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Yi An

*University of Waikato*, ya13@waikato.ac.nz

Howard Davey

*University of Waikato*

Ian R. C. Eggleton

*University of Waikato*

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## **Abstract**

This paper examines the effects of industry type, firm size and corporate performance on intellectual capital (IC) disclosure among Chinese (mainland) companies. It was found that industry type did not have a significant influence on IC reporting practices of Chinese firms; the larger firms generally reported more IC information than the relatively smaller firms; and there was a positive relationship between corporate performance and IC disclosure. This paper contributes to fairly limited literature regarding the associations between the level of IC disclosure and a variety of relevant impact factors, in particular in the Chinese mainland context. In addition, the findings of this research provide some references for policy-makers while developing an IC reporting framework applicable to the Chinese environment.

## **Keywords**

Intellectual capital; Disclosure; Industry; Size; Performance



# The Effects of Industry Type, Company Size and Performance on Chinese Companies' IC Disclosure: A Research Note

Yi An<sup>1,2</sup> Howard Davey<sup>1</sup>, Ian R.C. Eggleton<sup>1</sup>

## Abstract

This paper examines the effects of industry type, firm size and corporate performance on intellectual capital (IC) disclosure among Chinese (mainland) companies. It was found that industry type did not have a significant influence on IC reporting practices of Chinese firms; the larger firms generally reported more IC information than the relatively smaller firms; and there was a positive relationship between corporate performance and IC disclosure. This paper contributes to fairly limited literature regarding the associations between the level of IC disclosure and a variety of relevant impact factors, in particular in the Chinese mainland context. In addition, the findings of this research provide some references for policy-makers while developing an IC reporting framework applicable to the Chinese environment.

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**JEL Classification:** G15

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<sup>1</sup> University of Waikato

<sup>2</sup> [ya13@waikato.ac.nz](mailto:ya13@waikato.ac.nz)

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## Introduction

In the present knowledge-based economy, intellectual capital (IC) has been seen as the key element for corporate success owing to its value-creating potential (Stewart 1997; Yi & Davey 2010). However the conventional accounting framework that focuses on tangible assets measurement and reporting fails to capture most IC attributes (e.g., information systems, reputation, customer satisfaction, distribution networks, and innovativeness), nor does this framework present IC attributes in a concise and meaningful format (Guthrie & Petty 2000; International Federation of Accounting (IFAC) 1998; Singh & Van der Zahn 2009). Firms are therefore encouraged to disclose their IC on a voluntary basis in annual reports for the purpose of providing more transparency and promoting greater understanding amongst various stakeholders (Financial Accounting Standards Board (FASB) 2001; Sonnier, Carson & Carson 2007).

Since the Chinese government implemented the policy of “reform” and “openness” in 1978, China has undergone high-speed economic growth over the past three decades. During this period knowledge has played a crucial role in the boom of the Chinese economy (Chen 2005). Science and technology are regarded as the primary means for productivity by the Chinese central government and to develop science and technology was identified as a fundamental state policy (Chinese Central Government 1992). Within this context numerous Chinese firms invested heavily in scientific and technological innovations which shifted many of them from labor intensive to knowledge-intensive companies. In recent years, many Chinese companies, especially those public-listed companies, have attempted to report their knowledge resources (namely intellectual capital) in annual reports in order to signal their excellence to the capital market and hence attract potential investors (Zhang 2008).

The research and published literature in regard to IC disclosure by companies are growing in recent years. These studies often investigate the status of IC disclosure in a particular country through a survey of top listed companies on the stock exchange (e.g. Abeysekera & Guthrie 2005; Goh & Lim 2004; Guthrie & Petty 2000), or examine the associations between IC disclosure and a variety of impact factors, such as board composition, size, profitability, etc., through some statistical techniques (e.g. Li, Pike & Hannifa 2008; Oliveira, Rodrigues & Craig 2006). In China, the largest developing country as well as one of the most dynamic economies in the world, there have been two studies (Xiao 2008; Yi & Davey 2010) investigating the status of IC disclosure, but no research surveying the impact factors on IC disclosure.

