

**Research on Corporate Disclosure of Human Capital:  
An Analysis from the Decision-Usefulness Approach**

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## **Chapter 1: Introduction**

This thesis aims to consider corporate disclosure of human capital (HC) from the decision-usefulness approach. Corporate disclosure in this study includes both financial information and non-financial information<sup>1</sup>. Dividing the scope of information, I investigate the current practice and its implications for investors' decision making one by one. Through these considerations, I attempt to provide a guideline for corporate disclosure of HC in the present accounting environment.

Accounting research should ultimately contribute to fair economic resource allocation among all stakeholders. However, this study focuses on corporate disclosure of HC from the decision-usefulness approach and contributes to the discussion about corporate disclosure studies in the integrated reporting context.

Accounting researchers and related organizations discussed the limitations of traditional transaction-based accounting in the 1980s–90s<sup>2</sup>, when the financial and security instruments market (e.g. derivatives) developed significantly in the US. The main

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<sup>1</sup> In this study, I define non-financial information as all disclosed information that relates to corporate value but is not provided in the financial statements. For a detailed discussion about the concept of non-financial information, refer to Erkens et al. (2015).

<sup>2</sup> See Knutson (1993) for a detailed discussion.

criticism was the absence of information about the benefits and risks of off-balance transactions. Accounting standards for financial instruments, lease transactions, and others might provide information that transaction-based accounting missed. However, the rapid rise of information and communications technology (ICT) has changed the business environment dramatically since the late 1990s<sup>3</sup>. Accordingly, some accounting researchers have discussed the limitations of financial statements in terms of intangibles. Once again, the main criticism was the absence of information about the benefits and risks of off-balance economic events. Since the concept of intangibles encompasses a broad range of subjects, this study chiefly sheds light on HC as the source of the value-creation process (Nonaka and Takeuchi, 1995).

The American Accounting Association published the *Statement on Accounting Theory and Theory Acceptance* in 1977. According to the document, the decision-usefulness approach considers which decision models are used and who the assumed decision makers are. Accounting information users include investors, creditors, employees, government, and other stakeholders. It is almost impossible to satisfy every need of each stakeholder. However, by providing accounting information in response to investors or creditors' needs, managers can discharge their accountability, because

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<sup>3</sup> See Knutson (1993) for a detailed discussion.

although all stakeholders' needs are not the same, they are similar to those of investors or creditors. This premise might not hold for certain information, but I begin my investigation from the investors' point of view, because the practice of disclosing HC is currently not well established.

Decision models also vary from one investor to another, and there is a strong possibility that investors may misunderstand the models. Since exploring decision models is not the aim of this study, I do not introduce or criticize them in this thesis. However, prevailing valuation models—the discounted dividend model, discounted cash flow model, and residual income model—ultimately rely on the prediction of future cash flow and discount factors. Disclosing information about economic events that generate future cash flow should be relevant information. Therefore, whether information relates to predicting the entity's future cash flow or not is set as the criterion for decision usefulness.

Through this thesis, I consider the following research agendas:

**【RA1】** How has the topic of accounting for HC changed in terms of external reporting, and what empirical evidence on HC disclosure do we have, in particular for the decision-usefulness approach?

**【RA2】** Why do most accounting regimes not allow managers to capitalize investments in HC, and what information about HC is missing from financial statements?

**【RA3】** What is the impact on investors of non-financial HC disclosure?

**【RA4】** How do managers disclose HC information to reduce the information asymmetry between investors and managers?

**【RA5】** To whom do managers voluntarily disclose non-financial HC information in integrated or annual reports?

**【RA6】** How should managers disclose information of HC to investors in forms of financial and non-financial information within the framework of integrated reporting?

I examine both financial and non-financial HC disclosure comprehensively by investigating each research agenda. Through the investigation, I analyse a controversial topic further when necessary. I interpret each investigation coherently from the decision-usefulness approach to achieve my purpose.

Chapter 2 is a literature review of HC accounting research. First, I explore previous studies up to the present. The chronological review demonstrates how the topic of accounting for HC has changed in terms of external reporting (RA1). Then, I summarize the empirical evidence about the impact of HC disclosure on investors through a systematic review that focuses on empirical studies (RA1). Finally, I critique previous literature and derive a future research agenda that is partly addressed in later chapters.

The term ‘human capital’ commonly appears in both academia and practice, but there are several concerns about HC’s classifications and levels. Chapter 3 starts by investigating the historical transitions in the concept of HC. As studies of HC include accumulated interdisciplinary research in areas such as accounting, economics, management, or psychology, reviewing the concepts is crucial for clarifying the scope of this chapter. Although this thesis focuses on issues in accounting, the starting definitions should not vary among different fields.

Then, I investigate why current financial statements do not report HC as assets except in special circumstances (RA2). As HC is recognized as an intangible, I first look at the accounting standards for intangibles. Measurement and recognition issues are inevitable for recognition of HC as an asset. The discussion of capitalization or recognition as an expenditure is a traditional topic in accounting for intangibles (Lev and Zarowin, 1999; Wyatt, 2008). However, in this chapter, I focus on and attempt to find a feasible way to report HC in financial statements.

In the current disclosure environment, financial statements are not the only medium that conveys information about an organization. Other media, such as websites, annual reports, news articles, analyst reports, or television, play significant roles in companies’ disclosures. In the early 2000s, governments in northern European countries and Japan



released guidelines for IC reports to promote voluntary IC disclosure. Chapter 4 studies the impact of initiating IC disclosure in standalone reports in the financial market. Statistical evidence on how to initiate HC disclosure was obtained through this analysis (RA3 and RA4).

To verify a consolidated theory developed in the IC literature (RA5), Chapter 5 investigates the association between the amount of voluntary HC disclosure and the company's profile, including required HC and accounting information. It also verifies the value-relevance of voluntary HC information found in previous literature. This research uses a stratified random sample from the Tokyo Stock Exchange to conduct regression analysis and graphical modelling. Content analysis of annual reports is conducted using text-mining software to quantify the amount of qualitative HC information.

Chapter 6 comprehensively summarizes the findings of the previous chapters and suggests a guideline for HC disclosure, including a voluntary disclosure strategy (RA6).

## **Chapter 2: Brief History of Accounting for Human Capital**

### **1. Origins in the US**

*In the business enterprise, a well-organized and loyal personnel may be a more important “asset” than a stock of merchandise [. . .] At present, there seems to be no way of measuring such factors in terms of the dollar; hence, they cannot be recognized as specific economic assets. But let us, accordingly, admit the serious limitation of the conventional balance sheet as a statement of financial condition (Paton, 1922: pp.486-487)*

Almost a century ago, Paton (1922) intuitively considered that traditional financial statements do not precisely describe the value of employees, and yet the issue of whether an individual or group of personnel should be recognized as assets is still controversial.

Deductive theorists in this period argued the concept of income or profit, as well as how to measure assets and liabilities. Those studies assumed different users or uses of financial statements and suggested various measurement attributes, such as discounted future cash flow, market price, replacement cost, and historical cost, depending on user, use, or marketability (Alexander, 1950; Canning, 1929; Edwards and Bell, 1961; MacNeal, 1939; Moonitz, 1961; Sweeney, 1936).

Revision of the Accounting and Reporting Standards for Corporate Financial Statements released by the American Accounting Association in 1957 and Sprouse and

Moonitz (1962) defined assets slightly differently, but both defined them as the right to claim expected future economic benefits resulting from past and present transactions. This concept of assets and various measurement approaches established the theoretical foundation for discussions about recognition and measurement of HC in financial statements<sup>4</sup>.

In the development period of the 1920s to 1960s, some accounting literature in the US regarded employees as assets, and the valuation of employees was of central interest (Roslender, 2009). Hermanson's (1964) challenging study suggested two approaches—the adjusted present value method and unpurchased goodwill method—to evaluate human assets<sup>5</sup> as a part of unpurchased goodwill. However, these approaches have several problems. For instance, in previous studies, employees are considered as a part of intangibles, but these methods assume that employees dominate all intangibles. Therefore, the valuation results should be overstated.

Brummet et al. (1968) also considered human resources as assets<sup>6</sup> and introduced

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<sup>4</sup> A detailed discussion about this point is presented in Chapter 3.

<sup>5</sup> The term 'human asset' is not well defined in Hermanson (1964); however, based on the methods, it can be assumed that it is something that is not recognized in financial statements but that generates excess earnings.

<sup>6</sup> In Brummet et al. (1968), the term 'asset' does not have the same definition as in the current conceptual framework released by the Financial Accounting Standards Board (FASB). They focus on deferring the expenditure for human resource investment to match it to its outcome, more like a type of deferred asset.

various measurement methodologies. They then suggested that accounting for human resources can be utilized not only for financial reporting but primarily as a management tool. In the following year, Brummet et al. (1969) reported an experimental application of a human resource accounting system as a managerial tool in R. G. Barry Corporation and emphasized its increasing managerial effectiveness in various human resource contexts.

In the 1960s, another approach for studying the management of employees was the application of organization theory. This approach attempted to identify the relationship between causal variables (managerial behaviour or organizational structure), intervening variables (perception, communication, motivation, decision making, etc.), and end-result variables (health and satisfaction, productivity, and financial performance) (Likert and Bowers, 1969). Hence, its major concern lay with identifying which employee-related index affected financial performance, rather than the value of employees in monetary terms.

## **2. Human resource accounting**

Studies on accounting for employees were actively conducted worldwide in the 1970s. A review study by Flamholtz (1974) referred to the studies at that time as focusing on Human Resource Accounting (HRA), which was defined as the process of identifying, measuring, and communicating information about human resources to decision makers.

HRA can be regarded as accounting for both internal and external use, but its purpose changed as the study progressed.

Flamholtz (1971) attempted to measure the value of an employee stochastically based on the cash inflow the employee could produce in the future. The characteristics of Flamholtz's (1971) model can be summarized as follows: 1) An individual's value to an organization is measured by the individual's future services, and 2) the movement of people among organizational roles is a stochastic process with service rewards.

On the other hand, Lev and Schwartz (1971) suggested an alternative method for stochastically measuring the value of an employee based on the employee's future compensation. In contrast to Flamholtz's (1971) model, Lev and Schwartz's (1971) model evaluates an employee's individual economic value by discounting the employee's future compensation (cash outflow) to its present value with a mortality rate.

Morse (1973) combined the models of Flamholtz (1971) and Lev and Schwartz (1971) into one. The values calculated by Flamholtz (1971) and Lev and Schwartz (1971) were called 'human resource' and 'human capital' (hereafter, HC)<sup>7</sup>, respectively. Morse (1973) claimed that the difference between human resource and HC was the 'human asset'.

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<sup>7</sup> The term 'human capital' used in Morse (1973) is different from the definition of HC used throughout this paper.

Theoretically, Morse's (1973) approach may be similar to goodwill<sup>8</sup> of employees in the current sense, but the most difficult (or almost impossible) part of this model is probably the expected cash inflow in Flamholtz's (1971) model.

Cooper and Parker (1973) theoretically examined how to treat employees in financial statements. They considered whether the value of an employee satisfies the definition of an asset, concluding that it does offer information complementary to the financial statements and that historical cost is the appropriate measurement method. Jauch and Skigen (1974) also critically evaluated the capitalization of employees on the balance sheet and did not support capitalization for external reporting purposes. After critical evaluation, some researchers realized the limitations of HRA, especially for external reporting. Baker (1974) indicated the possibility of income manipulation when HRA is utilized.

Moreover, the 1970s was a period when empirical studies on the theory of HRA were also actively carried out. Some of these studies showed experimentally that information on human resources affects investment decisions (Acland, 1976; Elias, 1972; Hendricks, 1976; Schwan, 1976). According to Schwan (1976), inclusion of HRA information results

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<sup>8</sup> Goodwill here does not mean the same as goodwill on the balance sheet, but it refers to intangible resources that generate excess earnings.

in significantly better estimation of a firm's net income. The study revealed the awareness of financial professionals against HRA, but how to evaluate managers or employees or incorporate them into valuation remained uncertain.

On the other hand, Flamholtz (1973) investigated what role HRA can play in the framework of corporate social responsibility and social accounting. The author suggested that HRA might enable managers to better conceptualize and measure the management of employees for a business organization's decision making. Furthermore, some studies applied HRA experimentally to various organizations and claimed that the expansion of the human resource function or measurement of relevant variables (e.g. training and development cost) should contribute to management decisions (Dobbins and Trussell, 1975; Friedman and Lev, 1974; Gambling, 1974). Flamholtz (1976) further conducted an empirical study that divided the variable into monetary and non-monetary indicators and showed evidence that non-monetary indicators can affect management decisions.

Lau and Lau (1978) discussed two different methods for human resource depreciation; one uses expected value and is considered for managerial use, while the other uses a probabilistic and more conservative value and is considered for external reporting. The authors concluded that human resource capitalization is statistically meaningful for decision making only if employees are treated homogeneously.

### **3. Human resource costing and accounting**

In the 1980s, academia's interest in accounting for employees faded (Roslender, 2009), partly because most theoretical and empirical studies at the fundamental level seemed to have been exhausted. However, some researchers or practitioners focused on more practical issues of application and implementation in this period. For instance, Flamholtz (1987) reported a case study of HRA application to estimate and manage the value of employees in a financial brokerage firm. In addition, in his second edition of *Human Resource Accounting*, published in 1985, he added a new section that explained how to apply and implement HRA systems in an organization. However, the explanation was supposed to serve as a framework to facilitate line management's decision making and was not specifically intended for external reporting purposes<sup>9</sup>. This trend can be observed until the mid-1990s (e.g. Dawson, 1994; Maher, 1996; Morrow, 1996; Vakharia, 1995).

### **4. The first and second generation of intellectual capital**

In the mid-1990s, information and communications technology (ICT) changed the global economy dramatically. The importance of intangibles in the value creation process

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<sup>9</sup> The purpose of information for internal use is to improve the performance of the organization, while that for external reporting is chiefly to support expected future cash flow. Some part of the information cannot be classified into the former or the latter based on its purpose, but what information managers voluntarily disclose is a different problem from what information they should obtain for their own decision making.



increased within business enterprises and society (Lev and Zarowin, 1999). Traditional tangible assets and financial instruments remained highly important, but relative to intangibles, they were in decline, particularly for high-tech companies (Roslender, 2009). The change in the economic environment raised the interest in intangibles among accounting researchers.

Several researchers found empirical evidence of a link between the decreasing relative importance of accounting numbers and limitations of financial statements (Gröjer and Johanson, 1997; Lev and Zarowin, 1999). In particular, Gröjer and Johanson (1997) found that an increasing dependence on the labour force leads to higher abnormal returns and stated that the accounting treatment of investment in employees is not precisely reflected in the financial statements<sup>10</sup>.

Terminology such as intellectual capital (IC), intangibles, or knowledge assets were used interchangeably in late 1990s. According to Lev (2001), intangibles that are not recognized on the balance sheet play an increasingly important role in business. Thus, financial statements without information about intangibles do not provide sufficient

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<sup>10</sup> It is possible to regard the evidence as showing that share prices have incorporated the information on the relatively higher dependence on investment in employees. In that case, the conclusion might be the opposite of that of Gröjer and Johanson (1997). Whether the evidence supports their claim should be considered carefully.

information for stakeholders' decision making. Disclosing information about intangibles can be regarded as necessary to compensate for the limitation of financial statements.

The most important concern in the early stage was how to develop a useful taxonomy of IC's constituents. The prevailing taxonomy during this period identified three components: HC, structural capital, and relational capital (Lynn, 1998; Meritum, 2002; Mouritsen, 1998). The definition of each classification is as follows:

- **Human capital:** knowledge that employees take with them when they leave the firm
- **Structural capital:** knowledge that stays within the firm at the end of the working day
- **Relational capital:** all resources linked to the external relationships of the firm with customers, suppliers, or R&D partners

In this period, HC was clearly defined and classified as a part of intellectual capital or intangibles. Meritum (2002; p.10) further illustrated that HC includes '*the knowledge, skills, experiences and abilities of people*'. Some of these constituents are specific to the individual, but others may be generic. Further detailed examples are '*innovation capacity, creativity, know-how and previous experience, team work capacity, employee flexibility, tolerance for ambiguity, motivation, satisfaction, learning capacity, loyalty, formal training and education*' (Meritum, 2002). After this project, the main issue of HC

disclosure shifted in some developed countries from recognition and monetary measurement in financial statements to non-financial information supported by key performance indicators (KPIs) in annual or stand-alone reports<sup>11</sup>.

For the framework of non-financial IC disclosure, the scoreboard approach<sup>12</sup> prevailed successfully in early 2000s. The balanced score card (Kaplan and Norton, 1992), intangible asset monitor (Sveiby, 1997), and Skandia Navigator™ (Edvinsson and Malone, 1997) provided fundamental concepts. Meritum (2002) conducted an EU sponsored research project, introducing the approaches and affecting other governmental guidelines such as the Danish guidelines (Danish Ministry of Science, Technology and Innovation, hereafter DMSTI, 2003) or Japanese IC reporting guidelines (Ministry of Economics, Trade, and Industry, hereafter METI, 2004).

## **5. The third generation of intellectual capital**

How to disclose information about IC is still a controversial topic. The International Accounting Standards Board (IASB) has deferred a project on intangibles since December 2007. In fact, there are numerous different disclosure options to consider, such

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<sup>11</sup> For instance, the Japanese Ministry of Economy, Trade and Industry (METI) published guidelines on IC reporting in 2004 and 2005. These guidelines encouraged managers to disclose their companies' IC in narrative form supported by KPIs (see Chapter 4).

<sup>12</sup> In the scoreboard approach, managers disclose various identified components of IC and their indicators or indices in a scorecard or graph, sometimes with explanations.

as capitalization vs. expenditure, financial vs. non-financial, compulsory vs. voluntary, and so on. In addition, what comprises IC has not yet been identified. In fact, the concept of intangibles itself is too broad to treat as one object.

Although what knowledge as a whole consists of is unclear, Nonaka and Takeuchi (1995) theoretically described HC as the source of the knowledge creation process. Therefore, information about HC should be crucial for investors' decisions. Some researchers further claim that HC is disclosed not only for investors, but also for other stakeholders such as employees or the government. In the IC disclosure theory of An et al. (2011), disclosure of HC is equally important from a societal point of view. Moreover, as seen in previous sections, organizational leaders should consider their employees as their most important resource when they make decisions (Fulmer and Ployhart, 2014). Thus, disclosure and management of HC is a highly relevant issue in both theory and practice.

## **6. Empirical evidence about the impact of HC disclosure on investors**

This section summarizes the empirical evidence<sup>13</sup> about the impact of HC disclosure

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<sup>13</sup> The articles investigated here were collected using the following procedure. First, I looked for articles mentioned in the previous review articles (Flamholtz, 1974 and 1999; Fulmer and Ployhart, 2014; Roslender, 2009; Theeke, 2005; Wyatt and Frick, 2010). Then, I searched for other related articles in Google Scholar using the keywords ('Human capital', 'Human resource', 'Employee', and 'Human asset'). Finally, I read the abstract to manually select the literatures on investors' decisions.

on investors by listing the results of each empirical study on the relationship between HC information and investors' decisions.

■insert Table 2-1 here■

As explained in section 2, accounting researchers in the 1970s were concerned with whether human resources should be capitalized, as well as how to measure them. However, in practice, financial statements normally do not include HC on the balance sheet as an asset. To provide empirical evidence showing that HC information on the balance sheet has an impact on investors' decisions, researchers used an experimental approach and introduced fictitious financial statements to subjects that included capitalized HC investments. These researchers reported that capitalized HC investments affected the decisions of investors (those who can understand the meaning of HC investment) (Acland, 1976; Elias, 1972; Hendricks, 1976; Schwan, 1976).

