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Financial statement informativeness and intellectual capital disclosure: An empirical analysis

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Abstract

Purpose – The purpose of this paper is to analyse the relationship between financial statement informativeness (FSI) and intellectual capital disclosure (ICD).

Design/methodology/approach – While FSI was measured as the explanatory power of financial information in explaining market value, ICD was collected through content analysis of annual reports. A sample of 126 US companies, divided into two groups – high-tech and low-tech companies – were used in this study. Empirical analysis was carried out using the Poisson regression method.

Findings – The results show a negative (substitutive) relationship between FSI and ICD, especially in high-tech companies. This indicates that companies with low FSI disclose more information about their IC in annual reports.

Practical implications – This study confirms the role of voluntary ICD as a solution towards mitigating the problem of the distortion of financial information due to the lack of accounting recognition of IC as an asset in the financial statements.

Originality/value – This is the first empirical study to analyse the relationship between FSI and ICD. Therefore, it serves as feedback to the regulators and standard-setters that recently published recommendations on voluntarily disclosing IC.

Keywords Intellectual capital, Disclosure, Financial statement informativeness, High-tech companies, USA

Paper type Research paper

1. Introduction

Investments in *intellectual capital* (hereafter IC), such as for research and development (R&D), human resources, employee training, customer relations, information systems and other areas are seen today as being the main value creators for several companies and economic sectors. According to the Organisation for Economic Cooperation and Development (OECD, 2013), these IC investments continue to increase and have reached a high level in today's world. They have even exceeded dedicated physical and financial capital expenditures in certain developed economies. This is especially the case in the

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USA where economic indicators have shown that IC investments have exceeded physical and financial capital since 2002 (Corrado *et al.*, 2005, 2010; OECD, 2006a, 2006b, 2013).

However, despite the increased growth in IC investments and their economic importance for companies and the economy in general, their accounting recognition in corporate financial statements is still not evident. In the specific case of the USA, the Financial Accounting Standards Board (FASB) accounting rules in effect put forth several reasons that generally hinder the recognition of IC investments in financial statements, including the difficulty related to their control and measurement and the difficulty of evaluating future cash flows and the related high level of uncertainty.

Therefore, according to the conservatism principle, most IC investments are to be immediately expensed when incurred, while the benefits resulting from these investments will be recorded later (Lev and Zarowin, 1999; Lev *et al.*, 2005; Zéghal and Maaloul, 2011). As a result, the main accounting principle of periodically matching costs with revenues is seriously biased, affecting in turn the financial statement informativeness. In this context, some researchers showed that the non-recognition of IC in financial statements has led to the deterioration of the value-relevance of financial information in explaining market value (Lev and Zarowin, 1999; Brown *et al.*, 1999; Core *et al.*, 2003; Dontoh *et al.*, 2004).

This non-recognition of IC could also have other adverse socio-economic consequences for companies, financial markets and society in general. Indeed, if a company's financial statements are established based on conservative estimates of earnings and book value, inefficiencies (myopia) may arise in the resource allocation process on the financial market (Lev *et al.*, 2005; Zéghal and Maaloul, 2011). In this respect, some empirical studies have shown that the non-recognition of IC aggravates the information asymmetry between a company's insiders and outsiders (Aboody and Lev, 2000; Mohd, 2005), resulting in misvaluation of the company and its future earnings (Lev *et al.*, 2005; Ali *et al.*, 2012), making company shares relatively illiquid (Boone and Raman, 2001) and increasing its cost of capital (Seow *et al.*, 2006; Giovly and Shi, 2008).

To prevent this distortion of the resource allocation mechanism on the financial market, several initiatives have been taken these past few years by accounting (FASB, 2001; IASB, 2010; etc.), financial (SEC, 2003; EFFAS, 2008) and economic (OECD, 2006a, 2006b, 2013; EC, 2011) standard-setters to improve the quality of information provided to investors and other users. These initiatives resulted in the development of a certain number of frameworks and guidelines with the goal of encouraging the voluntary disclosure of IC information outside of financial statements to offset any shortcomings in financial information regarding IC.

Although there are also a number of theoretical and descriptive studies that encourage managers to voluntarily disclose IC information as a solution to compensate for the loss of the relevance of financial information (Lev, 2003; Skinner, 2008; Zéghal and Maaloul, 2011), there is no study that has attempted to validate this view empirically. This is precisely the objective of our study, according to which we attempt to empirically analyse the relationship between financial statement informativeness and IC disclosure. Following the publication of these frameworks and guidelines for disclosing IC, our study can be seen as a tool that can be used to assess their current application by companies and to empirically validate the theoretical statements made by researchers and standard-setters.

The rest of this article will be organised as follows: Section 2 briefly reviews the accounting treatment of IC. Section 3 then defines the concepts of financial statement informativeness and voluntary disclosure, while looking at the main results found in the academic literature. The hypothesis development for our study is presented in Section 4. Section 5 discusses the methodological choices made in our study. The results obtained and their analyses will be covered in Section 6. Lastly, the conclusion summarizes the main results of this research.

2. Accounting treatment of IC

An IC investment appears in the corporate assets if it meets at the same time the definition of an intangible asset and the accounting recognition criteria. However, the accounting standards impose, for the accounting of IC, conditions that are so restrictive that only few investments can appear in the company's balance sheet (Zéghal and Maaloul, 2011).

An intangible asset is defined by the FASB (ASC 350) as an "asset, other than a financial asset, that lacks physical substance". This definition must, nevertheless, be interpreted jointly with the general definition of an "asset". An asset is defined by the FASB (SFAC 6, §25) as a "probable future economic benefits obtained or controlled by a particular entity as a result of past transactions or events".

Following this general definition of an asset, the notion of "control" is going to raise an accounting problem with IC. According to the FASB (SFAC 6, §26), an enterprise controls an asset if the enterprise has the power to obtain the future economic benefits flowing from the underlying resource and also can restrict the access of others to those benefits. In this context, in the case of IC, some questions arise such as the protection of employees' skills and knowledge. Lev (2001) underlines that companies do not own their employees or the ideas which they have in their heads. He discusses the control problem under the title of "Partial Excludability". For example, when a company invests in training its employees, other companies will benefit from such investments if the trained employees switch employers. As a result, these IC investments could not be capitalised because of the lack of certainty relating to the contractual relation between the company and its employees.