This paper, based on Yi and Davey (2010), examines the associations between IC disclosure by all 49 dual-listed A and H share Chinese mainland<sup>3</sup> companies and three most commonly used explanatory variables (in disclosure studies), namely industry type, firm size, and corporate performance. There are two contributions regarding this paper. Firstly it contributes to fairly limited literature with respect to the associations between the level of IC disclosure and a variety of relevant impact factors, in particular in the Chinese mainland context<sup>4</sup>. In addition, the findings of this research provide some references for policy-makers while developing an IC reporting framework applicable to the Chinese environment.

The remainder of this paper is structured as follows. The next section gives an introduction with regard to the background of Chinese stock markets. This is followed by a review of the definition of IC and prior literature regarding IC disclosure and discussion of the research approach of the current study. Examination of the relationships between industry

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<sup>3</sup> Not including Hong Kong, Macau and Taiwan

<sup>4</sup> In which the stock market is unique (refer to section 2).

type, firm size and corporate performance and IC disclosure follow respectively. The final section discusses the results and indicates limitations and future directions of the research.

### Background of Chinese Stock Markets

Formal stock markets in China were established in the early 1990s as the Shanghai Stock Exchange (SHSE) and the Shenzhen Stock Exchange (SZSE) were approved to operate by the Chinese government in November and December 1990 respectively. Since 1993, Chinese mainland companies have been permitted to be listed on the Hong Kong Stock Exchanges and Clear Limited (the full name of Hong Kong Stock Exchange). In general, Chinese (domestic) stock exchanges refer to the Shanghai and the Shenzhen Stock Exchange other than the Hong Kong Stock Exchange since Hong Kong is independent in economy albeit it has been a special administrative region of China since 1997. As a matter of fact, the Hong Kong Stock market is often defined as a developed market, whereas the Chinese stock market is regarded as an emerging market (Li 2007).

The Chinese stock market is unique in that the shareholding structure of listed firms is heterogeneous. A Chinese listed firm can issue various shares in the domestic market including state-owned shares, institutional shares, employee shares, tradable A-shares and B-shares. Only the last two types of shares can be traded publicly on the stock exchanges. However A-shares are primarily available to the domestic investors and some licensed foreign institutional investors. Also the Chinese listed firm can issue some foreign shares, such as H-shares, which are listed on the Hong Kong Stock exchange and principally available to foreign investors. Chinese firms are not allowed to be listed on both the Shanghai and Shenzhen stock exchanges simultaneously, but they can be dual-listed on either of the domestic exchanges (Shanghai or Shenzhen) and the Hong Kong Stock Exchange (the so-called dual-listed A and H share companies).

### Intellectual Capital

There is no general consensus regarding the definition of intellectual capital with academic researchers developing various definitions. A number of influential definitions proposed by scholars or visionary organisations are summarised in Table 1.

**Table 1**  
Definitions of intellectual capital

Authors	Intellectual capital .....
Stewart (1997)	...is defined as intellectual material - knowledge, information, intellectual property and experience - that could be used to create wealth for organizations.
Sveiby (1997)	...consists of the invisible assets of an organisation which include: internal structure, external structure, and employee competence.
Bueno-Campos (1998)	...is seen as basic competences of intangible character that could achieve and maintain competitive advantage for firms.
Union Fenosa (1999)	...is a set of intangible values that can enhance corporate capability for future value creation.
Sullivan (1999)	...is knowledge that can be converted into profits. It consists of two elements that are human capital and intellectual assets.
Sharma, Hui and Tan (2007)	...refers to the knowledge, skills and technologies applied to create a competitive edge for an organization.

Drawing on the definitions above, intellectual capital was defined in this study as knowledge assets that can create value for firms as well as achieve and sustain a competitive edge for them.