After the mid-1990s, most studies took advantage of archival data and statistical software because of advancements in ICT. At first, information available in financial information databases was the focus of value-relevance studies (e.g. Ballester et al., 2002; Bell et al., 2002). Then, with the proliferation of non-financial disclosure in practice, the scope of empirical studies on HC information expanded to non-financial information. Gamerschlag (2013) transformed qualitative HC information into quantitative

information by counting the number of keywords in annual reports and found a relationship between disclosure and share price in the long term.

The empirical evidence previously obtained provides the basis for discussion of the decision-usefulness approach. Capitalized investments of HC, such as the unexpired portion of the costs of recruiting, hiring, training, familiarization, and development of the company's personnel had impacts on investors' decisions in many experimental studies (Elias, 1972; Hendricks, 1976; Schwan, 1976). Total and subdivided labour costs such as wages and employee stock options have associations with market-based values (e.g. Ballester et al., 2002; Bell et al., 2002; Hansson, 2004; Lajili and Zeghal, 2006).

Firms also voluntarily disclose non-financial information in their annual reports, sometimes using a different name such as sustainability reports or integrated reports. The impacts of non-financial information are not the same as those of financial information, but some studies provided evidence that non-financial HC information has certain associations with investors' decisions (Acland, 1976; Gamerschlag, 2013; Lim et al., 2009). For instance, Gamerschlag (2013) reported that non-financial information about qualifications and competence relate to long-term market value.

## **7. Critique and future research agenda**

Previous studies on HC information in the financial statements have argued whether HC should be capitalized or amortized and how to measure it as an item on the balance

sheet. Experimental studies also provided some evidence showing that capitalized HC information does affect investors' decisions. On the other hand, in the context of financial statements, it is essential to establish normative viewpoints about how to measure financial performance before discussing the detailed treatment of HC in financial statements. In Chapter 3, normative models are introduced for measuring firms' financial performance and the treatment of HC in financial statements is investigated based on the models.

Empirical studies focusing on non-financial HC information are scarce. However, HC disclosure practice has been gradually occurring since the mid-2000s, and sufficient archival data related to non-financial HC information has accumulated. Therefore, there are many opportunities to carry out empirical studies on this topic.

Gamerschlag (2013) observed the association between share price and the amount of non-financial HC information. Previous studies did not examine the impact of initiating HC disclosure or HC information in the context of value creation (together with other resources such as structural capital or relational capital). Chapter 4 addresses these issues to provide new empirical evidence.

Further, previous studies did not reveal the structure among the related HC variables. It is possible that some studies examining the association observed an indirect relationship

because of inappropriate control variables or methodologies. In Chapter 5, I identify the complicated structure of each HC-related variable, including HC disclosure, accounting numbers, and share price, using a covariance structure analysis, so that I can deeply understand the impact of HC disclosure on investors. Further, I also illustrate managers' motivation for voluntary HC disclosure.



**Table 2-1: Value-relevance studies on HC information**

Authors	Year	Title	Methodology	Value-relevant HC information
Nabil Elias	1972	The Effects of Human Asset Statements on the Investment Decision: An Experiment	Experimental	Capitalized unexpired portion of the costs of recruiting, hiring, training, familiarization and development of personnel of the company
Derek Acland	1976	The Effects of Behavioural Indicators on Investor Decisions: An Exploratory Study	Experimental	Organizational environment Employee moral Management achievement motivation Employee consentaneity with system Managerial job satisfaction
James A. Hendricks	1976	The Impact of Human Resource Accounting Information on Stock Investment Decisions: An Empirical Study	Experimental	Capitalized unexpired portion of the costs of recruiting, hiring, training, familiarization and development of personnel of the company
Edward S. Schwan	1976	The Effects of Human Resource Accounting Data of Financial Decisions: An Empirical Test	Experimental	Capitalized operating costs incurred for human resources - primarily recruiting, relocation, development and training costs. + 5 year amortization.
Bo Hansson	1997	Personnel Investments and Abnormal Return: Knowledge-based Firms and Human Resource Accounting	Archival	Wage Cost Average Wage
Martha Ballester, Joshua Livnat, and Nishi Shinha	2002	Tracks labor cost and investments in human capital	Archival	Labour cost data
Timothy B. Bell, Wayne R. Landsman, Bruce L. Miller and Shu Yeh	2002	The Valuation Implications of Employee Stock Option Accounting for Profitable Computer Software Firms	Archival	Employee stock options
Bo Hansson	2004	Human capital and stock returns: Is the value premium an approximation for return on human capital?	Archival	Total wage paid Number of employees Average wage

Authors	Year	Title	Methodology	Value-Relevant HC information
Kaouthar Lajili and Daniel Zeghal	2005	Labor cost voluntary disclosures and firm equity values: Is human capital information value-relevant?	Archival	Labour cost Labour productivity (Total sales over the number of employees) Labour efficiency (difference between labour productivity and average labour cost)
Kaouthar Lajili and Daniel Zeghal	2006	Market performance impacts of human capital disclosures	Archival	Labour cost Labour productivity (Total sales over the number of employees) Labour efficiency (difference between labour productivity and average labour cost)
Lynn L. K. Lim, Christopher C. A. Chan, and Peter Dallimore	2009	Perceptions of Human Capital Measures: From Corporate Executives and Investors	Questionnaire	Value added by employees Composition of staff Staff turnover Average years of experience Average age of management and operational staff
Ramin Gamerschlag	2013	Value relevance of human capital information	Archival	Qualification(long term investment decision only) Competence(long term investment decision only)

## **Chapter 3: Treatments of Human Capital in Financial Statements**

### **1. Introduction**

#### ***1-1. Definition of human capital***

The term ‘human capital’ (hereafter HC) was probably first discussed in an economics book written by Arthur Cecil Pigou in 1928: ‘*There is such a thing as investment in human capital as well as investment in material capital*’. A few decades later, in the neoclassical economics literature, the term was used as an asset (in accounting) similar to physical means of production; that is, additional investment in HC yields more productivity, and it is said to be substitutable but different in that it is not transferable like other fixed assets (Becker, 1964; Mincer, 1957).

In accounting literature, Lev and Schwartz (1971) were the earliest to clarify the concept of HC. They regarded the discounted value of future payments to employees as HC, because it represents the interests of the employees (Morse, 1973). On the other hand, the discounted value of future cash inflow generated by employees’ service was considered as ‘human resource’ (Flamholtz, 1971). Morse (1973) defined ‘human asset’ as the difference between human resource and HC. His work attempted to keep the previous terminologies related to the value of employees in order; however, most subsequent works used these terms arbitrarily until HC was defined as a part of intellectual capital (IC) in the late 1990s.

In late 1990s, IC (or sometimes intangibles) was frequently discussed among accounting researchers to extend the idea of financial reporting beyond traditional financial reporting. Although classifications of IC reporting differ slightly among authors, they typically consist of three dimensions: HC, organizational capital, and customer capital (Mouritsen, 1998); HC is recognized as a part of IC.

Stewart (1997) defined HC as something in a business organization that thinks. In his own words, '*[The] primary purpose of human capital is innovation —whether of new products and services, or of improving in business processes*' (Stewart, 1997, p.86).

Further, Edvinsson and Malone (1997) explained that HC is comprised of combined knowledge, skill, innovativeness, and ability of a company's individual employees.

Sveiby (1997) suggested a similar classification but gave it a different name: employee competence. '*Employee competence involves capacity to act in a wide variety of situations to create both tangible and intangible assets*' (Sveiby, 1997, pp.10-11).

Meritum (2002), a research project founded by the European Commission to introduce a guideline for disclosing IC information, summarized the ideas from prior literature and classified IC into HC, structural capital (SC), and relational capital (RC).

The guideline defined HC as '*the knowledge that employees take with them when they leave the firm*' (Meritum, 2002, p.10). It also provided examples such as '*innovation*

*capacity, creativity, know-how and previous experience, teamwork capacity, employee flexibility, tolerance for ambiguity, motivation, satisfaction, learning capacity loyalty, formal training and education*'.

A decade later, HC has been treated in the framework of integrated reporting published in 2013. As described in the framework, integrated reporting aims to '*enhance accountability and stewardship for the broad base of capitals (financial, manufactured, intellectual, human, social and relationship, and natural) and promote understanding of their interdependencies*' (International Integrated Reporting Committee, hereafter IIRC, 2013, p.12). However, this guideline does not formally define each capital; rather it exemplifies items that might be included in each one.

HC normally includes knowledge that belongs to employees, but sometimes a question arises about whether managers' knowledge should be included in HC. Mackey (2008) empirically showed that 23.8% of the volatility of profitability performance can be explained by the fixed effect of the CEO. It may be true that managers have a significant impact on corporate value, but Mackey (2008) implies that the impact can be considered independently. Therefore, this study assumes that the value of managers is different from the definition discussed in most previous literature. The latest and most prevailing definition of HC in Meritum (2002) is followed in this thesis and the focus is

limited to employees' knowledge.

***1-2. Why should we consider accounting for HC in financial statements?***

Some companies in developed economies have already implemented disclosure of HC information in their annual or standalone reports in the form of qualitative information or key performance indicators. Roslender (2009, p.150), for example, described the situation as *'[w]ith the emergence of the intellectual capital concept, the possibilities for accounting for people in ways so far removed from what most people would recognise as accounting have suddenly become much more evident'*.

However, some previous accounting studies revealed that recognizing the information on the balance sheet is more value-relevant than disclosing the information in footnotes (Ahmed et al., 2006; Davis-Friday et al., 1999; Yu, 2013). Although the disclosure of HC information is currently moving forward, the question of whether to recognize HC on the balance sheet as an asset remains.

In previous literature, researchers have discussed the treatment of HC in financial statements based on different implicit or explicit normative accounting models. In section 2, two practical and comparative accounting models are explicitly explained: the net income model (NIM) and the book value of net assets model (BNM). In section 3, the ideal accounting treatments of HC in financial statements based on the NIM are illustrated

and the differences between ideal and current practices are described. Similarly, in section 4, the ideal accounting treatments of HC based on the BNM are shown, and the differences between ideal and current practices are investigated. Section 5 indicates what information about HC is missing in financial statements. Section 6 presents a conclusion on the treatment of HC in financial statements.

## **2. Net income model and book value of net assets model**

FASB (1976) introduced two fundamental accounting measurement models: the revenue and expense view and the asset and liability view. The revenue and expense view measures revenues and expenses and provides timing for their recognition to match efforts (expenses) and accomplishments (revenues) for a period (FASB, 1976, pars. 49-50). On the other hand, the asset and liability view calculates periodic income based on the definitions of assets and liabilities (FASB, 1976, par.54). Fujii (1997) compared the two conceptual models theoretically. The comparison was particularly effective for considering the treatment of financial instruments in financial statements (Tokuga, 2012).

However, the asset and liability view is ambiguous as to when, to what extent, and how future cash flow can be incorporated into asset evaluation (Tokuga, 2012). Its scope of application was not explicit: in other words, whether it aims to recover the reality of stock in traditional transaction-based balance sheets or to evaluate all the assets on the balance sheet. In addition, the asset and liability view is not related to certain

measurement attributes, while the revenue and expense view is strongly linked to historical cost measures. Therefore, I propose that the BNM is a clearer model than the asset and liability view or the corresponding NIM, which represents the revenue and expense view.

Since the economic value of a company under the BNM represents the discounted present value of total future cash flow produced by a company, the company recognizes all the resources on the balance sheet at their fair value (Tokuga, 2012). However, under the NIM, recognized transaction flows during an accounting period are allocated to the periodic income calculation using the matching principle, and revenues and expenses that are not allocated to the current period are recognized on the balance sheet as deferred assets or liabilities (Tokuga, 2012). In addition, even if cash flow has not yet occurred, income and expenses considered to be attributable to the current accounting period are included in the income calculation, and are simultaneously recognized as assets or liabilities (Tokuga, 2012). Although these models are different comparative models, Ohlson and Zhang (1998) and Penman (2007) explained theoretically that either NIM or BNM will suffice for equity valuation.

Tokuga (2012) explained the two interpretations for the mixed accounting model that current accounting standards and practice adopt. One interpretation is that the current



mixed accounting is a modification/reinforcement of the NIM after evaluating a part of assets and liabilities at their fair value. In other words, this interpretation keeps the current situation as a process for modification and sophistication of the NIM.

The other interpretation is that the current mixed accounting is already in the process of a paradigm shift towards the BNM. In this view, it is desirable to evaluate all assets and liabilities at their fair value; however, there are concerns about the objectivity or feasibility of fair value measurement for some assets and liabilities (e.g. internally generated goodwill and financial liabilities).

I describe the current HC treatment in the financial statements from both interpretations and predict a future direction to improve the current situation.

### **3. Mixed accounting as a modification/reinforcement of NIM**

Expenditures related to HC include acquisition expense, training expense, employee salary or wage, employee benefits, and retirement expense. The NIM ideally requires managers to allocate these expenditures as current expenses or deferred assets using the matching principle. There is a need to consider how managers can practically create a boundary between capitalizing and expensing.

Samudhram et al. (2008) considered this issue analytically and suggested that the expenditures of HC that occur within the control of an organization and generate economic benefits over several periods are suitable for capitalization. Therefore, this

approach recognizes the long-term expense of HC as a deferred asset to match the expense to its future revenue.

However, Samudram et al.'s (2008) approach has several defects. First, the amount of investment in HC might not always represent its real value. For example, the expense for acquiring a group of new graduates can be measured by acquisition cost, but this measure does not necessarily represent the new employees' future contributions. Second, the boundary between deferred assets and immediate expense is ambiguous, particularly for HC. In fact, it is almost impossible for managers to predict whether employees use their knowledge (HC) in the year they are acquired or use it later. Third, amortizing the asset to match the expenditure to its income brings other uncertainties regarding the number of periods of benefit and the residual value.

If mixed accounting from the current accounting standards is considered as a modification/reinforcement of the NIM, then HC expenditures are mostly recognized as expenses of the current period because of the ambiguity in the boundary between the short term and long term and in matching expenses with revenues.

However, there are some exceptional cases. One case is the expenditure to acquire professional sports players, which is required to be capitalized, amortized, and undergo an impairment test (UEFA, 2015). The legal and economic realities differentiate

professional sports players (e.g. football players) from other human resources (Amir and Livne, 2005; Maglio and Rey, 2017; Morrow, 1996). First, players have no contractual right to resign or give their notice. Second, the fees are paid to transfer a player's registration with the league from one club to another. Third, there are specific terms of re-employment placed on clubs by football regulatory bodies that are not applicable in other areas (Morrow, 1996: p.79).

Another case relates to personnel expenses included in R&D expenditures in the development phase that satisfy the criterion of International Accounting Standard (IAS) 35, paragraph 57. In particular, pharmaceutical companies capitalize R&D expenditures at cost and amortize them for a finite period.

As presented in Chapter 2, experimental studies in the 1970s supported capitalizing and amortizing HC expenditures. In the late 1990s, archival studies on the decision usefulness of capitalizing R&D and other related intangible expenditures (e.g. Aboody and Lev, 1998; Amir and Lev, 1996; Green et al., 1996; Lev and Sougiannis, 1996) provided similar evidence that capitalizing and amortizing intangibles possibly provide more value-relevant results.

#### **4. Mixed accounting as a process for a paradigm shift towards BNM**

The BNM recognizes all resources that generate future cash flow for the firm as assets or liabilities, and measures them at their fair value. Theoretical studies that

implicitly or explicitly assumed the BNM suggested that the value of HC is the difference between the discounted present value of future cash inflows that employees' services generate and the discounted present value of future cash outflows that the firm uses to reward its employees (Flamholtz, 1971; Lev and Schwartz, 1971; Morse, 1973).

In practice, however, the approved accounting standards define assets and liabilities. When considering why HC is not normally treated as an asset, the first step is to examine whether HC satisfies the definition of an asset or liability. Then, the recognition criteria are investigated to understand the current situation and predict possible future practice.

#### ***4-1. The definition of (intangible) assets***

IAS 38<sup>14</sup> defines an intangible asset as '*an identifiable non-monetary asset without physical substance*'. Therefore, I consider whether HC satisfies the definition of an asset and is identifiable, because it is, by definition, non-monetary and without physical substance.

IAS 38 defines an asset as '*a resource: (a) controlled by entity as a result of past events and (b) from which future economic benefits are expected to flow to the entity*'. HC is generally not controlled by the entity but by employees themselves, so it does not

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<sup>14</sup> I investigate IAS 38 rather than Statement of Financial Accounting Standard 142, because I illustrate the change in the exposure draft of the conceptual framework (IASB, 2015).

satisfy condition (a) (IAS 38, Item 15). However, if we consider the contract between the entity and an employee, the contract belongs to the entity [satisfying condition (a)] and generates future economic benefits through employees' labour or service [satisfying condition (b)]. Hence, it is possible to regard employment contracts, which indirectly represent HC, as assets.

IAS 38 further clarifies that an asset is identifiable '*if it either (a) is separable, ie is capable of being separated or divided from the entity and sold, transferred, licensed, rented or exchanged...; or (b) arises from contractual or other legal rights, regardless of whether those rights are transferable or separable from the entity or from other rights and obligation*'. Skinner (2008) indicated that intangibles are different from tangible assets in terms of the characteristics that they are '*not separate, saleable, or discrete items*', but employment contracts are identifiable by condition (b) regardless of their types. Moreover, IAS 38 paragraph 15 explicitly claims that an entity usually has insufficient control over the expected future cash flow from a team of skilled staff, specific management, and technical talent, unless it is protected by legal rights.

However, HC's value is normally tied to the tangible and financial assets of the firm, because it is necessary to utilize HC with other assets to create value that generates future cash inflow. Most employees need some physical assets (PCs, office building, machines,

etc.) or financial resources to implement their ideas. In addition, most employees have freedom to choose a company to work for, so companies cannot usually sell employee contracts to other companies. Although employment contracts are identifiable, their characteristics also lead to measurability issues.

The exposure draft (ED) of the conceptual framework (2015)<sup>15</sup> defines an asset as follows: *‘An asset is a present economic resource controlled by the entity as a result of past events. An economic resource is a right that has the potential to produce economic benefits’*. This definition depends on how we interpret ‘rights’, ‘potential to produce economic profits’, and ‘control’. The ED provides detailed explanations of the exact meanings of these words.

Paragraph 4.8 of the ED presents some examples of rights. In particular, 4.8 (c) mentions that the potential for receiving future economic benefits not available to all other parties can be regarded as a right. Moreover, paragraph 4.13 says that the necessary criteria for a resource to have potential to produce economic profits is that the economic resource should already exist, and there should be at least one circumstance in which it would produce economic benefits. The interpretation of potential to produce economic

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<sup>15</sup> This document did not exist when the definition of HC was introduced, so it might have an impact on the definition of HC in the future. However, I focus on the definition and the conceptual framework available at present to investigate current practices.

profits allows managers to recognize a contract (or know-how not in the public domain) with employees as an economic resource, because there is at least one circumstance in which any employee generates economic benefit; otherwise, rational managers would not hire or invest in development activities.

Paragraph 4.20 explains that control can arise if an entity has the present ability to prevent all other parties from directing the use of and obtaining the benefits from the economic resource. In fact, this interpretation is already included in paragraph 4.8 (c). By having the present ability to keep that know-how secret, know-how (sometimes classified as a part of HC) can also be an economic resource controlled by an entity; in other words, an asset.