Upton (2001) also underlines that an enterprise may possess items that meet the definition of assets, but will still not recognise those items in financial statements. Indeed, an important recognition criterion required by accounting standards (FASB, SFAC 5 §63), namely, "the reliability of measurement" of asset cost, raises another accounting problem with IC. This criterion could be easily satisfied if the asset is separately acquired (SAFS 142) because the acquisition price was generally determined during the transaction and appears under monetary form or other monetary assets, and, therefore, the cost can be reliably measured. It could be also easily satisfied in the case of business combination (SFAS 141) when the asset cost is the asset's fair value at the time of business combination. The fair value can in fact be reliably measured if there is a market price provided in reference to an active market. However, the reliability of measurement criterion presents great difficulty in the case of internally generated assets such as software, patents, trademarks, and the like, i.e. the results of R&D activity.

For example, according to FASB rules, R&D expenditures must be expensed when incurred (SFAS 2), except for the development costs of computer software that can be capitalised (SFAS 86). However, the capitalisation of these costs is conditional on the

successful achievement of technological feasibility tests. In this sense, the costs incurred to establish the technological feasibility of a product are considered R&D under SFAS 2 and expensed as incurred. Inversely, the costs incurred after establishing technological feasibility and before the product is available for general release are capitalised. According to the FASB's conclusion in SFAS 2, many reasons can explain the decision for immediate expensing of R&D costs. These reasons are related to uncertainty of future benefits, inability to measure future benefits, lack of a causal relationship between costs and benefits and lack of usefulness to investors.

3. Financial statement informativeness and IC disclosure

3.1 Financial statement informativeness

By financial statement informativeness we mean the accuracy of the signal coming from the company's financial reporting system (such as earnings and book value of equity). A piece of financial information is said to be "informative" if it is relevant or useful, and can therefore make a difference in the decisions made by users of a company's financial statements (Tasker, 1998; Lev and Zarowin, 1999; Lougee and Marquardt, 2004; Francis *et al.*, 2008; Hail, 2013).

According to the market efficiency theory, all relevant financial information should be immediately and completely transposed into the company's stock price. Along with this, some authors, including Collins *et al.* (1997) and Aboody *et al.* (2002), defined the relevance of financial information as the extent to which financial reporting explains the intrinsic value of the stock.

By using different companies' valuation models, researchers have tried to look at the link between financial information and market value over the past few decades. In this area, Lev and Zarowin (1999) used a sample of US companies to show that the usefulness of financial statements to investors has clearly diminished over the past two decades from 1977 to 1996. They concluded that the inability to recognise the IC information has led to diminished relevance of a company's financial information. Moreover, Brown *et al.* (1999) reported that, over a period from 1958 to 1996, the relevance of earnings and book value of equity has declined in terms of explaining stock prices of US companies. According to these authors, this decline is in fact due to the substantial costs associated with IC investments. These costs were charged to expenses instead of being capitalised, thus reducing earnings and the book value of equity.

In a similar study, Dontoh *et al.* (2004) also found that explanatory power (R^2) for the regressions of stock price on earnings and book values of US companies had dropped over the period from 1983 to 2000. Evidence has also shown that this decline was more marked in highly IC-intensive companies. For their part, Liang and Yao (2005) confirmed this trend by using a sample of Taiwanese companies in the high-tech industry. Indeed, their results show that traditional financial information does not provide any significant explanatory power in terms of the company's market value.

Using 20 years of US data, Fung *et al.* (2010) also documented a declining trend in R^2s of the association between stock prices and financial information. More recently, Hail (2013) used a large international sample to examine whether financial statements have lost their relevance over the past 30 years (from 1981 to 2008). He found that the loss in relevance of financial statements continues in recent years, especially in common law

countries with strong institutions, strong investor protection, strict disclosure requirements and integrated markets.

3.2 IC disclosure

Given that current accounting standards do not allow the capitalisation of most IC investments, several regulators and standard-setters have recommended that companies voluntarily disclose information on IC beyond the financial statements (for example, in annual reports). FASB (2001) describes voluntary disclosure as being information primarily outside of financial statements and complementary notes that is not explicitly required by accounting rules or standards. This type of disclosure includes financial information and other types of non-financial information that company managers consider relevant for the needs of different user groups (Beattie *et al.*, 2004; Bin Abdullah and Ku-Ismail, 2008). Non-financial information may contain both qualitative and quantitative indicators (OECD, 2006a).

Still in the early stages of development, the studies on IC disclosure generally have their theoretical foundations in economic theories such as agency theory and signalling theory, as well as socio-political theories, such as the stakeholder theory and the legitimacy theory (Guthrie *et al.*, 2004; Beattie and Thomson, 2007; Alberti-Alhtaybat *et al.*, 2012). These studies can be broken down into three streams: studies on:

(1) the extent and type of information disclosed on IC;

(2) the underlying determinants for disclosing IC information; and

(3) the consequences of disclosing information on IC.

In the first stream, several longitudinal studies show that the companies increased their level of IC disclosure over time (Abdolmohammadi, 2005; Vergauwen *et al.*, 2007; Wagiciengo and Belal, 2012; De Silva *et al.*, 2014). Other studies have examined the types of IC information disclosed by companies to investigate whether they are quantitative (numerical) or rather qualitative (descriptive/narrative) in nature. In this context, the majority of studies find that companies disclose more information about IC in a qualitative (descriptive/narrative) form than in a quantitative (numerical) form (Beattie *et al.*, 2004; Striukova *et al.*, 2008; Soon Yau *et al.*, 2009; Li *et al.*, 2008; De Silva *et al.*, 2014).

In the second stream, studies report many factors that could encourage or, conversely, discourage IC disclosure. Here, a number of studies found that the level of IC disclosure increases with the company's size (Bozzolan *et al.*, 2003; Oliveira *et al.*, 2006; Soon Yau *et al.*, 2009; Kumar, 2013), its performance (Cerbioni and Parbonetti, 2007), its growth level (Garcia-Meca *et al.*, 2005) and its involvement in R&D activities (Zéghal *et al.*, 2007). Other studies also found additional factors that could positively affect the level of IC disclosure. These include items such as the efficiency of the system of corporate governance (Zéghal *et al.*, 2007; Cerbioni and Parbonetti, 2007; Li *et al.*, 2008); operating in a high-tech sector (Abdolmohammadi, 2005; Sonnier, 2008; Kumar, 2013), being listed on several national and foreign stock markets (Garcia-Meca *et al.*, 2005) and the auditing of accounts by the *Big 4* (Oliveira *et al.*, 2006). However, on the other hand, the literature shows that certain factors can prevent companies from disclosing information on IC. In this context, certain studies report that the level of IC disclosure decreases as property becomes concentrated in the hands of a few shareholders (Oliveira *et al.*, 2006; Cerbioni and Parbonetti, 2007; Li *et al.*, 2008; Kumar, 2013), and also as corporate property costs go up (Jones, 2007).