For the components of IC, a three-dimensional framework including internal, external and human capital is widely accepted by researchers in the area (e.g., Brennan 2001; Guthrie & Petty 2000; Oliveras et al. 2008; Shareef & Davey 2006; Yi & Davey 2010). This research uses this framework as a foundation for data analysis. The three dimensions are defined below:

- Internal capital refers to the knowledge embedded in the organisational structure, processes, procedures, routines, systems and culture.
- External capital refers to the knowledge embedded in the relationships external to the organisation, such as suppliers, customer, business partners, etc.
- Human capital refers to the individual's knowledge such as qualification, skills, values and experiences within an organisation.

## PRIOR LITERATURE

There is considerable published literature on IC disclosure in a variety of national contexts. However most of this focuses on developed countries (e.g. Brennan 2001; Bontis 2003; Guthrie & Petty 2000; Oliveras et al. 2008; Whiting & Miller 2008; Williams 2001) with approximately four studies (Abeysekera & Guthrie 2005; Goh & Lim 2004; Xiao 2008; Yi & Davey 2010) researching IC in developing countries.

Abeysekera and Guthrie (2005) investigated annual reporting trends of intellectual capital in Sri Lanka in the period 1998/1999 to 1999/2000 through content analysis of annual reports of the top 30 firms. The authors found that companies in Sri Lanka emphasised intellectual capital in their annual reports and had covered a wide range of IC attributes, but the reports lacked a framework and a consistent approach for IC disclosure. External capital was the most frequently reported category in the study and human capital, although deemed as the most important assets by firms, was the second most reported category.

The IC disclosure practices of the top 20 profit-making, public listed firms in Malaysia were examined by Goh and Lim (2004). Using the content analysis method they found that the incidence of voluntary IC disclosure was highly qualitative rather than quantitative. Again, external capital had the most disclosures, compared with internal capital and human capital.

In 2008, the extent of IC disclosure of the top 50 firms listed on the Shanghai Stock Exchange was surveyed (Xiao 2008). The results demonstrated that Chinese firms did not attach significant importance to reporting their IC. Inconsistent with the prior research, the most reported information in this study was human capital and the least disclosed element was external capital. Nevertheless, when the data excluded the mandatory IC information, internal capital became the most reported category and human capital was the least reported.

All the previous studies only examine the extent (or frequencies) of IC disclosure in a particular country through content analysis of corporate annual reports of top listed firms. Yi and Davey (2010) extended the previous research and investigated both the extent and quality of IC disclosure by 49 Chinese dual-listed A and H share firms in 2006 using a comprehensive disclosure index.

The current paper extends Yi and Davey's 2010 research and examines the effects of industry type, firm size and corporate performance on IC disclosure employing the same data set.

## Research Approach

The research examined all the dual-listed A and H share Chinese firms (49 in total) for two reasons. Firstly, these firms are open to both domestic and foreign investors. Most of them are large companies according to market capitalisation as well as top performers in their industries, and thus they are more likely to be active in reporting their IC voluntarily due to their resource advantage and visibility (Guthrie, Petty & Ricceri 2006, Yi & Davey 2010). Secondly, because the share-holding structure in the Chinese stock market is unique, these dual-listed companies represent a 'unique' market (Yi & Davey 2010).

This research employed the dataset from Yi and Davey (2010). In Yi and Davey's research, the data were collected through content analysis of corporate annual reports. A comprehensive IC disclosure index was constructed as an instrument to code annual reports of the sample firms. The index includes three elements: a list of IC attributes (five relating to internal capital; seven to external capital; and four to human capital); weightings for category attributes (internal capital 30%, external capital 46% and human capital 24%); and disclosure quality criteria [a six-point quality scale (0-5)].

For the purpose of this research, the data relating to overall IC disclosure and the disclosure of each IC category by firms were reorganised in terms of industry type, company size and performance. A series of statistical tests, such as *t*-test and correlation test, were conducted to examine the relationships between IC disclosure and the aforementioned variables in the Chinese mainland context.