#### ***4-2. The recognition criteria***

The recognition of an item as an intangible asset in IAS 38 requires the item to meet both the definition of an intangible asset and the recognition criteria. According to IAS 38 paragraph 21, *'(A)n intangible asset shall be recognized if and only if: (a) it is probable that the expected future economic benefits that are attributable to the asset will flow to the entity ; and (b) the cost of asset can be measured reliably'*<sup>16</sup>.

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<sup>16</sup> The ED of the conceptual framework issued in May 2015 no longer identifies reliability as a qualitative characteristic and clarifies that reliability can be interpreted as measurement uncertainty. According to this change, I interpret reliability in IAS 38 as measurement uncertainty.

IAS 38 paragraph 25 explains that firms expect there to be an inflow of economic benefits from an intangible, even if there might be uncertainty about the timing and quantity of its cash flow. Therefore, it concludes that the probability recognition criterion is always satisfied for a separately acquired intangible asset.

On the other hand, it is sometimes difficult to assess whether internally generated intangible assets qualify because of the problems regarding the identifiability of these assets and the reliability of measuring their cost. To assess whether an asset meets these criteria, IAS 38 paragraph 52 requires an entity to classify the generation of an asset into a research phase and a development phase. No intangible costs incurred in the former phase shall be recognized, but an intangible cost incurred in the latter phase shall be recognized if and only if an entity can demonstrate all of the following: (a) technical feasibility, (b) intention to complete the intangible asset, (c) ability to use or sell the intangible asset, (d) existence of a market for or usefulness of the intangible asset, (e) availability of resources to complete the intangible asset, and (f) ability to reliably measure the expenditure attributable to the intangible asset. Furthermore, IAS 38 paragraph 66 (b) explicitly illustrates that the cost of employee benefits arising from the generation of an intangible asset comprises the cost of an internally generated intangible asset.



However, IAS 38 paragraph 68 also specifies that an expenditure that does not satisfy the recognition criteria or is not incurred in a business combination shall be recognized as an expense. IAS 38 paragraph 69 provides examples of these items, and includes expenditures for training activities.

If the current situation is assumed to be the process of a paradigm shift towards the BNM, the measurement attribute that applies to HC evaluation should be fair value (discounted present value of future cash inflow and outflow). I investigate the discounted cash flow method from the measurement uncertainty perspective.

#### ***4-3. Measurement uncertainty of discounted cash flow method***

The discounted cash flow method measures the value of an employee's contract using the net present value of future cash inflows generated by the employee, future cash outflows invested in the employee, or the difference between the former and the latter (Flamholtz, 1971; Lev and Schwartz, 1971; Morse, 1973). This might encourage managers to realize the value of employees when making decisions. For investors, this method might provide information about expectations for employees' future performance, which can be included in their corporate valuation. For instance, Infosys, an Indian IT company, voluntarily disclosed in their annual report the total value of employees measured using Lev & Schwartz's (1971) method.

However, this approach has several limitations and is thus not adopted in current accounting standards. Since the employee's contribution, and thus the future cash-inflow, is uncertain (due to synergy effects), its measurement under uncertainty can be lower than historical cost measurement. Moreover, it is difficult to identify which employee knowledge belongs to and measure the amount of that knowledge, because knowledge moves and its value changes depending on the situation (Mouritsen, 2006).

Measurement uncertainty in evaluating HC using the discounted cash flow method is a most serious problem. HC will not be capitalized at fair value until this problem is solved. Even though the current situation can be interpreted as the process of a paradigm shift towards the BNM, the paradigm shift will inevitably become stuck because of this problem.

Tokuga (2012) conducted a systematic review of value-relevance studies for fair value accounting of financial and non-financial assets. According to the survey, many previous studies reported negative impacts for non-financial assets but positive impacts for financial assets. The results are consistent with some theoretical studies (Edwards and Bell, 1961; Nissim and Penman, 2008; Saito, 2009).

## **5. Missing information about HC**

In this section, I investigate HC from a different perspective by focusing on expenses.

I investigate the portion of information that can be disclosed using IAS 19<sup>17</sup> and the portion that remains non-identifiable.

IAS 19 (2011) describes how managers should report obligations towards their employees on their financial statements, except for transactions to which IFRS 2 share-based payment applies. The standard requires managers to recognize: 1) a liability when an employee has provided service in exchange for employee benefits to be paid in the future and 2) an expense when the entity consumes the service provided by an employee in exchange for employee benefits.

The focus of IAS 19 is the cash outflow paid to employees. In contrast to an approach where the manager evaluates the employment contract by discounting future cash flows, IAS 19 might offer a one-sided view. However, the cash inflow from employees' services is often a part of sales or income from other activities and thus indistinguishable from the latter. Under the circumstance, IAS 19's approach of expensing short-term employee benefits and recognizing future payments as a liability (e.g. defined benefit plan) can be regarded as a feasible treatment.

We currently have no better method than the current asymmetric one that recognizes

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<sup>17</sup> There are currently no accounting standards for the comprehensive treatment of employee benefits in JGAAP and USGAAP; I focus on IAS 19 (2011) here.

long-term expenditure immediately but fails to recognize unrealized future cash inflows from HC as either income or an asset. Non-financial information related to future cash inflows possibly compensates for the asymmetry.

## **6. Summary**

In the current mixed accounting process of a paradigm shift towards the BNM, the recognition of HC on the balance sheet has many problems, primarily in terms of measurement uncertainty. The evaluation of these issues depends on the judgement of information preparers, users, and auditors. Under current practice, in most cases, the level of measurement uncertainty of HC renders its recognition as a separate asset on the balance sheet impossible. As long as the uncertainty is not reduced, this difficulty will remain.

If the current mixed accounting is regarded as a modification/reinforcement of the NIM, it also has a limitation in terms of matching income and expense for most HC; unrealized future cash inflows generated by HC are not recognized in the financial statements and are difficult to predict, as seen in the discussion of the BNM. Therefore, both mixed accounting models inevitably have difficulties in providing future cash inflow information related to HC.

One way to disclose the missing information is to publish an annual report or standalone report including HC as voluntary non-financial information. Skinner (2008)

discussed similar issues regarding intangibles in general, and supported this approach. He believes that there is not sufficient empirical evidence to show that capitalizing intangibles would lead to better decision making by investors. However, he also accepted the limitations of the current accounting system; namely, that it does not provide sufficient information about intangibles. Therefore, he suggested disclosing intangibles using voluntary non-financial measures, but not making such disclosures mandatory because of the challenges of standardization across different industries or business models. In fact, this approach was already adopted in some countries in the early 2000s (IIRC, 2013; Meritum, 2002); however, its impact on investors and managers' disclosure behaviour remains controversial.

Chapter 4 studies the impact on the financial market of initiating disclosure of HC information with other intellectual capital (IC) information in standalone reports. Chapter 5 investigates the association between the amount of voluntary HC disclosures and the company's profile, including required HC and accounting information, to verify and investigate managers' disclosure behaviour. It also verifies the value-relevance of voluntary HC information found in Gamerschlag (2013).

## **Chapter 4: Impact of Non-Financial Intellectual Capital Disclosure on Investors' Decisions**

### **1. Introduction**

This study examines the impact of nonfinancial intellectual capital (IC)<sup>18</sup> information on investor decisions in the Japanese stock market. IC information is becoming an increasingly important business resource. IC information other than that provided in financial statements should play an important role as complementary information. In fact, a global framework for measuring and reporting IC information has been discussed by the International Integrated Reporting Council (IIRC; 2013). Despite growing interest in this topic, however, there is a dearth of research on the impact of disclosing nonfinancial IC information. Consequently, the topics of what non-financial IC information should be disclosed and how to disclose it are actively discussed among accounting researchers.

The impact on investors of non-financial IC, corporate social responsibility (CSR), and environmental reports has been investigated worldwide. According to the results of previous studies, there are associations between the amount of voluntary disclosure and investors' decisions (Aerts et al., 2008; Dhaliwal et al., 2011; Mangena et al., 2016).

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<sup>18</sup> In this chapter, the terms 'intellectual capital' or IC, 'intangibles', and 'knowledge' are used interchangeably.

However, the precise combination of information that contributes to investor decision-making remains an empirical question. IC, by definition, is intimately related to the expectation of future cash flows; therefore, focusing on the contents of IC disclosure is relevant to investor decision-making. By classifying IC information in accordance with accepted academic theory, this study contributes to discussions vis-à-vis an integrated reporting framework.

Japan is one of the few countries that have introduced guidelines for disclosing IC information. From the vast amount of IC information available<sup>19</sup>, given the scope of this study, information was selected from annual reports and standalone IC reports that adheres to these IC reporting guidelines.

I investigate whether the initiation of voluntary disclosure of IC information from 2004–2006 had a significant impact on the capital markets and equity analysts in Japan, and whether the outcomes were favourable to investors and managers. Furthermore, I provide some evidence regarding the categories of IC information that contribute to reducing information asymmetry between managers and investors and affect investor decision making.

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<sup>19</sup> The available information referred to here includes not only annual reports, but also analyst reports, newspapers, magazines, TV news, and the transcripts of conference calls.

Based on the assumption that the IC information disclosed from 2004 to 2006 was not known to investors prior to its disclosure, I expect that the initiation of voluntary IC reporting will reduce information asymmetry between investors and managers. I also examine whether the content of the information matters. MERITUM (2002) classifies IC into three categories: human capital (HC), structural capital (SC), and relational capital (RC). In this context, I examine whether a company should disclose all three categories of IC information. The literature indicates that such disclosures lead to reduced information asymmetry and, consequently, a lower cost of equity capital.

I empirically test the hypotheses using an ordinary least squares regression with financial data from Thomson Reuters Data Stream and consensus analyst estimates from the International Financial Information Service (IFIS). Data regarding the content of disclosures were obtained from firms' annual reports and IC reports.

My study findings provide sufficient but weak evidence that the disclosure of all three categories of IC information leads to a lower cost of equity capital. This finding implies that to reduce information asymmetry, all categories of IC information should be disclosed simultaneously.

The remainder of this chapter is structured as follows. In section 2, I briefly discuss the concept of IC and its definition. In section 3, I discuss the introduction of the IC



reporting practice in Japan, based on prior research. In section 4, I discuss the literature on Japanese IC reporting, and in section 5, I describe in detail the research design. In section 6, the features of the sample data and the results of the regression analysis are presented. In section 7, I interpret the results and discuss their implications and limitations.

## **2. Intellectual capital**

In the mid-1990s, IC was identified as an increasingly important type of capital, both inside and outside businesses (Roslender, 2009). Lev (2001) defined IC as follows.

*Assets are claims to future benefits, such as the rents generated by commercial property, interest payments derived from a bond, and cash flows from a production facility. An intangible asset is a claim to future benefit that does not have a physical or financial (a stock or a bond) embodiment.... Throughout this volume I use the terms intangibles, knowledge assets, and intellectual capital interchangeably. (p.5)*

Unfortunately, there are some confusing similarities among certain terms. Intangible assets such as patents, trademarks, copyrights, and brands were already subject to certain accounting treatments in the pre-IC days (e.g. IAS 19 and IAS 38). Another term, intellectual property (IP), refers to a legally secure nonphysical claim (Lev, 2001). This study considers both intangible assets and IP as subsets of IC.

The following taxonomy is used for the constituents of IC: HC, SC, and RC (Lynn,

1998; Mouritsen, 1998). This taxonomy has proved to be useful and prevailed over the last decade. HC is defined as the knowledge that employees take with them when they leave a firm (MERITUM, 2002). SC is defined as the knowledge that stays within the firm at the end of the working day (MERITUM, 2002). RC refers to all the resources linked to the firm's external relationships, including customers, suppliers, and research and development (R&D) partners (MERITUM, 2002).

The recently applied integrated reporting approach has introduced a different type of classification. For example, the IIRC (2013) classified capital as financial capital, manufactured capital, IC, HC, social and relational capital, and natural capital; it also defined IC as comprising 'organizational, knowledge-based intangibles'—something akin to SC, as defined by MERITUM (2002). Thus, the definition of IC used in this chapter incorporates IC, HC, social and relational capital, and natural capital, as per the IIRC (2013).

Although IC information can be found in financial reports, annual reports, and other media, this study focuses on non-financial IC information in either annual reports or standalone reports. Standalone reports include intellectual asset management reports and intellectual property reports. Since some of the terms used in practice are different from those used in academia, the terms in the reports are interpreted using the above definitions.

### **3. Intellectual capital reporting practice in Japan**

Since the mid-1990s, intangibles have increasingly become the major foundation for value creation and delivery for many enterprises (Roslender, 2009). From the 1990s to the mid-2000s, many researchers internationally have studied IC measurement and reporting issues. While some researchers have discussed whether expenditures related to intangibles should be capitalized (Lev and Zarowin, 1999), others have argued that IC information should be disclosed as non-financial information (Edvinsson, 1997; MERITUM, 2002).

In 2002, the Japanese government published the Intellectual Property Policy Outline as the first step of a reform that aimed to revitalize the Japanese economy and make Japan a country based on intellectual assets. In the following year, to promote this policy, the government encouraged Japanese firms, universities, and other organizations to commence ‘intellectual asset-based management’ (IABM). In 2004, to facilitate communication between markets and enterprises, the Japanese Ministry of Economy, Trade and Industry (METI) published its Reference Guideline for Intellectual Property Information Disclosure. Subsequently, in 2005, METI introduced the revised Guidelines for Disclosure of Intellectual Assets-Based Management.

According to these guidelines, the objectives of IC reporting are to promote among top management the provision to stakeholders, in a simplified manner, of information on

business activities that produce sustainable profits and enhance corporate value and to share a sense of value with them. The principle rules of IC reporting are summarized as follows:

- (1) Provide a corporate overview
- (2) Focus on future value creation
- (3) Highlight the prerequisites for future value creation
- (4) Simplify reporting for important stakeholders
- (5) Provide supplementary and complementary financial information
- (6) Provide supporting key performance indicators
- (7) Facilitate historical comparability
- (8) Explain current business activities on a consolidated basis

Yamauchi (2009) indicated that between 2004 and 2007, 53 listed firms in Japan disclosed their IC information either in an annual report or an IC report. Figure 4-1 shows the number of firms that initiated disclosure of IC information over the 2004–2006 period, while following the guidelines published in 2004–2005. These data are available from Yamauchi (2009) and the Foundation of Intellectual Asset-Based Management website (<http://www.jiam.or.jp/CCP013.html>). Since the interest in this study is the market impact of IC disclosures, the focus is on listed firms. Figure 4-2 shows the breakdown, by

industry, of the listed companies that disclosed IC information during the 2004–2006 period. Firms belonging to the electronics and chemical industries in Japan actively made disclosures during this period. Approximately 10% of all listed firms in Japan belong to these industries; thus, among the firms that actively made such disclosures, the proportions belonging to the electronics and chemical firms—32.7% and 19.2%, respectively—are significantly higher.

■insert Figure 4-1 here■

■insert Figure 4-2 here■

However, Koga et al. (2011) explain that there are two models for IC disclosure: the standalone reporting model and the CSR integrated reporting model. They suggest that since small and medium size enterprises (SMEs) do not have communication tools such as annual reports, CSR reports, or sustainability reports, they would likely choose the standalone reporting model. On the other hand, large companies that publish CSR reports tend to incorporate IC information into them (Koga et al., 2011). Thus, it can be expected that after 2005–2006, listed firms would choose to disclose IC information in their CSR or sustainability reports, rather than in standalone IC reports. Figure 4-3 illustrates the number of unlisted companies that disclosed IC information in IC reports. These data are obtained from the Foundation of Intellectual Asset-Based Management website. As

expected from Koga et al. (2011), the number increased until 2011, but decreased after 2012. The reasons for this decrease are not yet clear; however, this issue is beyond the scope of this study, and could be examined in future research.

■insert Figure 4-3 here■

#### **4. Literature review and research question**

##### ***4-1. Research on Japanese IC practice***

###### ***4-1.1 Guidelines content***

Johanson et al. (2006) compared the Japanese Guideline for Intellectual Property Information Disclosure (GIPID) published in 2004 with two other guidelines—namely, MERITUM and the Danish Guideline for Intellectual Capital Statements. They found four major challenges with respect to IC reporting guidelines; these include challenges that pertain to market communication, management control, uniqueness versus comparability, and confidentiality versus accountability. Girella and Zambon (2013) performed a case study on Japanese IC reporting from the viewpoint of political economics. In that study, the relationship between IC recommendations for corporate reporting and contextual linkages is analysed using a type of discursive analysis. They found that IC is considered not only a management or financing technique deployed by firms, but also an economic and socially constructed concept that can be used to re-stimulate a country's growth. Thus, the guidelines are intended to enlighten firms on IC

reporting and management.

#### ***4-1.2 Communication with investors***

Kagaya (2006) studied the impact of IP reporting on the Japanese financial market, using an event study approach to test whether excessive stock returns changed after the sample firms disclosed IP information. Kagaya's results provide significant evidence that firms that disclosed IP information at some time after the shareholders meeting have higher stock returns, and those that disclosed IP information in fewer pages have higher stock returns. In addition, Sakakibara et al. (2010) studied the current non-financial IC disclosure practice in Japan and the extent to which it contributed to analysts' valuations. That study was conducted using questionnaires, and revealed that there is an information gap between the accessibility and importance of some IC information. In terms of HC, there seems to be an extremely wide information gap with respect to management quality, employee training, satisfaction, and participation. The study concluded that it is very difficult for both analysts and ordinary investors to evaluate companies, given that non-financial IC disclosures are insufficient.

#### ***4-1.3 Communication with other stakeholders***

Johanson et al. (2009) investigated how small and medium-sized high-tech Japanese firms applied the IABM guidelines issued by METI in 2005. They discuss the IABM

reports of four newly established Japanese companies, as well as the outcomes of some interviews. The study found that the IABM reports were primarily used for financial purposes and as a vehicle for external communication with existing and potential customers. In addition, Koga et al. (2011) used questionnaire-based research to investigate the impact of IABM reports in Japan. The sample comprised mostly SMEs, and the study revealed that the disclosure had the greatest impact on employees, followed by those in financial institutions, and clients/corporate groups. The study concluded that SMEs publish these reports to inform stakeholders of their competitive advantages.

Holland et al. (2012) investigated how Japanese financial firms (JFFs) acquire and use corporate IC information in their investment decisions, how this activity contributes to knowledge creation among JFFs, and how JFFs affect knowledge creation in the investee company. In this context, four JFFs were examined within the framework of the ‘theory of knowledge-creating firms’, suggested by Nonaka and Toyama (2005). The study found that IC information has an impact on earnings estimates and company valuation, and that knowledge creation by JFFs provides opportunities to increase disclosures and improve accountability between JFFs and their investee companies.

#### ***4-2. Research on the investor impact of IC disclosure***

Information asymmetry between managers and investors reduces market liquidity for



the firms' shares; therefore, because investors pay less for shares that bear high transaction costs, asymmetry forces firms to raise capital at a discount (Welker, 1995). Firms can lower that discount by improving disclosure and reducing the cost borne by investors in acquiring private information (Diamond and Verrecchia, 1991). In theory, greater disclosure reduces the estimation risk associated with expected stock returns. As Lambert et al. (2007) pointed out, lowering the estimation risk results in a lower required rate of return; therefore, in theoretical studies, the expected impact of IC disclosure on the cost of equity capital is negative.

