensing agreements/franchising agreements/favourable contracts	30	0	17	30	23	0.54	Very important

the total firms got a score above 0.50. The lowest disclosure score for this category was 0.35 obtained by six firms.

Overall, the average reporting score for the total IC across all the sample firms was 0.72. The highest score was 0.91 achieved by three firms: China CITIC Bank, Bank of China Ltd., and China Coal Energy Co., Ltd. There were 93 firms scoring over 0.50 for the overall IC disclosure. The lowest disclosure score was 0.39 obtained by Shan Dong Dong-E-E-Jiao Co., Ltd.

7. Discussion and conclusions

7.1. Current status of voluntary IC disclosure in China

In previous sections, the extent and quality of voluntary IC disclosure by Chinese companies were examined from various perspectives. On the basis of the results, we find that the current level of IC reporting in mainland China is quite high with an overall score of 0.72 (out of a possible maximum of 1.00) on total disclosures for all the firms in the sample. More than 90% of the firms scored above 0.50, and 75% of disclosure items were consistent with or exceeded the expectation of stakeholders. Furthermore, a number of firms attempted to report on some elements of IC systematically in some sections of their annual reports (e.g. “Sustainability Report” and “Human Resources Management”). In addition, some Chinese firms tended to use monetary or numerical terms to quantify some attributes of their IC, such as brand value and customer satisfaction/loyalty rate. All these results indicate that Chinese firms, at present, not only have a good understanding with regard to the real value of IC, but are progressing to measure and report their IC effectively.

However, it is acknowledged that there are some limitations as to Chinese companies' IC disclosure. First, no firms issued a stand-alone or complete IC report, which means that the attributes disclosed by any individual firm were haphazardly distributed in various sections of the annual report. Nevertheless, this should not be criticized because there is no established or generally-accepted framework for IC reporting currently in China. Moreover, quite a few reported items were still expressed in discursive rather than numerical or monetary terms, which indicate that Chinese firms still lack methods to measure some elements of IC. The weaknesses suggest that Chinese firms still need to improve their IC reporting practices in the future. Furthermore, developing a generally-accepted IC reporting framework applicable to the

Chinese environment will be an urgent research agenda for Chinese scholars and practitioners in order to solve the problems.

In summary, albeit there are still a number of limitations, an overall disclosure score of 0.72 is sufficient to suggest that Chinese firms already have a strong commitment in communicating their IC information to various stakeholders in society.

7.2. Possible motivations as to status

According to the integrated theoretical framework developed by An et al. (2011), there are often three factors motivating companies to disclose their IC on a voluntary basis: (1) to reduce information asymmetry between the management of a company and various stakeholders in society; (2) to discharge accountability to various stakeholders; and (3) to signal organizational legitimacy and excellence (or superior quality) to society. All these motivations should be applicable to the Chinese environment.

Firstly, since the reform of Chinese state-owned enterprises in the 1990s, many Chinese firms have moved from purely state-owned firms to joint-stock firms, with a multiple-shareholding structure including both state-owned and private shares. Moreover, a number of them have established a modern corporate governance system in that a typical principal-agent relationship between the management of the company and various stakeholder groups (e.g. government agencies, private investors, and the general public) now exists. Pursuant to the concept of information asymmetry, the stakeholders often lack information with regard to the operation, the development and the potential of the company, and therefore they require the disclosure of this type of information. It is not surprising, therefore, that Chinese firms report some important corporate information voluntarily, such as IC, in order to reduce information asymmetry and the related agency costs (e.g. insider trading), and further to improve the relationship with various stakeholders.

Secondly, a large number of Chinese firms, in particular those publicly-listed, are still state-controlled or have a large proportion of state-owned shares. As the Chinese government (namely the communist party) claims, all the properties of the state belong to the people of the state. This statement suggests that Chinese firms with state-owned shares should be accountable to the people (or the general public) of the country. Also, pursuant to the concept of accountability, firms need to discharge accountability to other stakeholder groups, such as

Table 6
Disclosure performance of human capital items.

3. Human capital	Frequency (n = 100)					Disclosure score (0–1)	Disclosure importance
	0	1	2	3	4		
3.1 Employees	0	0	0	26	74	0.94	Very important
3.2 Qualifications	0	0	1	48	51	0.88	Very important
3.3 Education/training	27	0	13	15	45	0.63	Moderately important
3.4. Work-related knowledge/competences	37	0	15	48	n/a	0.58	Very important
3.5 Entrepreneurial spirit	12	0	31	57	n/a	0.78	Very important

Table 7
Disclosure performance of all IC items (in descending order by disclosure score).

Items	Disclosure score (0–1)	Disclosure importance
1.4 Management processes	0.98	Moderately important
2.3 Customers	0.96	Very important
3.1 Employees	0.94	Very important
1.3 Management philosophy/corporate culture	0.91	Moderately important
3.2 Qualifications	0.88	Very important
1.1 Research & development	0.87	Very important
1.6 Financial/investors relations	0.86	Very important
2.7 Business collaborations	0.85	Very important
2.2 Suppliers	0.79	Moderately important
2.5 Marketing	0.79	Very important
3.5 Entrepreneurial spirit	0.78	Very important
2.1 Brands/reputation	0.70	Very important
2.6 Distribution channels	0.65	Moderately important
3.3 Education/training	0.63	Moderately important
1.5 Information/networking systems	0.60	Moderately important
3.4 Work-related knowledge/competences	0.58	Very important
2.9 Licensing/franchising agreements/favourable contracts	0.54	Very important
1.2 Intellectual property	0.50	Extremely important
2.4 Customers satisfaction/loyalty	0.48	Very important
2.8 Research collaborations	0.24	Moderately important

governmental agencies, private investors from domestic and international arenas, environmentalists, etc., so as to obtain support from them. Since the disclosure of IC is widely acknowledged as an effective means for firms to discharge accountability to various stakeholders, it is not unexpected that Chinese firms perform well with respect to voluntary IC disclosure.