Lastly, *according to the third stream*, several studies show that increased disclosure of information on IC improves corporate value on the financial market (Abdolmohammadi, 2005; Gerpott *et al.*, 2008; Vafaei *et al.*, 2011), while at the same time increasing share liquidity (Graham *et al.*, 2005), which reduces the company's cost of capital (Kristandl and Bontis, 2007; Mangena *et al.*, 2010; Boujelbene and Affes, 2013). This contributes to greater efficiency in the markets, and, for companies, it means better resource allocation on the financial market (OECD, 2006a; Zéghal and Maaloul, 2011).

4. Developing the hypothesis

The development of our hypothesis is based on the previous literature on the relationship between financial statement informativeness and voluntary disclosure of extra-financial information. According to Verrecchia (1990) low financial statement informativeness indicates that there is a high asymmetry of information between company managers and shareholders. This information asymmetry creates a demand for more information from shareholders, and also provides a reason for managers to provide this information, as the value of this extra-information is very high in this situation. In this setting, Cohen (1992) showed that biotechnology companies voluntarily disclose several types of extra-information due to the high information asymmetry between the company and its investors, and, therefore, to the failure of traditional financial information to provide relevant information to investors.

Moreover, Lang and Lundholm (1993) reported that companies with low financial statement informativeness have a higher disclosure score, using the scores calculated by the *Association for Investment Management and Research* as a proxy for voluntarily disclosure. Tasker (1998) documented a similar negative or substitutive relationship between the probability of a company providing additional voluntary disclosures through "conference calls" and the financial statement informativeness. For their part, Lougee and Marquardt (2004) showed that companies that voluntarily disclose pro-forma earnings in the USA are companies with the lowest financial statement informativeness. More recently, Ball *et al.* (2013) found that *Management Discussion and Analysis* disclosures are more informative when the financial statements are less informative and vice versa.

However, contrary to expectations, Francis *et al.* (2008), using a sample of US companies, found that companies with high financial statement informativeness have more expansive voluntary disclosures in their annual reports than companies with low financial statement informativeness. According to these authors, even companies with high financial statement informativeness may also wish to disclose more information externally because the market will otherwise interpret non-disclosure as bad news, and will discount the company's value accordingly.

Consequently, we can conclude that the results of the previous studies on the relationship between financial statement informativeness and voluntary disclosure of extra-financial information are generally mixed. Moreover, to the best of our knowledge, there are no studies on the relationship between financial statement informativeness and voluntary disclosure of IC information. This leads directly to the hypothesis of our study, according to which we will assume that companies which invest in IC have low financial statement informativeness due to the lack of accounting recognition of IC as an asset. All things being equal, these companies will voluntarily disclose information on

IC to mitigate the problem of distortion of their financial information, where there is an inverse relationship between financial statement informativeness and IC disclosure.

This falls into economic and managerial logic according to which information deserves to be produced and disseminated insofar as the anticipated value exceeds its production and dissemination costs. We state this prediction formally as our hypothesis:

H. There is a negative (substitutive) relationship between financial statement informativeness and IC disclosure.

5. Methodology

5.1 Selecting the sample

Our sample is based on all US companies that were listed on the S&P500 index during 2009[1].

From this initial sample, we have eliminated companies belonging to the SIC 6 (banks, insurance and real estate companies) due to the different accounting rules applied to these sectors (153 companies). We also excluded companies whose fiscal years do not end on December 31 to ensure that all companies were subject to the same industry conditions and that investors had access to the same micro-economic and industry data during the sample period (107 companies).

Given that the "financial statement informativeness" variable is calculated for each company over the past 10 years in a time series, we also eliminated the companies that have been in existence for less than 10 years (69 companies). In addition, companies who have not published their annual reports and those for which some data were missing from Bloomberg Professional database were also excluded (35 companies). Finally, we eliminated any company with a negative book value of equity (ten companies), which reduced our final sample to a total of 126 listed US companies[2].

To take into account the very different role of IC from sector to sector, we chose to divide our sample, as did Francis and Schipper (1999) and Lougee and Marquardt (2004), into two groups: High-tech and low-tech companies. To do this, we decided on a stringent classification scheme as provided by Francis and Schipper (1999) based on three-digit SIC codes.

Table I shows that our sample is dominated by the group of low-tech companies (83 companies), which represents 65.9 per cent of our overall sample. High-tech companies (43 companies), however, represent only 34.1 per cent of the overall sample, which is not surprising since these companies generally represent the new economy.

5.2 Measuring variables

5.2.1 Measuring the IC disclosure variable. To measure the IC disclosure variable, we used the content analysis method. This method involves analysing the corporate annual reports (in classical form and in the 10-K Form[3]) to extract financial and non-financial qualitative and quantitative data on a company's IC. These data were coded using a

Table I.
Sample distribution by groups of companies

Groups	No.	(%)
High-tech companies	43	34.1
Low-tech companies	83	65.9
Total	126	100

coding sheet, which attributed scores to create indices for measuring the IC disclosure variable.

The content analysis method: Content analysis is a data collection technique that involves coding qualitative and quantitative information into predefined categories to derive patterns in the presentation and reporting of the information (Zéghal and Ahmed, 1990; Guthrie *et al.*, 2004; Krippendorff, 2004).

To codify the IC information, we chose to use sentences as analysis units for our study. Indeed, there has long been a debate in the accounting literature on using words, sentences, paragraphs or pages as the code base. In this context, most researchers (Milne and Adler, 1999; Bozzolan *et al.*, 2003; Beattie and Thomson, 2007) agree that the sentence as an analysis unit is the most reliable and preferred over other analysis units because the objective is to describe the meaning of the document being analysed.

Lastly, to ensure that our content analysis is reliable, we carried out the following tasks:

- *To ensure stability*: The first author analysed the contents of annual reports from a sub-sample of ten companies. The contents of these reports were reanalysed a second time by the same author one month later. The results were compared and resulted in Krippendorff's alpha of 0.912, which was deemed satisfactory[4].
- *To ensure reproducibility*: The analysis of the contents in the first ten annual reports was redone by the second author. The results were compared and led to Krippendorff's alpha of 0.822, which was deemed satisfactory.

IC disclosure indices: Before measuring the IC disclosure variable, it is essential to first determine the checklist of IC items to look for in annual reports. To do this, we adopted a stringent classification of categories and subcategories (items) for IC, as developed by Li *et al.* (2008). This classification consists of dividing the IC into three categories, i.e. human capital, structural capital and relational capital, which are again subdivided into several subcategories (items) (see Appendix).