Several empirical studies investigate the relationship between IC disclosure and the cost of equity capital. The results report both positive and negative associations between IC disclosure and the cost of equity capital (Kristandl and Bontis, 2007; Mangena et al., 2016; Orens et al., 2009; Singh and Van der Zahn, 2007). Singh and Van der Zahn (2007) found evidence of a positive relationship between IC disclosure and the cost of capital among initial public offering firms. On the other hand, Kristandl and Bontis (2007), Orens et al. (2009), and Mangena et al. (2016) each provided evidence of a negative association between IC disclosure (i.e. forward-looking disclosures, web-based IC disclosures, and interactions between financial and IC disclosures, respectively) and the cost of equity capital. However, none of these studies investigates what items contribute to higher or

lower equity capital costs.

#### ***4-3. Research question***

The results reported in the literature on the relationship between IC disclosure and the cost of equity capital appears to be controversial. International evidence on the relationship between IC disclosure and the cost of equity capital is divergent. In studying the Japanese market, Kagaya (2006) found a relationship between excess returns and IP information, but Sakakibara et al. (2010) concluded that because non-financial IC disclosures are insufficient, it is very difficult for both analysts and ordinary investors to evaluate companies. Differences in the findings may be due to the scope of the studies. Kagaya (2006) focused on firms that began to publish IP reports; the sample in that study thus consisted of firms with a positive attitude towards voluntary disclosures. On the other hand, Sakakibara et al. (2010) examined analysts' responses to a questionnaire. It is expected that analysts would answer the questionnaire by considering not only the firms that publish IP reports, but also other firms under coverage. Moreover, the scope of the information examined differed among these studies. Kagaya (2006) examined IP information, while Sakakibara et al. (2010) studied IC information. As Sakakibara et al. (2010) pointed out, discrepancies may be due to the use of IC information, rather than IP information. Whether the discrepancy would resolve once firms disclose such

information remains unclear. Therefore, it is important to investigate firms that disclose IC information and identify what information contributes to communication between managers and investors.

Specifically, the research question in this study pertains to whether IC reporting reduces information asymmetry, and what content should be disclosed to achieve this.

## **5. Hypotheses and research design**

This study examines the impact on the Japanese capital market of the initiation of IC disclosures that were informed by METI guidelines. By focusing on the initiation of IC disclosure, incremental IC disclosure can be identified in a reasonable manner. This study also validates the narrative approach employed by the guidelines.

The relationship between disclosures and market response is often measured in terms of the cost of equity capital (Botosan, 1997; Botosan and Plumlee, 2002; Diamond and Verrecchia, 1991; Dhaliwal et al., 2011). For instance, Dhaliwal et al. (2011) pointed out that a reduction in firms' cost of equity capital explains the trend of increased CSR disclosure. Although the causality between disclosure and reduction in the cost of equity capital is still under discussion, reduced information asymmetry between managers and investors should have some impact. It is possible to examine the market impact using various indices. This study begins with the cost of equity capital, as it is considered one of the reasons managers voluntarily disclose additional information.

Do additional IC disclosures impact investors? In Japan, the manner in which IC information is disclosed varies across companies. First, this study tests whether the initiation of any IC disclosure has statistically significant effects on investors. As mentioned, the cost of equity capital was analysed to determine the impact of disclosure. In the current study, an empirical method was employed to test the following hypotheses.

**Hypothesis 1:** Companies that disclose any additional IC information have a lower cost of capital than they would otherwise, due to reduced information asymmetry.

The following regression model was constructed to test the above hypothesis:

$$\begin{aligned}
 & \text{[Cost of Equity Capital]} \\
 & = \alpha + \beta_1 \text{Post} + (\text{Market Book Ratio}) + (\text{Analyst Error}) \\
 & + (\text{SDROE}) + (\text{Debt Ratio}) + (\text{Year Dummy}) \\
 & + (\text{Industry Dummy}) + (\text{Scale Dummy}) + \varepsilon \qquad (1)
 \end{aligned}$$

In equation (1), the explained variable was the cost of equity capital, obtained using Easton's (2004) modified price earnings growth model. The following equation was used

to calculate the implied cost of equity capital<sup>20</sup>:

|Cost of Equity Capital|

$$= \sqrt{\frac{(\text{Expected Accounting Earnings at Year 2}) - (\text{Expected Accounting Earnings at Year 1})}{(\text{Share Price at present})}}$$

Consensus analyst estimates from IFIS were used as expected accounting earnings, and stock price data was obtained from Thomson Reuters Data Stream to derive the present share price. The explanatory variable *Post* was a dummy variable with the value 1 if the firm has disclosed any additional IC information, and 0 otherwise. Certain criteria and assumptions were used to determine whether a firm started to disclose IC information. I assumed that firms did not otherwise disclose the IC information provided in either the annual reports or the IC reports until those reports were published. I also assumed that the study by Yamauchi (2009) provided a sample of all relevant listed firms between 2004 and 2006. A firm that disclosed IC information was defined as one that explained at least one of its IC forms from Table 4-1 in a narrative format, and that this information was supported by certain indices. Thus, IC information that failed to meet these criteria was

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<sup>20</sup> There are several other methods that could be used to calculate the implied cost of equity capital (e.g. Clause and Thomas, 2001; Gabhardt et al., 2001; Ohlson and Juettner-Nauroth, 2005). However, to preclude multiple solutions, Easton (2004) is used, with the assumptions that there is no expected dividend next year nor any unique perpetual rate of change in the abnormal growth in earnings. In addition, Botosan and Plumlee (2002) also indicate that the costs of capital obtained from the other approaches are similar and positively correlated.

not considered disclosed IC information, *per se*. The classification of IC information based on the METI guidelines is shown in Table 4-1.

■insert Table 4-1 here■

The remainder of the explanatory variables were control variables. Fama and French (1992) found that the market-to-book ratio (*Market Book Ratio; MB*) has a significant impact on the cost of equity capital. *Analyst Error (AE)* was a surrogate variable for the quality of private information disclosures; it was calculated by dividing the absolute value of the difference between realized income and expected income by book value. The standard deviation (SD) of return on equity (*SDROE*) was a control variable for the estimation risk in accounting numbers (Muramiya, 2005). *Debt Ratio (DR)* was a control variable for the effect of leverage (Mangena et al., 2016; Orens et al., 2009). Data from the five previous years was used and the *Year Dummy* represented the unique effect for each year. The industry and scale dummies were based on the classifications of the Tokyo Stock Exchange.

The primary sample included all listed firms that disclosed additional IC information between 2004 and 2006 that adhere to the guidelines and satisfy the criteria. The control sample comprised previous-year data that were paired with the main sample. For the control sample, this study considered selecting firms that did not make any disclosure and

pairing them with those from the main sample, based on industry and scale; however, since most of the top 20 electronics firms had disclosed IC information, it was difficult to select their counterparts. Since almost half of the companies that disclosed IC information belonged to the electronics industry, data from before the disclosure was used as the control sample.

Table 4-2 presents the mean value of the explanatory variables, the results of *t*-tests of differences in the means of the main and control samples, and the Mahalanobis distance between the main and control samples. No *p*-value is lower than 0.10; therefore, in terms of numerical factors that influence the cost of equity capital, differences between the main sample and the control sample are not statistically significant. Since the control sample comprises previous-year data paired with the main sample, the numbers of firms in each industry and scale are the same as those in the main sample. Although the time-series trend is not adjusted using the matching method, it can be partially controlled by *Post* or *Year Dummy* variables. In summary, the control sample can be assumed to be an appropriate matching sample.

■insert Table 4-2 here■

The variable of interest in the regression models was *Post*. The coefficient of this variable was expected to be negative and significant. Firms disclose IC information partly

because they want to reduce the cost of equity capital. The results of the regression analyses will provide some significant evidence on whether investors value any IC information disclosure.

This study also examines the impact of the content of disclosures on the capital market. The content of IC disclosures is categorized as HC, SC, and RC (Lynn, 1998; Mouritsen, 1998). While many researchers have attempted to explain the process of value creation in firms (Holland, 2001; Nonaka and Takeuchi, 1995), there has been no consensus. Although this process is a ‘black box’, it can be assumed that disclosure of all three categories of IC would lead to value creation. If investors consider IC disclosures relevant information only if all three categories of IC information are provided, then a reduction in the cost of equity capital will be observed only among those firms that disclose all three categories of information. Therefore, I proposed the following hypothesis.

**Hypothesis 2:** Companies that disclose all three categories of additional IC information have a lower cost of equity capital than they would otherwise, due to reduced information asymmetry.



To test the above hypothesis, the following regression model was constructed:

$$\begin{aligned}
 |\text{Cost of Equity Capital}| = & \alpha + \beta_1 SC + \beta_2 RC + \beta_3 HCSC + \beta_4 SCRC + \beta_5 HCSCRC + \\
 & (\text{Market Book Ratio}) + (\text{Analyst Error}) + (\text{SDROE}) + (\text{Debt Ratio}) + \\
 & (\text{Year Dummy}) + (\text{Industry Dummy}) + (\text{Scale Dummy}) + \varepsilon \quad (2)
 \end{aligned}$$

The explained variables in equation (2) were the same as those in equation (1). Again, consensus analyst estimates from IFIS were used and stock price data is obtained from Thomson Reuters Data Stream. Regarding the explanatory variables<sup>21</sup>, *SC* (*RC*) was a dummy variable with the value of 1 if the firm discloses only *SC* information that was supported by quantitative indices, and 0 otherwise. *HCSC*, *SCRC*, and *HCSCRC* were dummy variables. For instance, the value of *HCSCRC* was 1 if the firm disclosed *HC*, *SC*, and *RC* information that was supported by quantitative indices, and 0 otherwise. *HCSC* and *SCRC* were defined similarly. The control variables and assumptions were the same as those in equation (1).

The variable of interest in the regression model was *HCSCRC*. The coefficient of this variable was expected to be negative and significant. Since *IC* comprises *HC*, *SC*, and *RC*, any of them can be easily mobilized as befits the situation (Mouritsen, 2006). This

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<sup>21</sup> There is no firm in the sample that disclosed solely *HC* (or *HC* and *RC*) information. Therefore, there is no explanatory variable for *HC* or *HCRC*.

study expects that firms can reduce the cost of equity capital only if they make disclosures for all three categories of IC. Since value creation is a spiral process that begins with the individual employee and involves internal and external resources, investors require narratives from all three categories (Nonaka and Takeuchi, 1995). If investors consider only IC information that satisfies certain conditions, the coefficients of the corresponding variables will be significant.

## **6. Results**

### ***6-1. Sample***

In Japan, 52 listed firms took the initiative to disclose IC information between 2004 and 2006. However, only 39 firms have data available. Therefore, the sample size including the control sample is 78. Table 4-3 shows the summary statistics of the numerical variables in the regression models. Table 4-4 presents the Pearson product moment correlation coefficients. There is a weak correlation between *DR* and the other numerical control variables; however, the correlation is less than 0.4, and it is assumed in the regression models that they are independent of each other.

■insert Table 4-3 here■

■insert Table 4-4 here■

Table 4-5 shows the number of firms, by industry, in terms of the content disclosed. Most firms in the sample disclosed a combination of SCRC information. With regard to

SC and RC, firms in the manufacturing industry had a more positive outlook than those in the other industries; however, trends regarding HC are still ambiguous. Similarly, Tables 4-6 and 4-7 show the number of firms and their type of content disclosure, by *Year* and *Scale* matrices, respectively. No companies in the sample initiated disclosure of HC information prior to 2005. It was observed that the larger the company, the greater the probability that it would disclose IC information.

■insert Table 4-5 here■

■insert Table 4-6 here■

■insert Table 4-7 here■

A hierarchical log linear model and R software are used to determine whether these dummy variables are independent of each other. This method generates graphical models with multivariate discrete data. The graph comprises vertices and edges; the vertices represent each discrete random variable, and the edges depict the partial correlation between two random variables given that the rest of the variables are fixed. Therefore, if there is no edge between any two variables, then the two variables are conditionally independent, provided that the remainder of the variables are constant<sup>22</sup>.

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<sup>22</sup> For a detailed theoretical explanation of R instruction, we refer to Edwards (1995) and Højsgaard et al. (2012).

The dummy variables are *Content*, *Year*, *Industry*, and *Scale*. *Content* is a categorical variable with the following levels: No, SC, RC, HCSC, SCRC, and HCSCRC. *Year*, *Industry*, and *Scale* are the same as those defined in the Section 5. The saturated model is used as the starting point, and model selection is implemented using a stepwise function. For the penalty parameter, both the Akaike information criterion (AIC) and the Bayesian information criterion (BIC) are used. The BIC penalizes complex models more heavily than does the AIC, and thus tends to select a simpler model (Højsgaard et al., 2012).

Figures 4-4 and 4-5 show the results of the graphical models with AIC and BIC, respectively. The AIC graph indicates that there are two edges; the notable one is that between *Year* and *Content*. It is reasonable for there to be some relationship between *Year* and *Content*, given the differences between the guidelines released in 2004 and 2005. However, the BIC graph shows that there is no edge between any two vertices. This can be interpreted as each variable being conditionally independent. Although there are weak relationships between some variables, independence can be assumed.

■insert Figure 4-4 here■

■insert Figure 4-5 here■

## **6-2. Regression results**

Table 4-8 shows the results of regression model (1). The adjusted  $R^2$  (0.4412)

indicates that the model itself is not weak. However, the  $p$ -value of the coefficient of the variable *Post* is 0.19986. Hence, there is not sufficient evidence to conclude that any IC disclosure will reduce the cost of equity capital. Thus, at this stage, the impact of any IC disclosure is uncertain. In other words, this regression analysis does not provide any evidence in support of Hypothesis 1. However, this does not imply that any IC disclosure has *no* significant impact on investor decision-making.

■insert Table 4-8 here■

Table 4-9 shows the results of regression model (2). The adjusted  $R^2$  (0.4613) indicates that the model is reasonably sound. The coefficient of *HCSCRC* is negative and statistically significant: the  $p$ -value is 0.0995 using a two-tailed test. This result is in line with expectations. Specifically, at the 10% significance level, there is sufficient evidence that firms that disclose all three categories of IC information will reduce their cost of equity capital by about 2.2%. Therefore, this regression analysis provides statistical evidence that supports Hypothesis 2. However, the coefficients of the other content variables are not significant. The implications of the findings are discussed in the next section.

■insert Table 4-9 here■

### **6-3. Robustness test<sup>23</sup>**

In the previous regression models, the sample errors are assumed to be independent and have equal variance. Under the more general assumption that the regression errors are independent but have distinct variances, White's (1980) estimator (sometimes referred to as a heteroskedasticity-consistent estimator) is used. Table 4-10 shows the result of the regression with heteroskedasticity-consistent standard errors. The  $p$ -value for the coefficient of *HCSCRC* is 0.121999, which is no longer significant at the 10% level. Therefore, the results of regression (2) might not be robust, and instead indicate a somewhat weak trend.

■insert Table 4-10 here■

## **7. Implications and limitations**

This study uses an empirical approach to examine the impact of non-financial IC disclosures (HC in particular) on investors' decision making. Actual data is used to test the hypotheses that initiating disclosure of non-financial IC (together with HC) information reduces the information asymmetry between managers and investors.

The findings show statistically significant but weak evidence that allows the

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<sup>23</sup> In some studies, additional tests include replacement of the dependent variable with a risk index, such as  $\beta$  or the standard deviation of stock returns. However, additional tests are not implemented in this study because many elements other than information asymmetry affect the risk index.

conclusion that firms that disclose all the three categories (HC, SC, and RC) of IC information enjoy a lower cost of equity capital, but those firms that disclose other combinations do not. The implications of these findings as follows.

Botosan (1997) explained that ‘greater disclosure enhances stock market liquidity thereby reducing cost of equity capital either through reduced transaction costs or increased demand for a firm’s securities’ (p. 324). The regression analysis in this study provides significant but weak evidence only for those firms that disclosed all three categories of IC information; however, this does not indicate whether the lack of disclosure by other firms had any impact on investor decision-making. The findings suggest that it is advisable for a manager to disclose all three categories of IC information, if the aim is to reduce the cost of equity capital. It is unclear whether the categories of IC should relate to each other, since the criteria for IC data do not specify that they be related. In other words, when the data was collected, the criteria did not specify that all three categories should be related for value to be created.

However, Nonaka and Takeuchi (1995) explained that the knowledge-creation process is a spiral process where knowledge is mobilized from individuals to groups of people and firms. Since knowledge is the most important resource in a knowledge economy, it has value. In terms of the knowledge-creation process, the conclusion is that

all three categories of IC are essential to explain a firm's value creation process. As in Holland's (2001) explanation of the relationship between IC and the value-creation process, HC, SC, and RC interact with each other and constantly generate innovation, albeit in a chaotic manner.

There are two rationales as to why disclosing all three categories of IC would have an impact on corporate value. The Danish Ministry of Science, Technology and Innovation (DMSTI) (2003) suggested disclosing all three categories, because disclosure encourages firms to manage the value-creation process by considering IC. Through IC management, future cash flows can be expected to increase. On the other hand, METI (2004) pointed out that communicating IC initiatives to investors facilitates financial analysis and signals the excellence of those initiatives. If, as a result, corporate value increases, the cost of equity capital should decrease. Thus, the findings in this study are consistent with the theoretical expectation and are significant for Japanese managers in terms of decisions regarding the content and manner of IC information disclosures. Moreover, the results encourage firms to follow the integrated reporting approach suggested by the IIRC (2013).

By focusing on HC disclosure, the evidence indicates that disclosing non-financial HC information is the right direction, but it still does not have the expected impact that



HC deserves. If there is too much information, important information becomes diluted. The most important thing is not arbitrarily disclosing information belonging to all three categories, but disclosing information related to the value-creation process as an organic link among all three categories. HC information should play an important role as a starting point for value creation. A disclosure study of the relationships between HC and the value-creation process at the individual or organizational levels would be important future research.

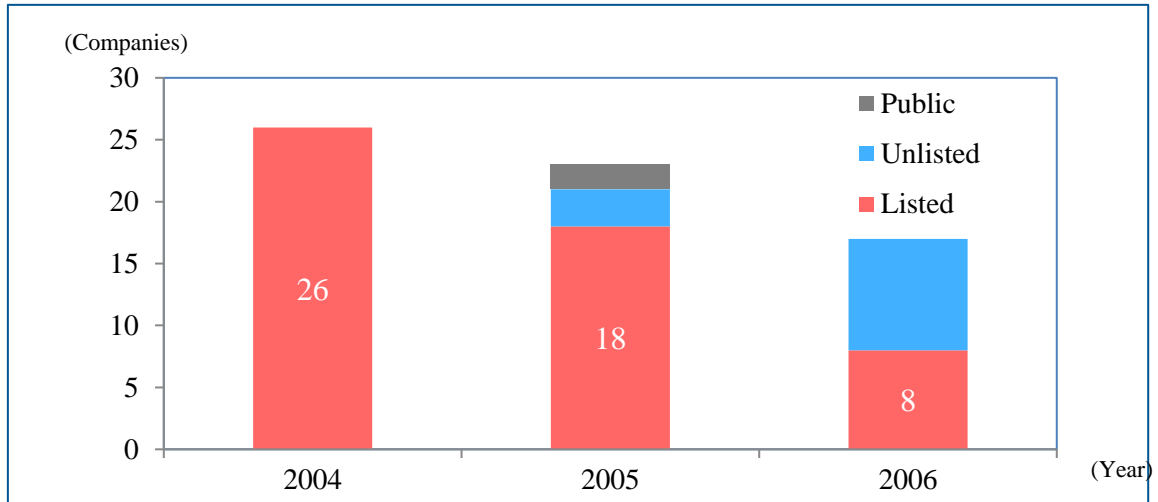
There are some limitations to this study. First, the sample size may be too small to obtain appropriate results from the regression models. All available samples were used to the greatest extent possible; however, further analysis that uses a larger sample should be considered in future research. In particular, should a sufficient sample size be available, a difference-in-differences analysis would be an appropriate means of testing causality between disclosure and the cost of capital.