Thirdly, since the Chinese government implemented the “reform” and “open-door” policy¹³ in 1978, the Chinese economy has undergone dramatic development over the past three decades. However, due to the lack of an awareness of sustainability, the rapid development of the economy has been done at great cost and destruction to the natural environment, which has resulted in many social and environmental problems (e.g. pollution and food safety). Chinese firms have been seriously criticized by both domestic and international environment-protection communities. More recently, numerous non-government organizations have been involved in environment-protection activities, and called for clean and sustainable development for the Chinese economy. Meanwhile, the Chinese government had enacted and implemented several laws and rules to curb those social and environmental problems, and begun to reform the mode of economic development with an emphasis on sustainability. In these circumstances, increasing numbers of companies have realized that the traditional means of conducting business operations cannot secure their status of legitimacy, and even threaten their survival. Hence, many companies have attempted to shift the means for value creation through developing intellectual capital. Simultaneously, to deflect negative attitudes (or impressions) from some stakeholder groups, and consequently to signal their legitimacy to society, Chinese firms are increasingly (voluntarily) disclosing their IC.

In addition, in recent years as China became more involved in the WTO (World Trade Organization), the Chinese stock market was booming with an increasing number of listed firms.¹⁴ The market also became more open to both domestic and foreign investors. In these circumstances, the competition between listed firms for attracting investment became more intensive. In order to obtain a favourable position in the market, the firms usually employ all means possible to draw attention to themselves. Owing to the significance of IC for the future success of

¹³ This policy was put forward by the Chinese leader Dong Xiaoping in 1978. The purpose of the policy is to reform the Chinese political and economic system and strengthen the connection with other countries.

¹⁴ China gained entry to the WTO in 2001.

Table 8
Summary of disclosure performance by firms (n = 100).

	Internal capital		External capital		Human capital		Overall IC	
	Extent	Quality	Extent	Quality	Extent	Quality	Extent	Quality
Mean	5.26	0.76	7.20	0.67	4.24	0.77	16.71	0.72
Highest	6	1.00	9	0.95	5	1.00	20	0.91
Lowest	3	0.44	4	0.31	2	0.35	10	0.39

a company, the voluntary disclosure of IC is often deemed to be an efficient way for the company to signal its excellence to the market. As a consequence, this could improve corporate image, attract potential investors and customers, and further lower capital costs and decrease volatility of stocks (Rodgers, 2007; Vergauwen & Alem, 2005). These possible benefits are also drivers for Chinese firms to be active in disclosing their IC.

On the other hand, we also observed that some firms were very reluctant to report on their IC or some elements of IC. These findings may be attributed to the following factors. Firstly, some Chinese companies may consider that the expected benefits of preparing and disseminating IC information would be out-weighed by the costs of doing so (the so-called direct costs), and therefore they may choose to not disclose this type of information. Secondly, some IC attributes, such as R&D, are of a strategic significance, and the disclosure of them may be quickly used or imitated by competitors for intelligence purposes (competition costs). This would impair the company's interests. Therefore, some firms may choose to not disclose sensitive IC information (Yi & Davey, 2010).

Thirdly, the voluntary disclosure of IC may attract unwanted attention from governmental or supervisory agencies, or trade unions, which could have negative consequences for the firm (political costs) (Williams, 2001). Hence some companies may not adequately disclose their IC due to perceived downside risks. Besides, potential litigation risks and auditing costs may also convince some companies to not disclose their IC. Fifth, some firms may consider the generation of IC to be an internal management issue and thus beyond the scope of the annual report (Guthrie, Petty, & Wells, 1999). Last, the dominant role of the conventional accounting framework and the lack of a generally-accepted IC reporting model may also discourage some companies from disclosing their IC voluntarily (Yi & Davey, 2010).

8. Limitations

Our research has some limitations. Firstly, albeit the sample size is larger as compared with the three previous (Chinese) studies (Liao et al., 2013; Xiao, 2008; Yi & Davey, 2010); it still focuses on the top listed companies, without including small and medium sized enterprises (SMEs). Hence our research may not fully reflect the true extent of IC disclosure amongst Chinese companies. Furthermore, our research only covers one year's annual reports, which fails to provide insights regarding the trend of IC disclosure by Chinese firms. Finally, we investigated the level of voluntary IC disclosure from various perspectives, but ignored the effects of some firm's characteristics on the disclosure (e.g. firm size, corporate performance, auditor type, ownership structure, and board independence).

9. Future research

In future research, a more representative sample, including large, medium and small sized companies, should be selected in order to show a truer picture of IC disclosure in China. This would facilitate a comparison of disclosure performance between different sized companies. Future research could also survey the trend of IC disclosure in China, for example, over a five-year period. In addition, future research could investigate the impact factors, such as firm size, corporate performance, ownership structure, and some corporate governance variables, have on IC disclosure. Finally, the research approach in this study could

be replicated in other jurisdictions, particularly those developing countries (e.g. Indonesia and Russia), and then a comparative study can be made between the countries.¹⁵

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¹⁵ There is minimal research regarding IC disclosure in these two large developing countries. For other large developing countries, such as India, Brazil and South Africa, there have been some studies in the area.