The main reasons motivating our choice to adopt this IC classification list are the following:

- IC categories and items are defined clearly and in an operational manner;
- it is clear when an item belongs or does not belong to a particular category; and
- lastly, this list enabled us to discuss in advance the content of each category and item, and examples of sentences, which increases the reliability of our coding sheet.

On the basis of this IC classification, we built two indices to measure the IC disclosure variable: one on the basis of disclosure quantity and the other measures disclosure quality.

5.2.1.1 Index for measuring IC disclosure quantity. Our first index is based on the volume or frequency of IC disclosure. Indeed, one of the main underlying assumptions for analysing content is that the volume or the frequency of disclosure of a specific item shows to what extent the person preparing the report considered this item to be important (Striukova *et al.*, 2008). In this regard, Beattie and Thomson (2007, p. 141) point out that repetition is a communication strategy used to accentuate, reinforce and show the importance granted by the manager to the subject. This importance given by

the reporting entity to the different categories of information is therefore assumed to be reflected by the quantity of information disclosed (Krippendorff, 2004). To determine the volume or frequency of IC disclosure, we counted the number of times that an item appeared in our predefined list of items.

Our first index for disclosure is therefore calculated as:

$$Quant\_IC = Total\ number\ of\ items\ disclosed\ about\ IC$$

Based on Zéghal *et al.* (2007) and Li *et al.* (2008), if a sentence contained more than one item related to IC, it was broken down into as many sentences needed to take into account all IC items. However, certain authors, including Beattie and Thomson (2007), and Sonnier (2008), pointed out that only measuring the quantity of IC disclosure does not suffice as an indicator, thus the necessity of developing measurements based on the quality of disclosure.

5.2.1.2 Index for measuring IC disclosure quality. At this time, measuring disclosure quality is one of the main topics debated and unresolved in the literature on disclosure.

Given the difficulty of directly estimating disclosure quality, certain studies on disclosure indices assume that the quantity of disclosure regarding specific subjects may be considered to be a proxy for the quality of disclosure (Botosan, 1997; Beattie *et al.*, 2004). This point of view is nevertheless completely wrong (Cerbioni and Parbonetti, 2007; Beattie and Thomson, 2007). Indeed, several researchers, including Hackston and Milne (1996), and Guthrie *et al.* (2004), recommend using an approach that takes into account the quality of disclosure by examining the existence of the disclosure, the disclosure category and the type of disclosure. Based on these recommendations, we developed for this study our own index based on the orientation of the information disclosed on IC, such as historic/forward-looking orientation and qualitative/quantitative orientation.

As illustrated in Figure 1, for each sentence containing IC information, we attributed the following scores:

- *Score 1*: If the sentence contains qualitative historic information on IC.
- *Score 2*: If the sentence contains quantitative historic information on IC.
- *Score 3*: If the sentence contains qualitative forward-looking information on IC.
- *Score 4*: If the sentence contains quantitative forward-looking information on IC.

Our second index is therefore calculated as:

$$Qual\_IC = Sum\ of\ scores\ assigned$$

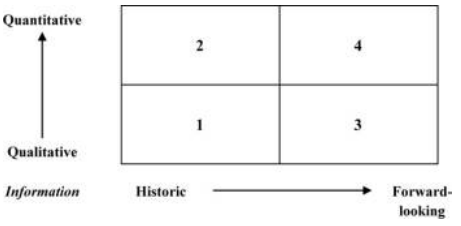

Figure 1.
Orientation of the information disclosed on IC

To ensure that the index captured quality and not quantity of disclosure, we took into account an item disclosed by the company only once, even if it was repeated several times in the report (Oliveira *et al.*, 2006; Jones, 2007; Cerbioni and Parbonetti, 2007).

Therefore, Figure 1 implies that the more information is future-oriented and is of a quantitative nature, the better its quality. Indeed, the heaviest weight (score 4) is assigned to quantitative forward-looking information because this type of information is considered more relevant to users of information, especially stock market investors, and will also increase the reputation and credibility of management.

Documents analysed: In the same manner as several researchers, including Jones (2007) and Francis *et al.* (2008), we chose to perform our content analysis on annual reports (in classical format and on the 10-K Form) of US companies. We chose the annual report as the basis for content analysis for the following reasons:

- It is considered to be the most important source of information and continues to play a pivotal role in corporate communications to its internal and external users (Botosan, 1997; Guthrie *et al.*, 2004; Oliveira *et al.*, 2006; Bin Abdullah and Ku-Ismail, 2008).
- It is the only communication source that is produced on a regular basis by all listed companies and offers the possibility of performing comparative analyses of management policies through the reporting periods (Vergauwen *et al.*, 2007).
- Several previous studies found that the amount of disclosure in annual reports is positively correlated with the amount of disclosure provided in other media, such as Web sites, press releases and conference calls (Lang and Lundholm, 1993; Gerpott *et al.*, 2008). This indicates that companies coordinate their disclosure policies. Therefore, the choice of measuring disclosure produced by any reporting source could be considered a proxy for the general level of disclosure provided by the company (Botosan, 1997).
- Lastly, a number of researchers, including Guthrie *et al.* (2004) and Striukova *et al.* (2008), suggest limiting the number of documents analysed in a study to prevent the researcher's work from being too daunting. Limiting the field of investigation to annual reports provides a relevant and useful proxy for analysing information disclosed for corporate IC.

5.2.2 Measuring the financial statement informativeness variable. The financial statement informativeness (*FSI*) has been examined in term of value relevance. Two different empirical measures have been used in previous research. The first one is the "determination coefficient (R^2)" used in association studies to assess the explanatory power of the financial information in explaining market behaviour (Amir and Lev, 1996; Brown *et al.*, 1999; Dontoh *et al.*, 2004; Rahman and Mohd-Saleh, 2008; Hail, 2013) and the second one is the "earnings response coefficient (ERC)" used in event studies to assess the effect of the earnings announcement on security returns (Ryan and Zarowin, 2003).

We adopt the determination coefficient (R^2) because of its relevance to this research while avoiding some limitations associated with ERC[5]. The adjusted R^2 is estimated through the following linear regression:

$$Piq = \beta 0 + \beta 1\, EPSiq + \beta 2\, BVPSiq + \beta 3\, EPS\_Negiq + \mu iq$$

Where:

Piq	= Stock price for company i at the end of the second month following quarter *q*.
EPSiq	= Net earnings or net loss per share for company *i* in quarter *q*.
BVPSiq	= Book value of equity per share *i* at the end of quarter *q*.
EPS_Negiq	= 1 if the EPS is negative; if not, 0.
μiq	= Other information.