Second, the criteria regarding whether a firm has started disclosing additional IC information may not be realistic. This study assumes that a firm discloses additional IC information only when it publishes an IC report that adheres to the guidelines. It is possible that a firm has already disclosed this information through other channels, prior to report publication. In any case, the possibility that a firm has voluntarily disclosed

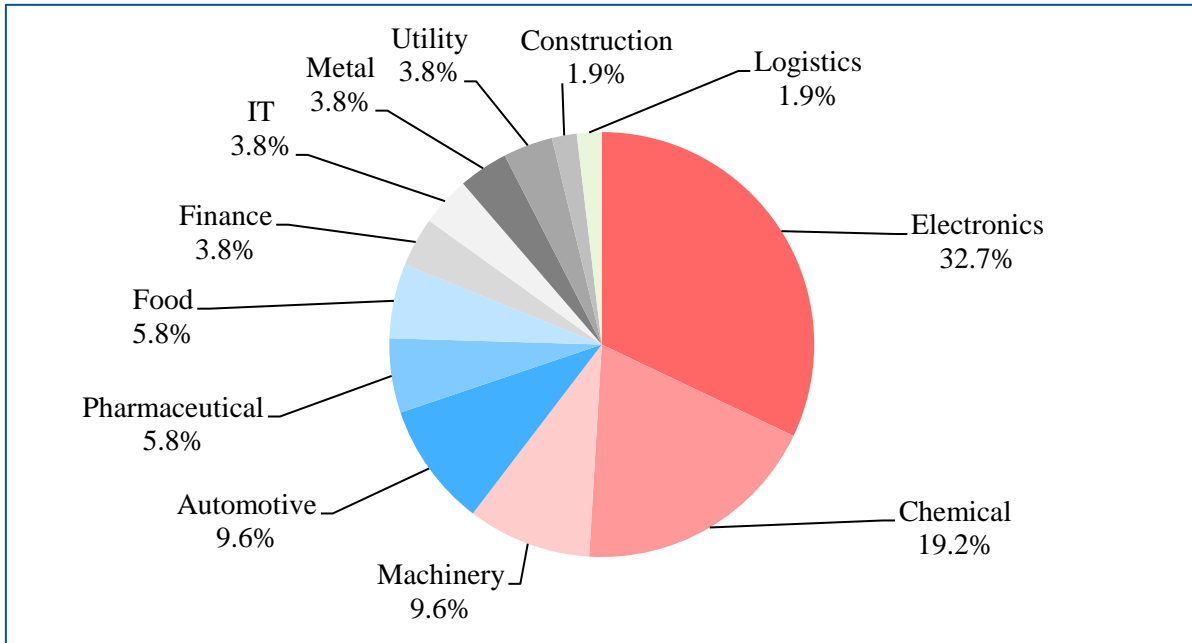
additional IC information prior to the guidelines is low, as doing so would incur higher information costs for the firm. Therefore, this assumption should not lead to bias in the final result.

Finally, this study focuses on the benefit of disclosing additional IC information, but it does not thoroughly investigate the cost of disclosing it. Disclosure will incur two kinds of cost—namely, direct cost and indirect cost. A direct cost is the cost of collecting and disclosing data (e.g. expenses related to introducing new IT software or human resources to work on the disclosure task). An indirect cost is negative consequences of the disclosure (e.g. losing a competitive advantage in product design, human resources, or marketing). This topic, along with the decision to disclose information, poses an important question for future research.

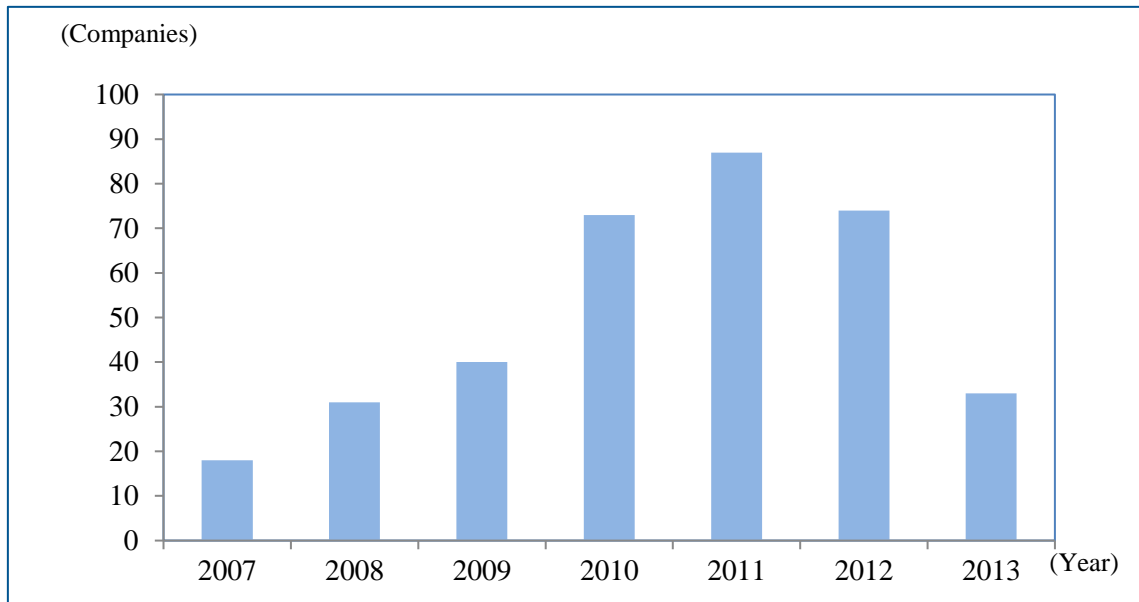
**Figure 4-1: Number of companies in Japan that initiated the disclosure of IC information in the annual/IC report (2004–2006)**



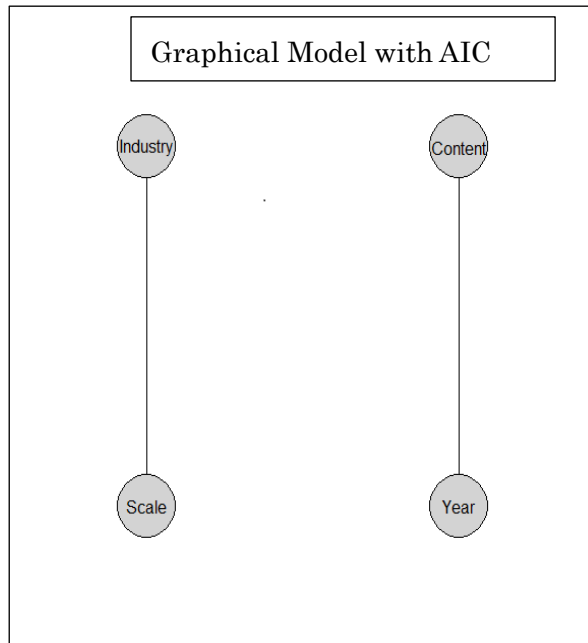
**Figure 4-2: Breakdown of listed companies in Japan, by industry, that disclosed IC information (2004–2006)**



**Figure 4-3: Number of unlisted companies in Japan that disclosed IC information in IC reports (2007–2013)**

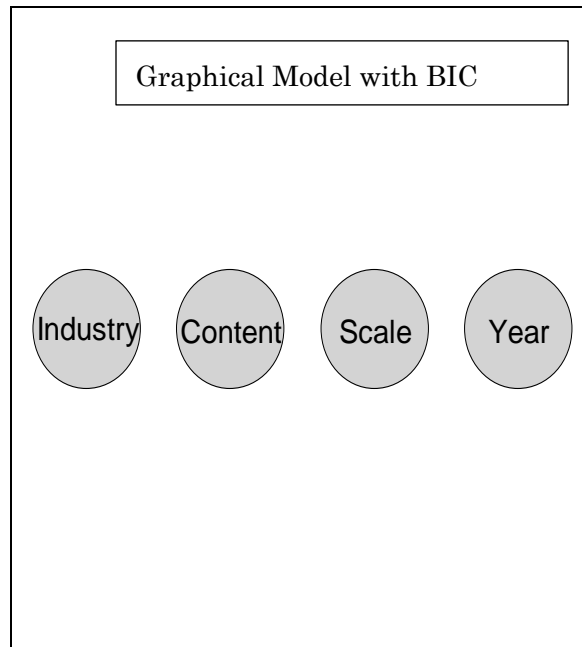


**Figure 4-4: Relationship among dummy variables, with the Akaike information criterion**



**Note.** *Industry* refers to one of 33 industry classifications on the Tokyo Stock Exchange (TSE). *Content* is a categorical variable describing the content of the annual report as SC, RC, HCSC, SCRC, or HCSCRC. *Scale* is a four-degree classification of TSE stocks (i.e. core, large, medium, or small). *Year* is a year dummy variable (2004, 2005, and 2006).

**Figure 4-5: Relationship among dummy variables, with the Bayesian information criterion**



**Note.** *Industry* refers to one of 33 industry classifications on the Tokyo Stock Exchange (TSE). *Content* is a categorical variable describing the content of the annual report as SC, RC, HCSC, SCRC, or HCSCRC. *Scale* is a four-degree classification of TSE stocks (i.e. core, large, medium, or small). *Year* is a year dummy variable (2004, 2005, and 2006).

**Table 4-1: Categorization of IC**

<b>Category</b>	<b>Content</b>	<b>Examples</b>
<b>HC</b>	Education/training	Qualifications, degrees
	Experience	Number of years in related jobs
	Motivation	Employee satisfaction
	R&D (human resources)	Number of R&D employees
	Core technology	Special skills of employees
<b>SC</b>	Management philosophy	Extent of employee involvement
	Business model	Investment allocation
	R&D concentration	R&D rate for core segments
	Employee evaluation	Awards for high performers
	Compliance	Compliance check system
	Litigation risk	Compensation
	New product development	Future R&D expense
	Intellectual property	Patents, trademarks
	Core technology	Technology accumulated
	<b>RC</b>	Customer loyalty
Brands		Reputation
License contract		Technological licensing contracts
Cooperation		Joint projects with the government
Customer satisfaction		Fulfilment of medical needs
Environmental contribution		Environmental accounting
Social responsibility		Community service



**Table 4-2: Mean of each numerical explanatory variable, for the main and control samples**

	<b>Main</b>	<b>Control</b>	<b>Difference</b>	<b><i>t</i>-value</b>	<b><i>p</i>-value</b>
<b><i>MB</i></b>	1.925	1.734	0.191	1.126	0.260
<b><i>AE</i></b>	0.010	0.014	-0.004	-1.220	0.226
<b><i>SDROE</i></b>	0.073	0.082	-0.009	-0.494	0.621
<b><i>DR</i></b>	2.200	2.569	-0.369	0.752	0.453
				<b><math>\chi^2</math>-value</b>	<b><i>p</i>-value</b>
<b>Mahalanobis distance</b>	-	-	-	41.867	0.834

**Note.** *MB* is the market-to-book ratio at the end of the quarter in which firms release the annual report. *AE* is the absolute value of the difference between the analyst consensus and the actual value, divided by book value. *SDROE* is the standard deviation of the return on equity over the past five years. *DR* is the debt ratio at the end of the quarter in which firms release the annual report.

**Table 4-3: Summary statistics**

	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Median</b>	<b>SD</b>
<i>COEC</i>	0.03835	0.1492	0.08690	0.08572	0.02391
<i>MB</i>	0.670	5.330	1.884	1.845	0.82970
<i>AE</i>	0.000009	0.06318	0.01154	0.00624	0.01303
<i>SDROE</i>	0.008991	0.607645	0.078576	0.07857	0.09099
<i>DR</i>	0.2237	6.7666	2.0080	1.3170	1.654247

**Note.** *COEC* is the implied cost of equity capital calculated by using Easton (2004)'s method. *MB* is the market-to-book ratio at the end of the quarter in which firms release the annual report. *AE* is the absolute value of the difference between the analyst consensus and the actual value, divided by book value. *SDROE* is the standard deviation of the return on equity over the past five years. *DR* is the debt ratio at the end of the quarter in which firms release the annual report.

**Table 4-4: Pearson's product-moment correlation coefficient**

	<i>COEC</i>	<i>MB</i>	<i>AE</i>	<i>SDROE</i>	<i>DR</i>
<i>COEC</i>	1.000				
<i>MB</i>	0.034	1.000			
<i>AE</i>	0.460	-0.043	1.000		
<i>SDROE</i>	0.229	-0.101	0.248	1.000	
<i>DR</i>	0.322	-0.327	0.272	0.383	1.000

**Note.** *COEC* is the implied cost of equity capital calculated by using Easton (2004)'s method. *MB* is the market-to-book ratio at the end of the quarter in which firms release the annual report. *AE* is the absolute value of the difference between the analyst consensus and the actual value, divided by book value. *SDROE* is the standard deviation of the return on equity over the past five years. *DR* is the debt ratio at the end of the quarter in which firms release the annual report.

**Table 4-5: IC content disclosed, by industry**

	<b>SC</b>	<b>RC</b>	<b>HCSC</b>	<b>SCRC</b>	<b>HCSCRC</b>	<b>Total</b>
<b>Electronics</b>	3	2	0	9	1	15
<b>Chemical</b>	2	1	1	4	1	9
<b>Machinery</b>	0	1	0	2	0	3
<b>Automotive</b>	1	0	0	2	0	3
<b>Pharmaceutical</b>	0	0	0	2	0	2
<b>Food</b>	1	0	0	2	0	3
<b>IT</b>	0	0	1	0	0	1
<b>Utility</b>	0	0	0	1	0	1
<b>Construction</b>	0	0	0	0	1	1
<b>Logistics</b>	0	0	0	1	0	1
<b>Total</b>	7	4	2	23	3	39

**Table 4-6: Content disclosed, by year**

	<b>SC</b>	<b>RC</b>	<b>HCSC</b>	<b>SCRC</b>	<b>HCSCRC</b>	<b>Total</b>
<b>2004</b>	3	1	0	13	0	17
<b>2005</b>	4	3	2	6	2	17
<b>2006</b>	0	0	0	4	1	5
<b>Total</b>	7	4	2	23	3	39

**Table 4-7: Content disclosed, by scale**

	<b>SC</b>	<b>RC</b>	<b>HCSC</b>	<b>SCRC</b>	<b>HCSCRC</b>	<b>Total</b>
<b>Core 30</b>	1	0	0	7	2	10
<b>Large 70</b>	1	0	0	8	0	9
<b>Mid 400</b>	5	4	2	8	1	20
<b>Total</b>	7	4	2	23	3	39

Note. **Core 30, Large 70, and Mid 400** represent a scale classified in terms of total market value and liquidity by TSE. The largest is **Core 30** followed by **Large 70** and then **Mid 400**.

**Table 4-8: Results of regression model (1)**

<b>Coefficients</b>	<b>Estimate</b>	<b>Std. Error</b>	<b>t-value</b>	<b>p-value</b>
<b>(Intercept)</b>	0.067287	0.012568	5.354	1.54e-06***
<i>Post</i>	0.006881	0.005307	1.297	0.19986
<i>MB</i>	0.004342	0.002877	1.509	0.13672
<i>SDROE</i>	-0.017605	0.030906	-0.570	0.57111
<i>AE</i>	0.414035	0.194182	2.132	0.03724**
<i>DR</i>	0.002538	0.001925	1.318	0.19256
<i>Year Dummy</i>			Yes	
<i>Industry Dummy</i>			Yes	
N			78	
<b>Adjusted R<sup>2</sup></b>			0.4412	

\*Two-tailed significance at the 10% level.

\*\*Two-tailed significance at the 5% level.

\*\*\*Two-tailed significance at the 1% level.

**Note.** *Post* is an indicator variable that takes the value of 1 if the firm discloses IC information in its annual report, and 0 otherwise. *MB* is the market-to-book ratio at the end of the quarter in which firms release the annual report. *AE* is the absolute value of the difference between the analyst consensus and the actual value, divided by book value. *SDROE* is the standard deviation of the return on equity over the past five years. *DR* is the debt ratio at the end of the quarter in which firms release the annual report.

**Table 4-9: Results of regression model (2)**

<b>Coefficients</b>	<b>Estimate</b>	<b>Std. Error</b>	<b>t-value</b>	<b>p-value</b>
<b>(Intercept)</b>	0.0682694	0.0126450	5.399	1.54e-06***
<i>SC</i>	0.0094369	0.0082561	1.143	0.2581
<i>RC</i>	0.0056406	0.0107199	0.526	0.6009
<i>HCSC</i>	-0.0025255	0.0156789	-0.161	0.8726
<i>SCRC</i>	0.0086827	0.0059144	1.468	0.1479
<i>HCSCRC</i>	-0.0220099	0.0131327	-1.676	0.0995*
<i>MB</i>	0.0046706	0.0028753	1.624	0.1101
<i>SDROE</i>	-0.0159902	0.0307071	-0.521	0.6047
<i>AE</i>	0.4540306	0.1966003	2.309	0.0248**
<i>DR</i>	0.0023613	0.0019307	1.223	0.2266
<i>Year Dummy</i>			Yes	
<i>Industry Dummy</i>			Yes	
<b>N</b>			78	
<b>Adjusted R<sup>2</sup></b>			0.4613	

\*Two-tailed significance at the 10% level.

\*\*Two-tailed significance at the 5% level.

\*\*\*Two-tailed significance at the 1% level.

**Note.** *SC* is an indicator variable that takes the value of 1 if the firm discloses only SC information in its annual report, and 0 otherwise. *RC* takes the value of 1 if the firm discloses only RC information in its annual report, and 0 otherwise. *HCSC* takes the value of 1 if the firm discloses both HC and SC information in its annual report, and 0 otherwise. *SCRC* takes the value of 1 if the firm discloses both SC and RC information in its annual report, and 0 otherwise. *HCSCRC* takes the value of 1 if the firm discloses all three categories of IC information in its annual report, and 0 otherwise. *MB* is the market-to-book ratio at the end of the quarter in which firms release the annual report. *AE* is the absolute value of the difference between the analyst consensus and the actual value, divided by book value. *SDROE* is the standard deviation of the return on equity over the past five years. *DR* is the debt ratio at the end of the quarter in which firms release the annual report.



**Table 4-10: Results of regression (2) with heteroskedasticity-consistent estimator**

<b>Coefficients</b>	<b>Estimate</b>	<b>Std. Error</b>	<b>t-value</b>	<b>p-value</b>
<b>(Intercept)</b>	0.0682694	0.0096222	7.095	2.89e-09***
<i>SC</i>	0.0094369	0.0085127	1.109	0.272530
<i>RC</i>	0.0056406	0.0073691	0.765	0.447346
<i>HCSC</i>	-0.0025255	0.0047832	-0.528	0.599668
<i>SCRC</i>	0.0086827	0.0054526	1.592	0.117133
<i>HCSCRC</i>	-0.0220099	0.0140092	-1.571	0.121999
<i>MB</i>	0.0046706	0.0025553	1.828	0.073110*
<i>SDROE</i>	-0.0159902	0.0186544	-0.857	0.395131
<i>AE</i>	0.4540306	0.1423428	3.190	0.002372***
<i>DR</i>	0.0023613	0.0015159	1.558	0.125158
<i>Year Dummy</i>			Yes	
<i>Industry Dummy</i>			Yes	
<b>N</b>			78	

\*Two-tailed significance at the 10% level.