## Analysis and Results

### IC DISCLOSURE AND INDUSTRY TYPE

It has been indicated by several prior studies that industry type affects the level of IC disclosure since stakeholders' expectations as well as scrutiny from the public and special interest groups differ across various industries (Firer & Williams 2003; Guthrie & Petty 2000; Oliveira et al. 2006). Various methods in previous research had been used to capture industry effects on IC disclosure. For instance, Guthrie and Petty (2000) employed the 2-digit industry classification code provided by the Australian Stock Exchange (ASX) to classify their sample into six industry clusters. Through comparison amongst the clusters, they found that no individual industry reported IC to a greater extent than any other. Firer and Williams (2003) focused on IC disclosure in finance, electrical and IT (information technology) industries and found that there was only a moderate industry effect. Nevertheless, Oliveira et al. (2006) observed a statistically significant effect through classifying industry into intangible intensive industries and intangible non-intensive industries.

In the current study, the researchers divided the sample companies into two groups: the Service group (22 firms, usually rich in IC) including such industries as finance, business services and utilities, and the Industry group (27 firms, usually rich in tangibles) comprising such industries as energy, material and industrial/consumer goods. These two industry groups (along with agriculture) are considered the key industry sectors by the Chinese government. *T*-tests of mean disclosure scores of internal capital, external capital, human capital and the overall IC, for comparing the reporting practices between the two industry clusters, were carried out. The results are presented in Table 2<sup>5</sup>

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<sup>5</sup> The detailed descriptive statistics and *t*-test results (as well as the following statistical results regarding firm size and corporate performance) can be obtained from the authors.

**Table 2**  
Results of Industry Effect on IC disclosure

Internal capital		External capital		Human capital		Overall	
Service	Industry	Service	Industry	Service	Industry	Service	Industry
0.36	0.43	0.49	0.42	0.53	0.44	0.46	0.43
<i>t</i>	Sig. ( <i>p</i> )	<i>t</i>	Sig. ( <i>p</i> )	<i>t</i>	Sig. ( <i>p</i> )	<i>t</i>	Sig. ( <i>p</i> )
-1.417	.257	1.432	.159	1.411	.165	0.769	.445

It can be found that there were no statistically significant differences in the disclosure of internal capital, external capital, human capital and the overall IC between the two industry clusters. The results were quite surprising since it was expected that service oriented firms with fewer tangible assets should have a significantly greater disposition to report IC in order to keep stakeholders informed regarding their value creating activities.

#### IC DISCLOSURE AND FIRM SIZE

Some prior studies (Li et al. 2008; Shareef & Davey 2006; White, Lee & Tower 2007; Williams 2001) have indicated a size effect on IC disclosure. Total assets or turnover is generally employed as a proxy to denote the size of firms. In the present study, the researchers used total assets prepared by the sample companies in accordance to International Financial Reporting Standards (IFRS) as a means of denoting firm size. Two methods were applied to determine whether there was a size impact on IC disclosure by the Chinese mainland companies. Firstly, the sample was split into two groups: “large” companies and relatively “small” companies according to an arbitrary value of RMB 50 billion of total assets.<sup>6</sup> Provided a company has total assets of RMB50 billion or more, it was recognised as a large company, otherwise it was classified as a “small” company. On this classification, there were 20 large companies and 29 small companies. To analyse differences in IC reporting practices between the two groups, *T*-tests regarding the mean disclosure scores of each IC category as well as the overall IC were carried out (refer to Table 3).

**Table 3**  
Results of Size Effect on IC disclosure

Internal capital		External capital		Human capital		Overall	
Large	Small	Large	Small	Large	Small	Large	Small
0.42	0.39	0.53	0.40	0.54	0.44	0.51	0.41
<i>t</i>	Sig. ( <i>p</i> )	<i>t</i>	Sig. ( <i>p</i> )	<i>t</i>	Sig. ( <i>p</i> )	<i>t</i>	Sig. ( <i>p</i> )
0.510	.613	3.311*	.002	1.425	.161	2.792*	.008

**Note:** \*significance levels are two-tailed

It was found that there were highly significant differences ( $p < .01$ ) in external capital disclosure (0.53 vs 0.40) and overall IC disclosure (0.51 VS 0.41) between the large and small companies. There were no significant differences with regard to internal capital and human capital disclosure, although the mean disclosure scores on these two categories were higher among the large companies (0.42 VS 0.39 and 0.54 VS 0.44 respectively).