A high adjusted R^2 value would indicate that the financial information largely explains the variation in corporate stock price. Therefore, this means that this financial information is considered to be "informative" for the market shareholders. Conversely, where the adjusted R^2 value is low, this would indicate that the variation in stock price can be explained by other non-financial information, in particular information on IC that is not taken into account in the corporate financial statements.

Given that this equation is estimated in time-series for each company to determine the financial statement informativeness (*FSI*), we used, like Amir and Lev (1996) and Lougee and Marquardt (2004), quarterly data over a period of 10 years (10 years × 4 quarters = 40 observations). Indeed, our assumption is that the past financial statement informativeness is a reasonable proxy for the current financial statement informativeness (Lougee and Marquardt, 2004).

5.2.3 Measuring control variables. Six control variables were used in this study to control their effect on disclosure of IC information:

(1) Company size (*SIZE*) is measured by the natural logarithm of the book value of total assets (Zéghal *et al.*, 2007; Cerbioni and Parbonetti, 2007).

(2) Performance (*ROA*) is measured using the *return on assets* ratio, i.e. net earnings divided by total assets (Williams, 2001; Oliveira *et al.*, 2006).

(3) Risk (*BETA*) is measured using beta from the capital asset pricing model (Garcia-Meca and Martinez, 2007).

(4) Growth (*GRW*) is measured by the company's annual sales growth (Cerbioni and Parbonetti, 2007, Garcia-Meca and Martinez, 2007; Soon Yau *et al.*, 2009).

(5) Leverage (*LEV*) is measured using the total debt/book value of equity ratio (Garcia-Meca *et al.*, 2005; Cerbioni and Parbonetti, 2007).

(6) Analysts' coverage (*COV*) is measured by the number of analysts following the company (Boujelbene and Affes, 2013).

All these variables are obtained from Bloomberg professional database.

5.3 Research equations and analysis method

To meet our research objective, we propose to empirically test the following two equations:

Equation (A) based on the quantity of IC disclosure:

$$Quant\_ICi = \beta 0 + \beta 1\, FSIi + \beta 2\, SIZEi + \beta 3\, ROAi + \beta 4\, BETAi + \beta 5\, GRWi + \beta 6\, LEVi + \beta 7\, COVi + \mu i$$

Equation (B) based on the quality of IC disclosure:

$$Qual\_ICi = \beta 0 + \beta 1\, FSIi + \beta 2\, SIZEi + \beta 3\, ROAi + \beta 4\, BETAi + \beta 5\, GRWi + \beta 6\, LEVi + \beta 7\, COVi + \mu i$$

Where:

Quant_ICi = Index measuring the *quantity* of IC disclosure for company *i*.
Qual_ICi = Index measuring the *quality* of IC disclosure for company *i*.
FSIi = Financial statement informativeness for company *i*.
SIZEi = Size of company *i*.
ROAi = Performance of company *i*.
BETAi = Risk of company *i*.
GRWi = Sales growth of company *i*.
LEVi = Leverage ratio for company *i*.
COVi = Analysts' coverage for company *i*.

Given that the dependent variables in equations A and B (*Quant_IC* and *Qual_IC*) are count data, which do not include negative values (because they measure the number of occurrences of an event: the information disclosed on IC), the linear regression method[6] should not be applied.

Based on Zéghal *et al.* (2007) and Cerbioni and Parbonetti (2007), in this study, we used the Poisson regression method to estimate equations A and B. This method is considered to be the best approach to process count data (Kennedy, 2003). The data were analysed using the SPSS 18 software.

6. Results

6.1 Descriptive statistics

Table II presents the means, standard deviations, medians, minimum and maximum values of all the variables. The mean of index measuring the quantity of IC disclosure (*Quant_IC*) is approximately 101 and varies between 27 and 245 for information disclosed on IC in the annual reports of US companies. Moreover, the mean of index measuring the quality of IC disclosure (*Qual_IC*) is approximately 47 and varies between 21 and 72 for scores assigned to the information disclosed on IC.

Table II also shows that the mean of financial statement informativeness (*FSI*), measured using the determination coefficient (adjusted R^2) from the linear regressions of stock price on earnings and book values is 27.6 per cent. This coefficient varies between 7.5 and 88.9 per cent.

To compare the two company groups (high-tech and low-tech) regarding IC disclosure (*Quant_IC* and *Qual_IC*), we used the Mann–Whitney *U* test[7]. The results for the mean difference appear in Table III. These results tell us that high-tech companies disclose more information on IC (*Quant_IC* = 86.47 and *Qual_IC* = 84.57) than those that are low-tech (*Quant_IC* = 51.60 and *Qual_IC* = 52.58), and that these mean differences are statistically significant ($p = 0.000$).

A better explanation of these results is that high-tech companies have large investments in IC that do not appear in their financial statements given the lack of their accounting recognition as assets by current accounting standards. As a solution, these high-tech companies voluntarily disclose information on their IC to offset any

Variables	*N*	Mean	SD	Median	Minimum	Maximum
Quant_IC	126	100.8	41.9	98.5	27	245
Qual_IC	126	46.9	11.7	47.5	21	72
FSI	126	0.276	0.237	0.227	0.075	0.889
Total assets (in Millions $)	126	19,408	3,189	8,744	1,235	233,323
SIZE (log Total assets)	126	9.229	1.088	9.076	7.12	12.36
ROA	126	0.055	6.885	0.047	−0.171	0.350
BETA	126	1.063	0.262	1.053	0.406	1.784
GRW	126	−0.099	2.373	−0.098	−0.535	1.225
LEV	126	0.709	7.577	0.505	0.000	7.037
COV	126	18.69	7.763	18	4	47

Notes: Variables are defined as follows: *Quant_IC* is the index measuring the quantity of IC disclosure, while *Qual_IC* is the index measuring the quality of IC disclosure. *FSI is the financial statement informativeness measured by the explanatory power (adjusted R^2)* from regressions of stock price on earnings and book values. *SIZE* is the logarithm of total assets, *ROA* is the return on assets used as an indicator of a company's performance, *BETA* is the company's risk measured through the capital asset pricing model (CAPM), *GRW* is the company's growth level measured by the annual sales growth, *LEV* is the company's leverage ratio measured using the total debt/book value of equity ratio, and COV is the analyst's coverage measured by the number of analysts following the company

Table II.
Descriptive statistics for selected variables

Disclosure index	High-tech companies (n = 43) Average rank	Low-tech companies (n = 83) Average rank	Statistic significance
Quant_IC	86.47	51.60	Z = −5.082 Asymp. sig = 0.000***
Qual_IC	84.57	52.58	Z = −4.665 Asymp. sig = 0.000***

Note: ***Significant at the 0.01 level

Table III.
Two sample Mann–Whitney *U* test

shortcomings in financial information regarding IC and to better reflect the real value of the company and its ability to create future earnings. As a result, high-tech companies are more likely to disclose IC information than other companies. These results appear to be consistent with those found by other researchers (including Abdolmohammadi, 2005; and Sonnier, 2008), who found that high-tech sectors disclose more IC information than traditional sectors of the US economy.