\*\*Two-tailed significance at the 5% level.

\*\*\*Two-tailed significance at the 1% level.

**Note.** *SC* is an indicator variable that takes the value of 1 if the firm discloses only SC information in its annual report, and 0 otherwise. *RC* takes the value of 1 if the firm discloses only RC information in its annual report, and 0 otherwise. *HCSC* takes the value of 1 if the firm discloses both HC and SC information in its annual report, and 0 otherwise. *SCRC* takes the value of 1 if the firm discloses both SC and RC information in its annual report, and 0 otherwise. *HCSCRC* takes the value of 1 if the firm discloses all three categories of IC information in its annual report, and 0 otherwise. *MB* is the market-to-book ratio at the end of the quarter in which firms release the annual report. *AE* is the absolute value of the difference between the analyst consensus and the actual value, divided by book value. *SDROE* is the standard deviation of the return on equity over the past five years. *DR* is the debt ratio at the end of the quarter in which firms release the annual report.

## **Chapter 5: Human Capital Disclosure, Accounting Numbers, and Share Price**

### **1. Introduction**

In the late 1990s, several researchers claimed that based on statistical evidence from the 1980s and 1990s, the quality of accounting information had decreased (Gröjer and Johanson, 1997; Lev and Zarowin, 1999). They argued that accounting's importance declined because the current accounting system does not reflect the firm's intrinsic value (Lev and Zarowin, 1999; Fulmer and Ployhart, 2014). The problem derives not only from accounting itself but also from other factors such as potential increases in uncertainty in society or in the financial markets (Ballester et al., 2002). It is therefore worthwhile to consider what the field of accounting can do to increase the quality of information. While many accounting researchers have suggested various solutions, none have reached an acceptable one (Fulmer and Ployhart, 2014).

Lev and Zarowin (1999) demonstrated that the business environment changes faster than it did in the past. Intangibles not on the balance sheet have relationships with those changes and the decreased quality of accounting numbers (Lev and Zarowin, 1999). Gröjer and Johanson (1997) more specifically pointed out that the lack of information about employees causes the problem. However, the current accounting system (IAS 38)

does not allow unidentifiable assets to be reported on the balance sheet.

Academics in the mid-1990s identified intellectual capital (IC) similarly to intangibles and classified this as human capital (HC), structural capital (SC), and relational capital (RC) (Mouritsen, 1998). HC represents the knowledge that employees take with them when they leave the organization (Mouritsen, 1998). SC refers to the knowledge that stays within the firm at the end of the working day (Mouritsen, 1998). RC refers to the knowledge embedded in the relationships external to the organization (Mouritsen, 1998). In the early 2000s, some developed countries, including Sweden, Denmark, and Japan, introduced intellectual capital reporting guidelines to promote management and disclosure of these intangibles (DMSTI, 2003; Meritum, 2002; METI, 2004). In addition, the International Integrated Reporting Council (IIRC) released the international IR Framework as a more comprehensive guideline for corporate disclosure (IIRC, 2013). In practice, IC is partly disclosed via annual or standalone reports.

However, the content of and how to disclose IC is still under discussion. Since an IC based approach to accounting for HC identifies top management or employees as the essential source of value creation and innovation in all organizations (Nonaka and Takeuchi, 1995; Roslender, 2009), focusing on HC is a primary issue in disclosure studies.

According to Gamerschlag (2013), a German firm's voluntary HC information<sup>24</sup> is associated with its share price, while an HC disclosure study in Japan reports the insufficiency of HC disclosure for valuation purposes (Sakakibara et al., 2010). The discrepancy between these studies may be caused by an improvement enacted after 2010, although it is also possibly because firms in Germany and Japan have different incentives to voluntarily disclose HC information.

An et al. (2011) integrated four IC disclosure theories (agency theory, stakeholder theory, legitimacy theory, and signalling theory) and advocated three incentives for voluntary disclosure: to reduce information asymmetry, to discharge accountability, or to signal legitimacy or excellence. The traditional value-relevance studies examined whether information asymmetry was reduced by voluntary disclosure but have not sufficiently tested the other incentives in An et al.'s (2011) integrated theory. This study focuses on all three incentives and empirically examines which incentives can explain the discrepancy between the previous HC disclosure studies in Germany and Japan.

This chapter shows which company characteristics affect voluntary HC disclosure and whether the voluntary HC information is value-relevant. This study finds statistical

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<sup>24</sup> Voluntary HC information is defined as information related to employees' knowledge that is voluntarily disclosed in an annual report or a standalone report. The information is currently not legally required in Japan or Germany.

evidence for relationships between the amount of voluntary HC information disclosure and the average salary and the number of employees. Therefore, incentives for Japanese firms to voluntarily disclose HC information should include both reducing information asymmetry between managers and investors and discharging accountability or signalling legitimacy or excellence to their (potential) employees.

The rest of the chapter is structured as follows. Section 2 describes a brief literature review of HC in terms of both financial information and non-financial information. Section 3 introduces a theory related to voluntary IC disclosure and the hypotheses deduced from the theory. Section 4 explains the research methods used to test the hypotheses. Section 5 presents the basic statistics of the sample and the content analysis. Section 6 illustrates the results of the analyses, while Section 7 discusses the study's contributions and limitations.

## **2. Literature review**

### ***2-1. Capitalization or expenditure***

In the 1920s, Paton (1922) stated that well-organized and loyal personnel cannot be recognized as specific economic assets. The information provided about the company's employees was recognized as a serious limitation of the conventional balance sheet (Paton, 1922). A few decades later, some researchers suggested models to evaluate the value of

an individual or a group of employees<sup>25</sup> (Flamholtz, 1971; Hermanson, 1964; Lev and Schwarz, 1971; Morse, 1973). In addition, some researchers found empirical evidence<sup>26</sup> that information related to human resource costing and accounting is relevant for investors (Elias, 1972; Hendricks, 1976; Schwan, 1976).

However, there has been discussion about whether intangibles, including HC, can be recognized as assets. Lev (2001) defined intangible assets as nonphysical sources of value (claims to future benefits) generated by innovation (discovery), unique organizational designs, or human resource practices. According to this definition, parts of HC could be regarded as assets if they are identifiable and measurable (Samudhram et al., 2008)<sup>27</sup>. Moreover, Hansson (1997) showed that an increasing dependence on investment in employees is followed by a rise in abnormal return. Therefore, he concluded that investors need accounting information about HC to help improve investment decisions.

On the other hand, Penman (2007) argued that ‘missing (intangible) assets in the balance sheet are no problem (for valuation) if the earnings from those assets are reported in the income statement’. In addition, market value estimation using a model might violate

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<sup>25</sup> In this period, the definition of value of employees is not the same as the definition of HC in this study. Those values sometimes included SC or RC in the current sense.

<sup>26</sup> This research took an experimental approach as it was limited by data availability.

<sup>27</sup> In fact, there were a few cases where several employees were recognized as assets in the past (e.g. The Milwaukee Braves 1962-1965 and The Flying Tiger Line 1966-1967).

the reliability of reporting (Penman, 2007). Furthermore, given that knowledge can be mobilized to create effects, it may be important to think of how IC relates to value rather than identifying its specific value (Mouritsen, 2006).

In current practice, IAS 38 covers the treatment of intangibles and does not allow capitalization of intangibles that are not identifiable or reliably measurable. HC, by definition, is knowledge that employees take with them when they leave the firm. Knowledge can be mobilized, as Mouritsen (2006) explained, and this characteristic hinders properly identifying HC. Some previous literature might provide a theoretical framework for measuring HC (Flamholtz, 1971; Hermanson, 1964; Lev and Schwarz, 1971; Morse, 1973), but they have not sufficiently overcome the issue. Furthermore, in practice, explicit and tacit knowledge (Nonaka and Takeuchi, 1995) are almost impossible to distinguish. As accounting standards setters have not provided guidelines for intellectual capital, there was also a shift toward other sources of information, such as annual reports or other standalone reports that provide non-financial information (Fulmer and Ployhart, 2014).

## ***2.2 Non-financial information***

Besides a discussion about the capitalization of intangibles, another approach discloses information about employees in the annual report or stand-alone report through

non-financial information. A scoreboard approach was introduced for measuring and reporting IC information, and a narrative-based approach was developed in the 1990s and 2000s (Roslender, 2009). However, companies may decide how much information to report, as disclosure in these reports is mostly voluntary. Yau et al. (2009) found that the IC disclosure behaviour of publicly-listed companies might be explained by both economic and non-economic characteristics. Some surveys show that there is relatively little HC-related information in annual reports, but that it has been gradually increasing in some parts of the developed world (Wyatt and Frick, 2010; Gamerschlag, 2013).

What factors influence a company's disclosure of HC information? The need for financing from the capital market leads to voluntary disclosures, especially in those countries that depend on the capital market (Francis et al., 2003). Indeed, some theoretical studies show that outside financing motivates a company to disclose information voluntarily to reduce information asymmetry and, in turn, the cost of capital (Kim and Verrecchia, 1994). Clarifying the information about firm specific HC investments is necessary to reduce the cost of capital and indicate the company's growth opportunities (Wyatt and Frick, 2010). Gamerschlag (2013) found empirical evidence that information about employees' qualifications and competence is positively related to stock prices.

Policy makers and individual employees also have demands for HC information.



Since education, employment, and training underlie the growth of HC and technology, governments must refer to compensation and other input and output data to evaluate policies (Wyatt and Frick, 2010). Both current and potential employees require information about the company's HC policy and practices, so they can make decisions after thorough consideration (Hansson, 2004). It is essential to disclose this information to attract talented employees (Hansson, 2004).

Disclosing HC information also has potentially negative consequences. As Wyatt and Frick (2010) pointed out, disclosing confidential information might cost the company its competitive advantage, such as confidential information about products (Healey and Palepu, 1993). Although the evidence does not concern HC information, the same argument can be applied to a similar type of confidential information.

### **3. Research questions and hypotheses**

An et al. (2011) provided an integrated theoretical framework for voluntary IC disclosure practice. The framework is explained by interrelating and underpinning agency theory, stakeholder theory, signalling theory, and legitimacy theory (An et al., 2011). The concept provides three key premises for voluntary IC disclosure (An et al., 2011):

(1) To reduce the information asymmetry between an organization's management and various societal stakeholders.

(2) To discharge accountability to various stakeholders.

(3) To signal organizational legitimacy and excellence (or superior quality) to society.

Many empirical studies have investigated the relationship between HC information and market reactions (Elias, 1972; Gamerschlag, 2013; Gröjer and Johanson, 1997; Hansson, 1997; Hendricks, 1976; Schwan, 1976). Some may provide empirical evidence to support premise (1), because they focus on the impact on investors. On the other hand, several researchers found that current HC disclosure practices do not provide sufficient information to analysts or investors (Wyatt, 2008; Sakakibara et al., 2010). In addition, the previous literature focuses on premise (1) rather than all three premises, and so has not sufficiently examined An et al.'s (2011) integrated theory using actual data.

Two research questions follow from the previous discussion.

Question 1: Is voluntary HC information value-relevant?

Question 2: What company incentives are associated with the amount of voluntary HC disclosure?

Gamerschlag (2013) studied value-relevance using the top 130 listed firms in Germany as a sample. Therefore, Question 1 verifies whether random sampling in Japan returns the same results. Regardless of its value-relevance, the association between the amount of voluntary HC information and share price is a black box, potentially opened by clarifying the association between the related accounting numbers and required HC

information. Question 2 attempts to reveal unknown corporate behaviour related to voluntary HC disclosure. In addition, premises (2) and (3) require more focus on the relationship between the amount of HC information and the firm's characteristics rather than the impact on investors. Therefore, this study investigates the validity of premises (2) and (3) from the employees' point of view. To obtain this evidence, this study examines the following five hypotheses:

**Hypothesis 1:** Voluntary HC information is value-relevant.

**Hypothesis 2:** The greater the number of employees, the greater the amount of HC information voluntarily disclosed by firms.

**Hypothesis 3:** The greater the compensation employees receive, the greater the amount of HC information voluntarily disclosed by firms.

**Hypothesis 4:** The younger the average age of employees, the greater the amount of HC information voluntarily disclosed by firm.

**Hypothesis 5:** The longer the employees' tenure, the greater the amount of HC information voluntarily disclosed by firms.

Hypothesis 1 is a confirmation of Gamerschlag's (2013) finding. Hypotheses 2 to 5 describe the associations between companies' HC profiles and the amount of voluntary HC information. Since the number of employees, average salary, average age, and

average tenure are required information in the annual securities report<sup>28</sup>, these numbers are chosen as proxies for HC profile. Hypothesis 2 is derived from premise (2). Companies with more employees have more stakeholders. Hypotheses 3, 4, and 5 can be deduced from premise (3)<sup>29</sup>. Higher salaries or longer employee tenure can be interpreted as organizational legitimacy or excellence. However, average age is controversial, because older employees will have more experience, but may be less innovative<sup>30</sup>. In Japan, the traditional lifetime employment and seniority system is sometimes regarded as a problem for companies with relatively high average ages. During recessions, those companies must maintain the salary standards for experienced workers, and, in turn, reduce salaries for new or younger workers. Therefore, in this study, a younger average age is expected to represent organizational excellence from the labour market point of view.

## **4. Methods**

### ***4-1. Regression analyses***

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<sup>28</sup> An annual securities report is required for all listed companies in Japan by the Financial Instruments and Exchange Act Article 24. The content is specified by Cabinet Office Ordinance on Disclosure of Corporate Information.

<sup>29</sup> These hypotheses can be deduced from premises (1) or (2). Since testing An et al.'s (2011) proposed theory would be of interest in this study, an explanation is provided by allocating each premise to the hypothesis in a manner that should make them easily understood.

<sup>30</sup> Whether one is innovative depends on environment or motivation; therefore, age should be regarded as one of the factors in this context.

Traditional value-relevance research is based on OLS and attempts to observe the relationship between the variable of interest and the dependent variable or sometimes  $R^2$  (Barth et al., 2001). Gamerschlag (2013) tested the value-relevance of share price and HC information with a sample of the largest 130 listed companies from the German market between 2005 and 2008. To check value-relevance (Hypothesis 1), Gamerschlag's (2013) OLS model was replicated with a sample from the Japanese market. Since Japan is one of the few countries that have introduced IC disclosure guidelines, Japan and Germany have a similar reporting environment. However, Germany and Japan have differences in their HC and financial systems. It is entirely possible that the results between countries will vary. Assuming that Ohlson's (1995) model holds, the following models were investigated to test Hypothesis 1:

$$(SP) = \alpha_1 + \alpha_2(BV) + \alpha_3(NI) + \alpha_4(HCTOTAL/page) + (Industry) + \varepsilon \quad (1)$$

$$(SP) = \alpha_1 + \alpha_2(BV) + \alpha_3(NI) + \alpha_4(HCQC) + \alpha_5(HCMC) + \alpha_6(HCPS) + (Industry) + \varepsilon \quad (2)$$

SP represented the stock price at the end of the quarter in which the firm's financial statements were made available. *BV* was the book value divided by the number of shares, and *NI* was net income divided by the number of shares. *HCTOTAL/page* was the total frequency for each keyword listed in Table 5-1 divided by the number of pages. The keywords in English were the same as those in Gamerschlag (2013) and were classified

into qualification/competence, motivation/commitment, and personnel. The keywords in qualification/competence related to the amount of knowledge employees have acquired. Those in motivation/commitment represented how well a firm utilizes employees' knowledge, while those in personnel basically described what a firm does to attract potential employees. The counting method was also similar to Gamerschlag (2013), except that the language used is Japanese rather than English<sup>31</sup>. Therefore, some translated words were allocated to each keyword. *HCQC*, *HCMC*, and *HCPS* were the total number of frequencies for each keyword in the categories of qualification/competence, motivation/commitment, and personnel, respectively. The Industry variables were dummy variables.

Regression (1) was a replication of Gamerschlag (2013) to enable a comparison. Regression (2) focused on the value-relevance of the content of voluntary HC information in terms of its amount. Hence, in the regression, HC information was not divided by the number of pages.

■insert Table 5-1 here■

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<sup>31</sup> There are four types of Japanese firms' voluntary disclosure: disclose only in Japanese, disclose only in English, disclose in both Japanese and English, and no disclosure. Since most firms in the sample disclose only in Japanese, text mining was done in Japanese, and excluded English disclosures. However, this omission should not affect the results significantly, because few companies disclosed only in English and most companies that publish both in Japanese and English disclose reports with more pages in Japanese. Regarding content, Japanese reports are assumed to include the contents of the English reports.

#### ***4-2. Graphical modelling***

Traditional regression models do not provide output describing the relationships among various types of information. It is possible that the information in financial statements, the required HC information in the security report, the voluntary HC information in the annual reports, and market data are all related to each other. The causal effects might be too complicated to investigate but clarifying the relationships should be useful to support decision making for all stakeholders. A graphical modelling method can be used to describe the relationship of many variables as a graph that consists of vertices and edges (Edwards, 1995). The vertices represent the random variables. The edges express the partial correlation of two variables given the other. Therefore, if there is no edge between two vertices, the two variables are conditionally independent given the other variables.

Although graphical modelling is an exploratory approach, it can be used for testing hypotheses by comparing the hypotheses and the output graphs. As opposed to regression models where a relationship between related variables is assumed in advance, graphical models do not assume a certain relationship. The relationship between variables is not always known based on existing theory, though in reality the association between certain variables are known. In this study, the relationship between the amount of voluntary HC

information and the companies' HC profile can be taken from An et al. (2011), but the relationship of these variables with accounting numbers and share price is difficult to assume using existing theories. Therefore, graphical modelling is one way to overcome this difficulty.

Some researchers believe that graphical modelling may be a cumbersome method, since it must be run repeatedly to test whether deleting an edge would give a better model. However, recent developments in theory and software such as R (Højsgaard et al., 2012) enable testing with this method by writing some code. Therefore, in terms of implementation, graphical modelling is not as time consuming as traditional regressions or simulations.

The amount of HC information was similar to that of the regression model, but not divided by the number of pages. The amount of HC information per page might be a measure of how a firm stresses the importance of HC information. However, the total amount of HC information (*HCTOT*) should be considered to test the hypotheses, because the hypotheses describe the relationship between the amount of information and the companies' characteristics.

The number of employees (*NOE*), the average salary (*AvrSal*), average age (*AvrAge*), and average tenure (*AvrYS*) are required in the securities report. These the numerical



variables were used to simultaneously test hypotheses 2 through 5. Employees receive both salaries and benefits (*EB*), retirement benefits (*RB*), or stock options, among others. To test the hypotheses, these accounting numbers were included in the graphical model, except the value of stock options, as their value depends on a fluctuating share price. In addition, the variables used in the regression model were included in the graphical model. Comparing Ohlson's (1995) model to a graphical model will provide meaningful information to help interpret the results.

Since the model included both discrete and continuous variables, 'a mixed interaction model' (Højsgaard et al., 2012) was used with the statistical software package R. The method assumes homogeneity, meaning that the covariance matrix of continuous variables does not depend on the values of discrete variables (Højsgaard et al., 2012). The gRim package was used to implement this analysis.