The second method used to examine the size effect on IC disclosure was to test the correlation between the disclosure score (of each category as well as the overall IC) and the total assets using the Pearson correlation coefficient (*r*). The results are presented in Table 4.

<sup>6</sup> ‘RMB’ refers to the Chinese currency, the full name of which is Ren Min Bi.



**Table 4**  
Correlation between company size and IC disclosure

Variable	Internal capital	External capital	Human capital	Overall
Correlation between Total Assets and ...	$r = 0.15$	$r = 0.20$	$r = 0.32^*$	$r = 0.31^*$
	Sig. ( $p$ ) = .304	Sig. ( $p$ ) = .178	Sig. ( $p$ ) = .025	Sig. ( $p$ ) = .028

**Note:** \* significance levels are two-tailed.

There were positive and significant correlations between total assets and human capital disclosure and total assets and overall IC disclosure ( $p < .05$ ). The relationships between total assets and internal capital disclosure, and total assets and external capital disclosure were positive, but weak.

#### IC DISCLOSURE AND CORPORATE PERFORMANCE

As for the relationship between IC disclosure and corporate performance, previous studies reported mixed results. For example, Williams (2001) observed a significantly inverse relationship through investigating 40 UK companies. Sonnier et al (2007) obtained similar findings through examining 143 high-tech companies in the US. However García-Meca et al. (2005) and Li et al. (2008) found a significantly positive relationship in Spain and UK respectively. Net profit or return on total assets (ROA) is often used as a proxy for corporate performance.

To investigate the status in the Chinese mainland environment, the researchers carried out a correlation test between corporate performance and the disclosure score (of each category of IC and the overall IC). Net profit (attributable to shareholders of the company) was employed as a proxy since it is a widely-accepted performance metric in mainland China. The results are shown in Table 5 below.

**Table 5**  
Correlation between Corporate Performance and IC disclosure

Variable	Internal capital	External capital	Human capital	Overall
Correlation between Net Profit and ...	$r = 0.24^*$	$r = 0.07$	$r = 0.26^*$	$r = 0.26^*$
	Sig ( $p$ ) = .051	Sig ( $p$ ) = .316	Sig ( $p$ ) = .035	Sig ( $p$ ) = .038

**Note:** \* significance levels are one-tailed.

The results indicate that there were significantly positive relationships between net profit and internal capital disclosure, net profit and human capital disclosure, and net profit and the overall IC disclosure ( $p \leq .05$ ). For the disclosure of external capital, its relationship with net profit was weak although positive.

## 6. DISCUSSION

This paper examines the relationships between IC disclosure and industry type, firm size and corporate performance in the Chinese (mainland) context. It was found that industry type did not have a significant influence on IC reporting practices of Chinese mainland companies. A

possible explanation is that the overall level of IC disclosure across all the firms was low during the period [refer to Yi & Davey (2010)], so that the industry effect was not apparent.

The results also indicate that large companies generally reported more IC information than the small companies. These results were not surprising because of the following reasons. Firstly large firms are usually rich in various forms of intellectual capital, and therefore they are expected to report more IC information. Secondly large firms have a wider range of stakeholders as well as more responsibilities to the stakeholders. Thus they should disclose more IC information so as to discharge their accountability to various stakeholders. Finally large firms have relatively lower costs to accumulate and disseminate IC information, and might have lower costs of competitive disadvantages associated with the disclosure (Meek et al. 1996).

A significantly positive relationship was found between corporate performance and overall IC disclosure. That is, firms with better performance report more IC information. This finding was unsurprising because the disclosure of IC information is one of the most effective means for firms to justify their superior performance (García-Meca et al. 2005).

## LIMITATIONS AND FUTURE RESEARCH

The authors acknowledge several limitations to this research. To begin with, the sample size was relatively small and hence problematic to generalise the overall situation of the effects. Furthermore it applied a small number of explanatory variables, and therefore the explanatory power on IC disclosure was not strong. In future research, a comprehensive regression analysis with more data (e.g. top 100 A-share companies) as well as more explanatory variables could be used to address the aforementioned limitations.

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