Lastly, to compare the two company groups (high-tech and low-tech) regarding financial statement informativeness (*FSI*), we used the student *t*-test[8]. The mean difference results appear in Table IV. These results tell us that the financial statement informativeness is *lower* in high-tech companies (0.248) than in low-tech (0.290). This mean difference is statistically significant at threshold $p < 0.05$.

This result would appear to be due to the fact that current accounting standards in the USA prohibit the capitalisation of most IC investments, thus the distortion of the financial information of companies heavily investing in IC. In this case, the stock price for high-tech companies is no longer based on the financial information (such as earnings or book value of equity), but rather on other relevant non-financial information

like IC information. Our results are indeed consistent with the results of previous studies that found that the financial information was more distorted for high-tech companies than for other companies (Core *et al.*, 2003; Dontoh *et al.*, 2004; Lougee and Marquardt, 2004).

6.2 Correlation analysis

The validation of our theoretical hypothesis will be assessed initially by evaluating the correlation between dependent and independent variables. Correlation coefficients[9] appear on Panel A in Table V for the entire sample and on Panel B and C for high-tech and low-tech companies, respectively.

These results show that the correlation between financial statement informativeness (*FSI*) and IC disclosure (*Quant_IC* or *Qual_IC*) is only significant in high-tech companies (Panel B). This correlation is statistically negative, *which confirms our hypothesis for high-tech companies*. This result could be interpreted as follows: because the current accounting standards prevent companies from capitalising their IC investments, high-tech companies have low financial statement informativeness. To mitigate this distortion problem in the financial information, High-tech companies use other disclosure practices for IC information. In other words, the more the financial statement informativeness is low, the more the high-tech company discloses information on its IC.

Regarding control variables, the results in Table V (Panel A, B and C) show that IC disclosure (*Quant_IC* or *Qual_IC*) is positively and significantly correlated with the company performance (*ROA*) and its growth level (*GRW*). The company size (*SIZE*) and the number of analysts following the company (*COV*) are also positively correlated with IC disclosure (*Quant_IC* or *Qual_IC*), but they are only significant in the high-tech companies (Panel B). The leverage (*LEV*) is also positively correlated with IC disclosure (*Quant_IC* or *Qual_IC*), but its only significant in the low-tech companies (Panel C). Finally, our results reveal a significant negative correlation between company risk (*RISK*) and IC disclosure (*Quant_IC* or *Qual_IC*) in the entire sample (Panel A) and in the high-tech companies (Panel B), respectively.

6.3 Multivariate analysis

The correlation analysis results constitute an initial approach for testing our hypothesis. We will now continue testing this hypothesis using a multivariate analysis by estimating the Poisson (A) and (B) regression equations.

6.3.1 Estimating equation A. The results of the Poisson regression regarding the relationship between the financial statement informativeness and the *quantity* of IC disclosure appear in Panel A of Table VI for the entire sample and on Panel B for the two sub-samples (high-tech and low-tech companies).

FSI	High-tech companies ($n = 43$) Mean (SD)	Low-tech companies ($n = 83$) Mean (SD)	Significance
Adjusted R^2	0.248 (0.234)	0.290 (0.239)	0.035**

Note: **Significant at the 0.05 level

Table IV.
Two sample *t*-test

Variables	*Quant_IC*	*Qual_IC*	*FSI*	*SIZE*	*ROA*	*BETA*	*GRW*	*LEV*	*COV*
Panel A: Whole sample, n = 126									
Quant_IC	1								
Qual_IC	0.804***	1							
FSI	−0.102	−0.100	1						
SIZE	0.084	0.106	−0.047	1					
ROA	0.356***	0.330***	−0.017	−0.081	1				
BETA	−0.305***	−0.265***	0.118	−0.143	−0.496***	1			
GRW	0.373***	0.326***	−0.173*	0.018	0.314***	−0.457***	1		
LEV	−0.003	0.069	0.052	0.100	−0.202**	0.167*	0.033	1	
COV	0.107	0.097	−0.013	0.396***	0.107	−0.170*	0.034	−0.062	1
Panel B: High-tech companies, n = 43									
Quant_IC	1								
Qual_IC	0.505***	1							
FSI	−0.313***	−0.383***	1						
SIZE	0.308**	0.226	0.007	1					
ROA	0.325**	0.291**	−0.060	0.199	1				
BETA	−0.305**	−0.040	0.139	−0.113	−0.481***	1			
GRW	0.481***	0.273*	−0.127	0.089	0.243	−0.397***	1		
LEV	−0.187	−0.100	0.179	0.077	−0.139	0.407***	−0.069	1	
COV	0.441***	0.319**	−0.050	0.337**	0.232	−0.256*	0.164	0.012	1
Panel C: Low-tech companies, n = 83									
Quant_IC	1								
Qual_IC	0.814***	1							
FSI	0.069	0.060	1						
SIZE	0.036	0.079	−0.079	1					
ROA	0.242**	0.220**	0.043	−0.245**	1				
BETA	−0.153	−0.176	0.079	−0.185*	−0.443***	1			
GRW	0.251**	0.224**	−0.176	−0.004	0.305***	−0.440***	1		
LEV	0.130	0.221**	−0.069	0.135	−0.307***	−0.007	0.134	1	
COV	−0.084	−0.077	0.025	0.444***	−0.030	−0.078	−0.068	−0.154	1

Table V.
Correlation matrix

Notes: *, **, and ***represent significance levels of 0.10, 0.05 and 0.01 respectively

As shown in Table VI, the overall model for the regression equation is deemed satisfactory for the whole sample as well as for the two sub-samples, as all ratio chi-square ratio probabilities are statistically significant ($p < 0.000$).

The results in Table VI show a statistically significant negative association between financial statement informativeness (*FSI*) and IC disclosure (*Quant_IC*) in the whole sample (Panel A) and in the sub-sample of High-tech companies (Panel B). However, this association is not significant in the sub-sample of Low-tech companies (Panel B). These results therefore confirm, at least partially, our hypothesis that there is a substitutive relationship between financial statement informativeness and IC disclosure for USA companies, specifically those operating in High-tech sectors.