The model selection starts with the saturated model<sup>32</sup>, a graph where every vertex is connected by an edge to the others. The method is a heuristic search using the well-known model selection criteria of penalized likelihood type (Højsgaard et al., 2012). For the penalty parameter, both Akaike's information criterion (AIC) and the Bayesian

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<sup>32</sup> There is also a forward approach where the model selection starts from no edge between any pairs of variables.

information criterion (BIC) were used, as in Højsgaard et al. (2012). The search is implemented by deleting edges and continues until a model is found that minimises the penalised likelihood. If there is no edge that decreases the penalised likelihood by deleting it, the process stops.

## **5. Sample and content analysis**

In terms of number of listed companies, Japan is one of the largest countries that have released IC reporting guidelines. The securities report requires employee information such as average salary and number of employees. In terms of comparisons with the previous German study, Japan has similarities in GDP, population, and leading industries (such as automobiles). However, Germany and Japan have different labour systems (Jackson and Moerke, 2005). For instance, Germany has industry-wide labour unions, and so compensation for similar jobs does not vary among companies. In contrast, Japan has only internal labour unions, so compensation varies among companies. In addition, Japan also has a traditional lifetime employment system. Therefore, Japanese firms are expected to be more employee-conscious than those in other countries. These differences might influence firms' HC disclosure behaviour. Therefore, Japan is a suitable sample country for comparison and testing the hypotheses.

The sample was selected using the stratified random sampling method. At the end of October 2013, 1755 firms were listed in the first section of the Tokyo Stock Exchange,

with 744 firms listed in the second section and the market for high-growth and emerging stocks (Mothers). By dividing the population of companies by industry, a random collection of one tenth of the firms from each industry were taken as the sample. The final selection included 177 and 76 firms from the first section and the second section and Mothers, respectively.

The period of focus was the year from October 2012 to September 2013. The amount of HC information was the total frequency for each keyword listed in Table 5-1. To avoid human error, the RMeCab package for R software was used to count the frequencies in Japanese. Since it can process only text format documents, PDF format annual reports downloaded from each firm's IR website were transformed to a text format. The average salary, average tenure, and average age data were collected from each firm's securities report. The number of employees was also collected from that report, but consolidation-based data were used in this analysis. The accounting information was collected from Nikkei NEEDS Financial Quest2.0. Share price was the share price at the end of the quarter when the firm published its financial statements and was collected from Thomson Reuters DataStream.

Table 5-2 summarizes the basic statistics for each variable. In the data collection process, three firms did not have data for average salaries or the number of employees.

Therefore, the final sample size includes 250 firms. Regarding content, qualification/competence information is disclosed more frequently on average than the other categories. Personnel information occupies second place, while less than one keyword for each firm is disclosed for motivation/commitment information.

Table 5-3 shows Pearson's and Spearman's correlation coefficients for the variables in the regression analyses. However, there is a high association between net income and book value. The purpose of the regression is to replicate and compare Gamerschlag's (2013) study, so Ohlson's (1995) model will be maintained by assuming that no perfect multi-collinearity exists. In addition, as Gamerschlag's (2013) study found, there are positive relationships between each category of HC information.

■insert Table 5-2 here■

■insert Table 5-3 here■

## **6. Results**

### ***6-1. Regression model results***

Table 5-4 shows the results for regression model (1). The p-value for HCTOTAL/page is not significant. The results differ from those of Gamerschlag (2013), who reports a significant association between the amount of a firm's voluntary HC information and its share price. In Japan, this regression shows no evidence for an association between HC information and share price. The difference might be explained

by the difference in the samples. The listed firms in this study were selected from the Tokyo Stock Exchange using the stratified random sampling method while Gamerschlag's (2013) sample was composed of the 130 largest listed German companies.

Table 5-5 shows the result for regression model (2). None of the coefficients for *HCQC*, *HCMC*, and *HCPS* are significant. Hypothesis 1 is not supported by the regressions. Gamerschlag (2013) found that *HCQC* was value-relevant; however, this study finds different results, though the variables were not divided by the number of pages. The difference in the sampling methods and cultures might help explain the results, but a detailed comparison is beyond the aim of this study and is left for future research.

In the graphical modelling results, the firm characteristics that were associated with the amount of voluntary HC information in Japan were investigated. The analysis provides some evidence that Japanese companies have incentives for disclosing HC information to discharge their accountability or to signal their excellence and legitimacy to their (potential) employees.

■insert Table 5-4 here■

■insert Table 5-5 here■

## ***6-2. Graphical modelling results***

Figures 5-1 and 5-2 show the undirected graphical model results with all HC

information. Since BIC put more stringent parameters on the penalized likelihood, the graph in Figure 5-2 is simpler than that in Figure 5-1. Both graphs show partial correlation between the amount of HC information and the average salary and number of employees. The results are consistent with hypotheses 2 and 3, but not with hypotheses 4 and 5. Therefore, the empirical evidence partially supports An et al.'s (2011) theory. The greater the number of employees, the greater the accountability required of a firm. Consequently, the firm increases its amount of voluntary HC disclosure to discharge its accountability (premise (2)). In addition, the higher the compensation a firm provides, the better treatment it should offer to its employees. The result can be interpreted as a means for a firm to signal its excellence to (potential) employees by increasing the amount of voluntary HC information (premise (3)). The results also imply that HC information is conditionally independent of the share price given the average salary and the number of employees. This might suggest that Gamerschlag (2013) possibly observed an indirect association between share price and voluntary HC information.

These results differ from those of Gamerschlag (2013) and describe the detailed relationships for the previous regression. In both graphs, the book value per share, average salary, and number of employees separates the amount of HC information from the share price. Hence, if there are two companies whose book value, average salary, and number

of employees are the same, their amount of HC information and share price should be independent of each other. However, there are some paths from *HCTOT* to *SP*, so there are some indirect associations between the amount of HC information and the share price.

Figures 5-3 and 5-4 show the results of the undirected graphical model with the amount of classified HC information. Both graphs show a partial correlation between each class of HC information, suggesting that once companies decide to disclose HC information, they disclose all categories of HC information. Figure 5-4 also shows a partial correlation between the number of employees and the amount of information about qualifications/competence or employees. Moreover, it shows a partial correlation between the average salary and employees. Therefore, companies might disclose HC information to appeal to the labour market rather than financial market.

■insert Figure 5-1 here■

■insert Figure 5-2 here■

■insert Figure 5-3 here■

■insert Figure 5-4 here■

One of the limitations of graphical models is that the outputs do not show whether the associations are positive or negative. In hypotheses 2 to 5, the signs of the correlations are also of interest in this study. One method to check the signs is to calculate a partial correlation matrix from a correlation matrix. Tables 5-6 and 5-7 show the variables' partial

correlation matrices (without *Industry* dummy) used in the graphical model. Table 5-6 shows that the partial correlation between the total amount of voluntary HC information and number of employees (average salary) is 0.50 (0.16). Table 5-7 presents the partial correlation with the classified HC information. The partial correlations described by hypotheses 2 and 3 are confirmed to be positive.

■insert Table 5-6 here■

■insert Table 5-7 here■

## **7. Conclusion**

### ***7-1. Discussion***

This chapter uses statistical methods to show the relationships of the amount of voluntary HC information with required HC information as well as the share price. This study offers the following three contributions:

- (1). Statistical evidence shows that the amount of voluntary HC information is related to the number of employees and average salary.
- (2). The findings question the value-relevance between share price and the amount of voluntary HC disclosures in a country where a firm has significant accountability toward employees.
- (3). It provides an example showing how graphical modelling methods can complement traditional OLS methods.



Contribution (1) provides a significant implication for An et al.'s (2011) theory, because it implies that a firm discloses HC information voluntarily to discharge its accountability toward its (potential) employees or to signal its excellence or legitimacy. Therefore, this study provides new evidence about HC disclosure behaviour.

Contribution (2) does not mean that voluntary HC disclosure is useless for investors, but it implies that the results of value-relevance studies vary depending on sampling methods or countries. The company size or industry included in a sample, or the type of labour system a country has might impact the results. However, the primary purpose of an integrated report is to explain to the providers of financial capital (investors and creditors of companies) how an organization creates value (IIRC, 2013). Even if the information is important for employees, managers should not forget its primary purpose. This reversal phenomenon might suggest an argument about the priority among stakeholders in An et al.'s (2011) theory.

While contribution (3) may not be the main purpose of this study, using graphical modelling allows a demonstration of how to investigate disclosure behaviours in a complex environment. Since each method has its own strengths and weaknesses, making use of various methods potentially offers differing viewpoints and reveals new information.

This study is subject to several limitations. First, undirected graphical modelling does not describe the causal effects of the variables. Chain graph modelling might describe a causal effect, but it is appropriate only when it is clear some variables precede or explain others (Højsgaard et al., 2012). This study deals with 13 variables at most, providing 78 pairs. It is not realistic to assume the directions for all pairs. Second, due to data constraints, the sequential or cultural change in voluntary HC disclosure is not yet described. This study's sample comes from a one-year period and a single country, so the result is inevitably affected by the impact of time and culture.

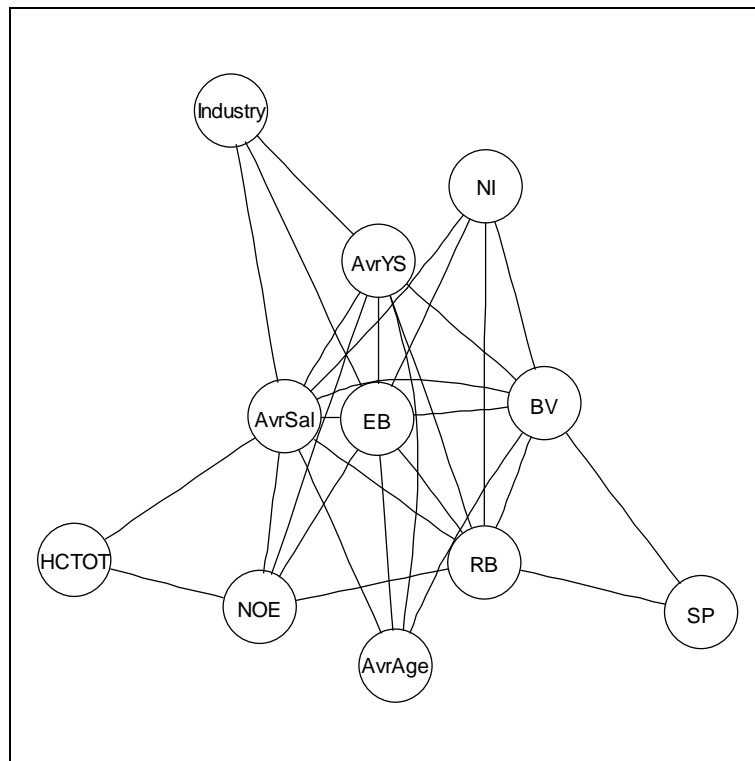
### ***7-2. Scope for future research***

This study focuses on the relationship between the amount of voluntary HC disclosure and the labour and financial markets. However, in the IC reporting framework, the relationships between the amount of SC or RC information and companies' characteristics is yet unknown. Based on An et al.'s (2011) integrated theory, there should be several other complicated relationships between corporate disclosure, stakeholders, and economic consequences. How companies deal with IC reporting as a whole in practice should be monitored to improve the integrated reporting guidelines and users' understanding of the information. Therefore, it is worth investigating which company characteristics are associated with the amount of SC or RC information and what

outcomes besides financial market indices should be measured to determine the impact of disclosing IC information.

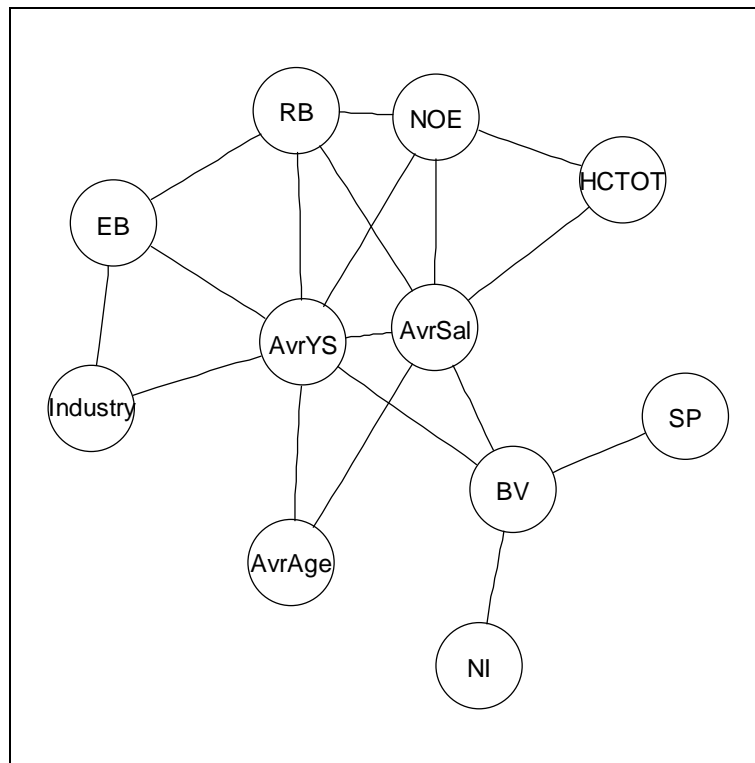
The differences in the results for Japan and Germany may stem from the differences in cultures or institutions. For example, the lifelong employment system in Japan might lead Japanese companies to believe relationships with employees are more important than relationships with investors. Investigating different countries' human capital practices and their impact on disclosure behaviour could provide a worthwhile international comparison.

**Figure 5-1: Undirected graphical model of HC information with AIC**



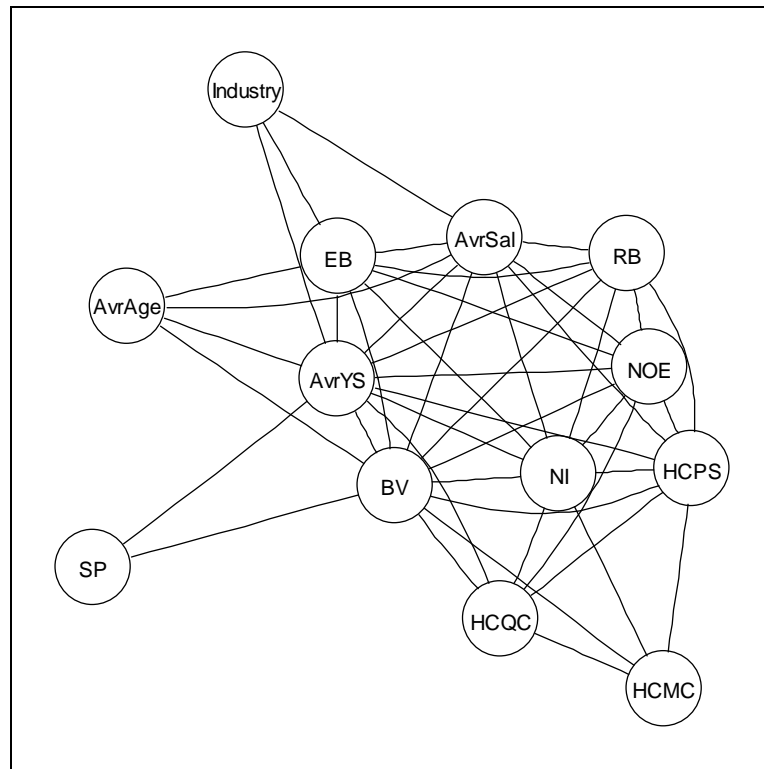
**SP**: Share price at the end of the quarter that firms published their annual reports. **BV**: Book value divided by the number of shares. **NI**: Net income divided by the number of shares. **AvrSal**: Average Salary of permanent employees. **NOE**: Number of employees (consolidated basis). **EB**: Employee benefit expense divided by the number of employees. **RB**: Retirement benefit expense divided by the number of employees. **AvrYS**: Average tenure of permanent employees. **AvrAge**: Average Age of permanent employees. **HCTOT**: Sum of frequencies of each keyword in Table 5-1.

**Figure 5-2: Undirected graphical model of HC information with BIC**



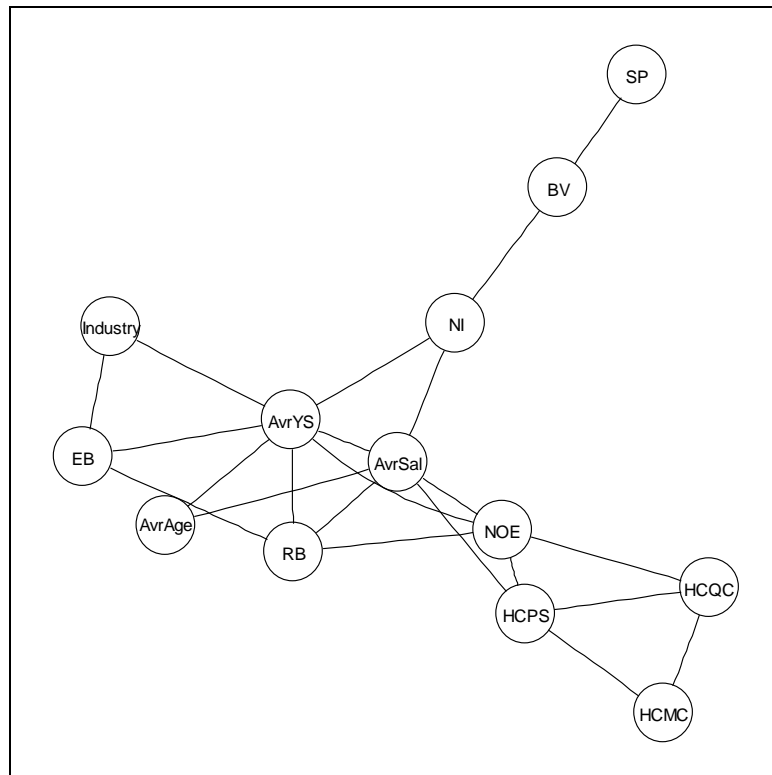
**SP:** Share price at the end of the quarter that firms published their annual report. **BV:** Book value divided by the number of shares. **NI:** Net income divided by the number of shares. **AvrSal:** Average Salary of permanent employees. **NOE:** Number of employees (consolidated basis). **EB:** Employee benefit expense divided by the number of employees. **RB:** Retirement benefit expense divided by the number of employees. **AvrYS:** Average tenure of permanent employees. **AvrAge:** Average Age of permanent employees. **HCTOT:** Sum of frequencies of each keyword in Table 5-1.

**Figure 5-3: Undirected graphical model of classified HC information with AIC**



**SP**: Share price at the end of the quarter that firms published their annual report. **BV**: Book value divided by the number of shares. **NI**: Net income divided by the number of shares. **AvrSal**: Average Salary of permanent employees **NOE**: Number of employees (consolidated basis). **EB**: Employee benefit expense divided by the number of employees. **RB**: Retirement benefit expense divided by the number of employees. **AvrYS**: Average tenure of permanent employees. **AvrAge**: Average Age of permanent employees. **HCQC**: Sum of frequencies of each keyword classified as Qualification/competence in Table 5-1. **HCMC**: Sum of frequencies of each keyword classified as Motivation/commitment in Table 5-1. **HCPS**: Sum of frequencies of each keyword classified as Personnel in Table 5-1.