Our results may be explained in the following manner: When the financial statement informativeness is low, it is in the interest of the managers of companies, especially High-tech ones, to disclose information on their IC to mitigate the problem of distortion of their financial information due to the non-recognition of IC investments as assets by current accounting standards.

Table VI.
Poisson regression results (dependent variable: Quant_IC)

Equation A: $Quant\_ICi = \beta 0 + \beta 1\, FSLi + \beta 2\, SIZEi + \beta 3\, ROAi + \beta 4\, BETAi + \beta 5\, GRWi + \beta 6\, LEVi + \beta 7\, COVi + \mu i$

	Panel A			Panel B					
	Whole sample			High-tech companies			Low-tech companies		
Variables	β	Significance	Exp (β)	β	Significance	Exp (β)	β	Significance	Exp (β)
Intercept	N/A	0.000***	N/A	N/A	0.000***	N/A	N/A	0.000***	N/A
FSI	−0.078	0.040**	0.925	−0.340	0.000***	0.711	0.080	0.208	1.032
SIZE	0.033	0.000***	1.034	0.044	0.001***	1.044	0.059	0.000***	1.061
ROA	0.017	0.000***	1.017	0.014	0.000***	1.014	0.016	0.000***	1.016
BETA	−0.137	0.002***	0.872	0.085	0.290	1.088	0.041	0.476	1.042
GRW	0.002	0.000***	1.002	0.001	0.083*	1.001	0.002	0.000***	1.002
LEV	0.001	0.000***	1.001	0.001	0.753	1.001	0.001	0.000***	1.001
COV	0.003	0.021**	1.003	0.007	0.000***	1.007	−0.005	0.006***	0.995
Likelihood ratio chi-square		394.641			185.210			140.022	
Significance		0.000***			0.000***			0.000***	
N		126			43			83	

Notes: *, **, and ***represent significance levels of 0.10, 0.05, and 0.01 respectively

Regarding control variables, the results in Panel A and B of Table VII show that IC disclosure (*Quant_IC*) is positively and significantly associated with the company's size (*SIZE*), its performance (*ROA*), its growth (*GRW*) and its leverage level (*LEV*), respectively. Our results therefore confirm the majority of previous studies that the level of IC disclosure increases with the company's size (Bozzolan *et al.*, 2003; Oliveira *et al.*, 2006), its performance (Cerbioni and Parbonetti, 2007), its growth (Garcia-Meca *et al.*, 2005) and leverage levels (Gerpott *et al.*, 2008). The association between IC disclosure (*Quant_IC*) and the number of analysts following the company (*COV*) is also significantly positive in the whole sample (Panel A) and in the sub-sample of High-tech companies (Panel B). However, this association is significantly negative in the sub-sample of Low-tech companies (Panel B). According to these results, it seems that High-tech companies voluntarily disclose more information about IC outside financial statements when they are followed by a large number of analysts, while Low-tech companies disclose less information on IC when they are followed by a large number of analysts. This could be related to the costs of properties driven by strategic information disclosure and the close relationship between traditional companies and financial analysts who want to keep the information private. Finally, our results show a significantly negative association between IC disclosure (*Quant_IC*) and the company's risk (*BETA*), which is in line with the previous study by Garcia-Meca and Martinez (2007). This result therefore implies that the level of IC disclosure decreases when the company is risky.

6.3.2 Estimating equation B. The results of the Poisson regression regarding the relationship between the financial statement informativeness and the *quality* of IC disclosure appear in Panel A of Table VII for the entire sample and on Panel B for the two sub-samples (High-tech and Low-tech companies).

As seen in the Table VII, the overall model for the regression equation is deemed satisfactory for the whole sample as well as for the two sub-samples, since all ratio chi-square ratio probabilities are statistically significant ($p < 0.01$).

In accordance with our correlation analysis results (Table V), the results in Table VII show that the association between the financial statement informativeness (*FSI*) and IC disclosure (*Qual_IC*) is only significant in high-tech companies (Panel B). This statistically negative association therefore confirms, at least partially, our hypothesis that there is a substitutive relationship between financial statement informativeness and IC disclosure for US companies, particularly those operating in high-tech sectors. This result implies that IC disclosure is used as a solution to compensate for the poor financial statement informativeness in high-tech companies. In this sense, the more the financial statement informativeness is low in high-tech companies, the greater is the quality of their IC disclosure.

Regarding control variables, the results in Table VII show a significantly positive association between the IC disclosure (*Qual_IC*) and the company's performance (*ROA*), its growth (GRW) and leverage levels (*LEV*), respectively. Our results are therefore in line with the majority of previous studies that the quality of IC disclosure increases with a company's performance (Garcia-Meca *et al.*, 2005; Cerbioni and Parbonetti, 2007), its growth (Garcia-Meca and Martinez, 2007) and leverage levels (Gerpott *et al.*, 2008). The company's size (*SIZE*) is also positively associated with IC disclosure (*Qual_IC*) but it is only significant in low-tech companies (Panel B). However, neither company's risk (*BETA*) nor analysts' coverage (COV) appear to have a statistically significant association with IC disclosure (*Qual_IC*).

Table VII.
Poisson regression results (dependent variable: Qual_IC)

Equation B: $Qual\_ICi = \beta 0 + \beta 1\, FSLi + \beta 2\, SIZEi + \beta 3\, ROAi + \beta 4\, BETAi + \beta 5\, GRWi + \beta 6\, LEVi + \beta 7\, COVi + \mu i$

	Panel A			Panel B					
	Whole sample			High-tech companies			Low-tech companies		
Variables	β	Significance	Exp (β)	β	Significance	Exp (β)	β	Significance	Exp (β)
Intercept	N/A	0.000***	N/A	N/A	0.000***	N/A	N/A	0.000***	N/A
FSI	−0.061	0.278	0.941	−0.298	0.001***	0.742	0.077	0.154	1.017
SIZE	0.022	0.108	1.022	0.026	0.206	1.026	0.034	0.072*	1.035
ROA	0.010	0.000***	1.010	0.010	0.001***	1.010	0.006	0.109	1.006
BETA	−0.064	0.322	0.938	0.084	0.493	1.088	0.007	0.334	1.007
GRW	0.001	0.027**	1.001	0.001	0.301	1.001	0.001	0.071*	1.001
LEV	0.001	0.001***	1.001	0.001	0.147	1.001	0.001	0.012**	1.001
COV	0.001	0.491	1.001	0.004	0.108	1.004	−0.004	0.159	0.996
Likelihood ratio chi-square		63.235			37.734			23.066	
Significance		0.000***			0.000***			0.002***	
N		126			43			83	

Notes: *, **, and ***represent significance levels of 0.10, 0.05, and 0.01 respectively

7. Summary and conclusions

Motivated by recent recommendations of regulators and standard-setters (FASB, 2001; IASB, 2010; SEC, 2003; EFFAS, 2008; OECD, 2006a, 2006b, 2013; EC, 2011; etc.) regarding disclosure, this study adds to the debate about the determinants of the voluntary disclosure of IC information. Our primary research objective therefore was to empirically analyse the relationship between financial statement informativeness and IC disclosure.

By using a sample of 126 US companies in 2009, our results teach us a number of things. *First*, our results show that high-tech companies disclose more information in terms of quantity and quality of IC than low-tech companies. This result would seem to be due to the fact that high-tech companies have large investments in IC that do not appear in their financial statements given the lack of their accounting recognition as assets by current accounting standards. As a solution, these high-tech companies voluntarily disclose information on their IC to offset any shortcomings in financial information regarding IC and to better reflect the real value of the company and its ability to create future earnings.

Second, our results also show that the financial statement informativeness is lower in high-tech companies than in low-tech companies. This result would appear to be due to the current accounting standards in the USA that prohibit the capitalisation of most IC investments; hence, the distortion of the financial information of companies that invest heavily in IC.

Lastly, our results show a negative (substitutive) relationship between financial statement informativeness and IC disclosure in high-tech companies. This result means that when the financial statement informativeness is low, it is in the interest of the managers of high-tech companies to disclose information on their IC to mitigate the problem of distortion of their financial information due to the non-recognition of IC investments as assets by current accounting standards.

The results of this study may have several practical implications. *First*, they can serve as feedback to regulators and standard-setters to assess the current application of their proposed frameworks and guidelines for the voluntary disclosure of IC information and to empirically validate their theoretical statements. *Second*, they may encourage managers of companies, especially high-tech ones, to voluntarily disclose information on IC to compensate for the loss of relevance of financial information due to the lack of accounting recognition of IC as an asset in the financial statements. *Finally*, they can contribute to the current debate about the measurement of the quality of IC disclosure. Other researchers could, therefore, use the index developed in this study to assess the quality of IC disclosure.

Notes

1. Following the majority of previous research, our study is based on a single year, i.e. 2009, because disclosure policies for a company are considered relatively constant over the years (Botosan, 1997).
2. The names of the sample companies can be obtained from the authors upon request.
3. The annual report on the 10-K Form is the report required by the *Securities and Exchange Commission* (SEC) in the USA, which provides a full summary of the performance of the listed company. Although it has a similar name, the annual report on the 10-K Form is different from the classical report of the "annual shareholders' report" that a company must send to its shareholders when it holds its annual general assembly. Most US companies combine these two annual reports into one document. Taking the example of Jones (2007) and Francis *et al.* (2008), we conducted a content analysis of these two reports, as they both contain IC information on the company.

4. According to Milne and Adler (1999), the results of the Krippendorff's alpha test (also called Cronbach's alpha) are judged acceptable if they are above the minimum limit of 0.7.
5. The ERC has been criticised in the literature as being too narrow because it only measures the quality of earnings and ignores the quality of other financial information, such as the book value of equity, which may also have an effect on the company's market value (Lev *et al.*, 2005).
6. In the classical linear regression model, the dependent variable is expressed by a linear combination of explicative parameters under the assumption that the dependent variable has a normal distribution. However, when the variable is count data, it follows Poisson's Law. In this sense, the Poisson regression model is appropriate for dependent variables, which have a Poisson distribution.
7. As the IC disclosure variable (Quant_IC and Qual_IC) is count data, which does not take into account negative values, we used the *Mann–Whitney U* average difference test, which is a non-parametric test that does not require the normality of the variable under study.
8. As the variable for financial statement informativeness (*FSI*) is a metric variable (continuous), we used a parametric test, namely, the *Student's t-test* for mean difference.
9. When the correlation examined involves count data, Spearman's correlation coefficient is present. If this is not the case, where the correlation examined involves two metric variables (continuous), Pearson's correlation coefficient is present.

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Appendix

Human capital	Structural capital	Relational capital
1. Number of employees	1. Intellectual property	1. Customers
2. Employee age	2. Process	2. Market presence
3. Employee diversity	3. Management philosophy	3. Customer relationships
4. Employee equality	4. Corporate culture	4. Customer acquisition
5. Employee relationship	5. Organization flexibility	5. Customer retention
6. Employee education	6. Organization structure	6. CTE
7. Skills/know-how	7. Organization learning	7. Customer involvement
8. Employee work-related competences	8. Research & development (R&D)	8. Company image/reputation
9. Employee work-related knowledge	9. Innovation	9. Company awards
10. Employee attitudes/behavior	10. Technology	10. Public relation
11. Employee commitments	11. Financial dealings	11. Diffusion & networking
12. Employee motivation	12. Customer support function	12. Brands
13. Employee productivity	13. Knowledge-based infrastructure	13. Distribution channels
14. Employee training	14. Quality management & improvement	14. Relationship with suppliers
15. Vocational qualifications	15. Accreditations (certificate)	15. Business collaboration
16. Employee development	16. Overall infrastructure/capability	16. Business agreements
17. Employee flexibility	17. Networking	17. Favorite contract
18. Entrepreneurial spirit	18. Distribution network	18. Research collaboration
19. Employee capabilities		19. Marketing
20. Employee teamwork		20. Relationship with stakeholders
21. Employee involvement with community		21. Market leadership
22. Other employee features		

Source: Li *et al.* (2008)

Table AI.
IC categories and subcategories (items)

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Anis Maaloul is Professor of Accounting and Taxation at the School of Administrative Science, TELUQ University of Quebec and Postdoctoral fellow at the CPA Canada – Accounting and Governance Research Centre at TELFER School of Management, University of Ottawa. He is also member of the Chartered Professional Accountants (CPA) Order of Quebec. Dr Maaloul is particularly interested in topics related to the field of intellectual capital, disclosure of non-financial information, corporate reputation, risk management and international accounting. His latest research focuses on accounting, management, auditing, disclosure of information on intangible assets and their relevance to investors and financial analysts. Many of Dr Maaloul's publications have been recognized by the high quality of their scientific contribution, notably his article published in *The Journal of Intellectual Capital*, which was chosen as an Outstanding Paper Award Winner at the "Emerald Literati Network" Awards for Excellence in 2011. His article published in the *Accounting Forum* was also among the Most Downloaded Articles from ScienceDirect in 2012 and the Most Cited Articles from Scopus in 2014.

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