**Figure 5-4: Undirected graphical model of classified HC information with BIC**



**SP**: Share price at the end of the quarter that firms published their annual report. **BV**: Book value divided by the number of shares. **NI**: Net income divided by the number of shares. **AvrSal**: Average Salary of permanent employees. **NOE**: Number of employees (consolidated basis). **EB**: Employee benefit expense divided by the number of employees. **RB**: Retirement benefit expense divided by the number of employees. **AvrYS**: Average tenure of permanent employees. **AvrAge**: Average Age of permanent employees. **HCQC**: Sum of frequencies of each keyword classified as Qualification/competence in Table 5-1. **HCMC**: Sum of frequencies of each keyword classified as Motivation/commitment in Table 5-1. **HCPS**: Sum of frequencies of each keyword classified as Personnel in Table 5-1.

**Table 5-1: Content analysis keywords (Gamerschlag, 2013)**

<b>Category</b>	<b>Keywords</b>	
<b>Qualification/competence</b>	Brain power	
	Competence	
	Competencies	
	Education	
	Expertise	
	Intangible skills	
	Intelligence	
	Know-how	
	Knowledge	
	Learning	
	Qualification	
	Specialist	
	Training	
	<b>Motivation/commitment</b>	Absence
Career		
Employee retention		
Employee satisfaction		
Employee turnover		
Entrepreneurial spirit		
Motivation		
Staff turnover		
<b>Personnel</b>		Diversity
		Empowerment
	Human resource	
	Personnel	
	Recruiting	
Recruitment		



**Table 5-2: Summary statistics for regression model (1)**

	<i>Min</i>	<i>Max</i>	<i>Mean</i>	<i>Median</i>	<i>SD</i>
<i>SP (yen)</i>	9	156600	1814	506	10704
<i>BV (million yen/share)</i>	-213	99577	1473	596	6621
<i>NI (million yen/share)</i>	-864	6944	71	30	462
<i>EB (yen/ employee)</i>	0	14890785	3063434	2315836	2563726
<i>RB (yen/ employee)</i>	-724942	1941177	360638	301667	308421.2
<i>AvrSal (yen/employee)</i>	935483	14445000	6056747	5854009	1483113
<i>NOE (people)</i>	32	64635	4055	964	9356
<i>AvrYS (tenure)</i>	1.1	26.4	13.6	14.8	5.3
<i>AvrAge (age)</i>	21.4	52	40.0	40.6	4.0
<i>HCQC ( frequencies)</i>	0	217	16.3	1	37.4
<i>HCMC (frequencies)</i>	0	16	0.7	0	2.1
<i>HCPS (frequencies)</i>	0	161	7.3	1	17.9
<i>HCTOT (frequencies)</i>	0	306	24.3	2.5	53.0
<i>HCTOTP (frequencies/ page)</i>	0	6.8	0.8	0.3	1.3

*SP*: Share price at the end of the quarter that firms published their annual report. *BV*: Book value divided by the number of shares. *NI*: Net income divided by the number of shares. *EB*: Employee benefit expense divided by the number of employees. *RB*: Retirement benefit expense divided by the number of employees. *AvrSal*: Average Salary of permanent employees. *NOE*: Number of employees (consolidated basis). *AvrYS*: Average tenure of permanent employees. *AvrAge*: Average Age of permanent employees. *HCQC*: Sum of frequencies of each keyword classified as Qualification/competence in Table 5-1. *HCMC*: Sum of frequencies of each keyword classified as Motivation/commitment in Table 5-1. *HCPS*: Sum of frequencies of each keyword classified as Personnel in Table 5-1. *HCTOT*: Sum of frequencies of each keyword in Table 5-1. *HCTOTP*: HCTOT divided by the number of pages of the annual report.

**Table 5-3: Pearson's and Spearman's correlation coefficient for regression models (1) and (2)**

	<b>SP</b>	<b>BV</b>	<b>NI</b>	<b>HCTOTP</b>	<b>HCQC</b>	<b>HCMC</b>	<b>HCPS</b>
<b>SP</b>	1.00	0.71	0.78	0.14	0.15	0.16	0.10
<b>BV</b>	0.88	1.00	0.64	0.10	0.07	0.14	0.11
<b>NI</b>	0.92	0.95	1.00	0.17	0.17	0.13	0.11
<b>HCTOTP</b>	-0.04	-0.03	-0.03	1.00	0.91	0.56	0.87
<b>HCQC</b>	-0.02	-0.01	-0.00	0.69	1.00	0.56	0.83
<b>HCMC</b>	-0.01	0.02	-0.01	0.51	0.73	1.00	0.56
<b>HCPS</b>	-0.02	0.02	0.01	0.55	0.69	0.67	1.00

\* The upper triangle shows Spearman's correlation coefficient and the lower triangle shows Pearson's correlation coefficient.

**SP**: Share price at the end of the quarter that firms published their annual report. **BV**: Book value divided by the number of shares. **NI**: Net income divided by the number of shares. **HCTOTP**: HCTOT divided by the number of pages of the annual report. **HCQC**: Sum of frequencies of each keyword classified as Qualification/competence in Table 5-1. **HCMC**: Sum of frequencies of each keyword classified as Motivation/commitment in Table 5-1. **HCPS**: Sum of frequencies of each keyword classified as Personnel in Table 5-1.

**Table 5-4: Result for regression model (1)**

<b>Coefficients</b>	<b>Estimate</b>	<b>Std. Error</b>	<b>t-value</b>	<b>p-value</b>
<b>(Intercept)</b>	-826.8374	1318.5175	-0.627	0.5312
<b>BV</b>	1.4519	0.1299	11.179	<2e-16****
<b>NI</b>	0.6581	1.8669	0.353	0.7248
<b>HCTOTP</b>	-103.2000	208.1341	-0.496	0.6205
<b>Industry Dummy</b>			Yes	
<b>Adjusted R<sup>2</sup></b>			0.8515	

**Significance codes:** 0 '\*\*\*\*' 0.001 '\*\*\*' 0.01 '\*\*' 0.05 '\*' 0.1

*SP*: Share price at the end of the quarter that firms published their annual report. *BV*: Book value divided by the number of shares. *NI*: Net income divided by the number of shares. *HCTOTP*: HCTOT divided by the number of pages of the annual report.

**Table 5-5: Result for regression model (2)**

<b>Coefficients</b>	<b>Estimate</b>	<b>Std. Error</b>	<b>t-value</b>	<b>p-value</b>
<b>(Intercept)</b>	-878.1977	1328.5045	-0.661	0.509
<b>BV</b>	1.4638	0.1319	11.096	<2e-16 ****
<b>NI</b>	0.5001	1.8950	0.264	0.792
<b>HCQC</b>	-5.4457	11.8075	-0.461	0.645
<b>HCMC</b>	84.9536	196.0273	0.433	0.665
<b>HCPS</b>	1.2897	22.7828	0.057	0.955
<b>Industry Dummy</b>			Yes	
<b>Adjusted R<sup>2</sup></b>			0.8502	

**Significance codes:** 0 '\*\*\*\*' 0.001 '\*\*\*' 0.01 '\*\*' 0.05 '\*' 0.1

*SP*: Share price at the end of the quarter that firms published their annual report. *BV*: Book value divided by the number of shares. *NI*: Net income divided by the number of shares. *HCQC*: Sum of frequencies of each keyword classified as Qualification/competence in Table 5-1. *HCMC*: Sum of frequencies of each keyword classified as Motivation/commitment in Table 5-1. *HCPS*: Sum of frequencies of each keyword classified as Personnel in Table 5-1.

**Table 5-6: Partial correlation matrix for graphical model with HCTOT**

	<b>SP</b>	<b>BV</b>	<b>NI</b>	<b>Avr Sal</b>	<b>NOE</b>	<b>EB</b>	<b>RB</b>	<b>Avr YS</b>	<b>Avr Age</b>	<b>HC TOT</b>
<b>SP</b>	1.00									
<b>BV</b>	0.58	1.00								
<b>NI</b>	0.04	0.75	1.00							
<b>AvrSal</b>	-0.04	0.04	0.10	1.00						
<b>NOE</b>	0.06	-0.05	0.00	0.19	1.00					
<b>EB</b>	0.07	-0.13	0.11	0.06	-0.09	1.00				
<b>RB</b>	-0.03	0.09	-0.13	0.31	-0.25	0.14	1.00			
<b>AvrYS</b>	-0.03	0.05	-0.06	-0.06	0.20	-0.24	0.37	1.00		
<b>AvrAge</b>	-0.01	-0.06	0.05	0.22	-0.08	0.10	-0.01	0.55	1.00	
<b>HCTOT</b>	-0.04	0.01	0.00	0.16	0.50	-0.03	0.06	-0.02	0.03	1.00

**SP**: Share price at the end of the quarter that firms published their annual report. **BV**: Book value divided by the number of shares. **NI**: Net income divided by the number of shares. **AvrSal**: Average Salary of permanent employees. **NOE**: Number of employees (consolidated basis). **EB**: Employee benefit expense divided by the number of employees. **RB**: Retirement benefit expense divided by the number of employees. **AvrYS**: Average tenure of permanent employees. **AvrAge**: Average Age of permanent employees. **HCTOT**: Sum of frequencies of each keyword in Table 5-1.

**Table 5-7: Partial correlation matrix for graphical model with HCQC, HCMC, and HCPS**

	<b>SP</b>	<b>BV</b>	<b>NI</b>	<b>Avr Sal</b>	<b>NOE</b>	<b>EB</b>	<b>RB</b>	<b>Avr YS</b>	<b>Avr Age</b>	<b>HC QC</b>	<b>HC MC</b>	<b>HC PS</b>
<b>SP</b>	1.00											
<b>BV</b>	0.57	1.00										
<b>NI</b>	0.04	0.75	1.00									
<b>Avr Sal</b>	-0.04	0.03	0.11	1.00								
<b>NOE</b>	0.08	-0.05	-0.01	0.17	1.00							
<b>EB</b>	0.07	-0.13	0.10	0.06	-0.08	1.00						
<b>RB</b>	-0.03	0.09	-0.13	0.30	-0.26	0.14	1.00					
<b>Avr YS</b>	-0.04	0.05	-0.05	-0.06	0.22	-0.24	0.38	1.00				
<b>Avr Age</b>	-0.01	-0.06	0.04	0.21	-0.10	0.10	-0.01	0.55	1.00			
<b>HC QC</b>	-0.01	0.10	-0.12	0.10	0.13	-0.05	-0.01	0.06	-0.01	1.00		
<b>HC MC</b>	0.04	-0.12	0.12	-0.05	-0.03	0.09	-0.03	0.04	-0.02	0.51	1.00	
<b>HC PS</b>	-0.07	0.01	0.04	0.08	0.33	-0.06	0.11	-0.15	0.07	0.27	0.33	1.00

**SP**: Share price at the end of the quarter that firms published their annual report. **BV**: Book value divided by the number of shares. **NI**: Net income divided by the number of shares. **AvrSal**: Average Salary of permanent employees. **NOE**: Number of employees (consolidated basis). **EB**: Employee benefit expense divided by the number of employees. **RB**: Retirement benefit expense divided by the number of employees. **AvrYS**: Average tenure of permanent employees. **AvrAge**: Average Age of permanent employees. **HCQC**: Sum of frequencies of each keyword classified as Qualification/competence in Table 5-1. **HCMC**: Sum of frequencies of each keyword classified as Motivation/commitment in Table 5-1. **HCPS**: Sum of frequencies of each keyword classified as Personnel in Table 5-1.

## **Chapter 6: Concluding Remarks**

### **1. Comprehensive summary**

In Chapter 1, six research agendas were listed to consider various issues in the corporate disclosure of human capital (HC) from the decision-usefulness approach.

**【RA1】** How has the topic of accounting for HC changed in terms of external reporting, and what empirical evidence on HC disclosure do we have, in particular for the decision-usefulness approach?

**【RA2】** Why do most accounting regimes not allow managers to capitalize investments in HC, and what information about HC is missing from the financial statements?

**【RA3】** What is the impact on investors of non-financial HC disclosure?

**【RA4】** How do managers disclose HC information to reduce the information asymmetry between investors and managers?

**【RA5】** To whom do managers voluntarily disclose non-financial HC information in integrated or annual reports?

**【RA6】** How should managers disclose information of HC to investors in forms of financial and non-financial information within the framework of integrated reporting?

In Chapter 2, the history of accounting for HC was briefly explored in chronological

order and the result of the systematic review of empirical studies on HC information for investors' decision-usefulness (corresponding to RA1) were listed. The qualitative literature review introduced what is already known and the trend of this research topic. The issue of whether HC should be capitalized or treated as an expense in the financial statements has been a primary interest of accounting researchers since the early stages of accounting research (Brummet et al., 1968; Lev and Schwartz, 1971; Paton, 1922). Most experimental studies reported that capitalizing HC investment has an impact on investors' decisions.

In the 1990s, the concept of intellectual capital (IC) emerged following the growing interest in accounting for intangibles (Massingham and Tam, 2015). HC was classified as a part of IC in the most widely used classification (Stewart, 1997). IC research used this classification to empirically measure the value of IC through content analysis or other methods (Massingham and Tam, 2015). Such research often focused on non-financial information in annual reports or other standalone reports. However, the relationship between voluntary HC disclosure and corporate value (market value) has not been clarified because of the mixed results about the association (Wyatt and Frick, 2010).

Chapter 3 considered how HC should be treated in financial statements using the two normative mixed accounting models (corresponding to RA2). The main focus was an



analysis of whether HC can be capitalized considering the matching principle or the current accounting standards' recognition criteria and measurement attributes (historical cost and fair value). The following discussion explained why, under the current accounting system, managers are not allowed to capitalize HC in most cases. However, the possibility of capitalizing HC in the financial statements in special cases was pointed out (Morrow, 1996). Similar to R&D expenses, there is a thin line between recognizing an expense or an asset, which depends on the relevance and reliability perceived by financial statement users. Although recognizing HC as an asset is almost impossible due to measurement uncertainty, non-financial HC disclosure might compensate for the missing information about future cash inflow related to HC.

In Chapter 4, the impact of IC (including HC as a part of it) disclosure on investors (corresponding to RA3 and RA4) was investigated. The results did not show the impact on investors of all IC disclosure. The main finding was that initiation of IC disclosure can be effective for investors only if a firm discloses all three types (HC, structural capital (SC), and relational capital (RC)) of IC information simultaneously. Information on HC, the source of innovation in an organization, is important for decision making, so it is necessary to include its related index to describe the value-creation process. This result was consistent with the guidelines published in 2004 (METI, 2004).

In Chapter 5, a review of the literature on HC disclosure was presented and the value-relevance between HC disclosure, accounting numbers, and share price was extended using the graphical modelling method. The chapter focused on managers' disclosure behaviour rather than the impact of disclosure on investors (corresponding to RA5). Its main findings revealed that the level of HC disclosure relates to the average salary and number of employees. This evidence indicates that Japanese firms disclose HC information voluntarily for the benefit of their employees rather than for investors. If the primary purpose of integrated reporting is to explain to capital providers how an organization creates value (IIRC, 2013), firms should disclose value-relevant information first. An et al.'s (2011) theory could also be extended by prioritizing information users.

Finally, all previous chapters are summarized to consider RA6. The rest of this chapter discusses a guideline for financial and non-financial HC disclosure in the integrated reporting framework.

## **2. A guideline for HC disclosure**

### ***2-1. Reporting in financial statements***

The capitalization of HC has several limitations that need to be addressed. These include measurement difficulties and non-separable or saleable characteristics of HC (Skinner, 2008). Although the current accounting treatment of HC (recognizing its investment immediately as an expenditure) has some limitations because it does not

provide information on the related future cash flow, it is a feasible and reliable indicator if complemented with non-financial information (Skinner, 2008).

Moreover, managers should disclose the expenditure for HC separately from other items (possibly as notes to financial statements), because it is as important as R&D expenditure and can have a long-term effect. For instance, training expenses or investments in improving employees' working environment are particularly relevant (for example, Ballot et al., 2001; Caskey and Ozel, 2017; Hansson, 2004).

## ***2-2. Disclosure of non-financial HC information***

### ***2-2.1. Compulsory versus voluntary disclosure***

The Financial Instruments and Exchange Act in Japan have required all listed parent companies to disclose their number of employees, average tenure, average age, and average salary since 1953. It is important to note that all these disclosures are verified objectively by auditors.

The extent to which managers should be required to disclose HC information by fiat remains complicated. Dye (1990) showed that if real externality (a case where a disclosure by one firm alters the actual distributions of other firms' cash flows) exists, it is difficult to make a general statement about compulsory and voluntary disclosure.

For instance, if one firm (manager) discloses a large amount of investment in employees, stakeholders may react positively, but rival firms may increase their investment. In this case, the total social welfare brought about by disclosure depends on the net increase in value (benefits minus costs) for the related firms and stakeholders. When the sum is negative, mandatory disclosure is not desirable.

### ***2-2.2. Voluntary disclosure strategies***

Chapter 4 revealed evidence indicating that managers should disclose HC information with other intangibles so that investors understand the value creation story of the firm and reduce the cost of equity capital. The evidence supports the IIRC's (2013) integrated reporting framework and is consistent with Diamond and Verrecchia's (1991) theory. However, if there is a strategic opponent, a manager should consider not only the benefits of disclosure but also the proprietary cost (a cost imposed on the firm if its opponent takes an adverse action) and the threshold value (the ex-ante risk that an adverse action is taken by its opponent) to decide what proprietary information to disclose (Wagenhofer, 1990).

Traditional studies have modelled equilibrium for voluntary disclosure by assuming that information users are investors, and sometimes other competitors or regulators (Dye, 1990; Wagenhofer, 1990). An et al. (2011) extended the user group to stakeholders to

include employees, customers, or society in general. In fact, Chapter 5 provides supportive evidence for the stakeholder theory where a manager voluntarily discloses HC information not only to the financial market but also to the labour market. By disclosing certain types of HC information to prospective employees, firms may attract a talented worker pool and improve worker productivity, in turn improving firm performance. However, managers should prioritize the information for investors by disclosing HC information<sup>33</sup> as a story relating to other firms' capital in the firms' value creation process.

Dhaliwal et al. (2014) conducted an international comparison of the impact of CSR disclosure on the cost of equity capital. Their result reported that CSR disclosure reduced the cost of equity capital and this relationship is stronger in stakeholder-oriented countries. Therefore, the benefit of HC disclosure might vary by country and so would the equilibrium of voluntary disclosure. However, this also implies that if society becomes more stakeholder-oriented, firms should disclose more HC information and vice versa.

### **3. Contribution**

This thesis contributes by extending the accounting theory of HC in the following ways. First, the previous studies were systematically summarized, showing the

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<sup>33</sup> For example, Nomura Holdings Inc. explained the impact on its accounting numbers and future value creation of acquiring the ex-employees of Lehman Brothers as a story in the annual report released in 2009.

accumulated empirical evidence on value-relevant HC information (RA1). Second, the accounting models that had not been specified in most previous studies were clarified and how to represent HC in financial statements (RA2) was investigated. Third, focusing on its combination with other intellectual capital and points of disclosure, empirical evidence was provided on how to disclose non-financial HC information to reduce information asymmetry between managers and investors (RA3 and RA4). Finally, by emphasizing the labour market in Japan, the results showed that managers voluntarily disclose non-financial HC information and suggested an amendment to the existing theory (RA5).

A new statistical method (graphical modelling)<sup>34</sup> was introduced to the value-relevance study of accounting, which illustrated that there is the possibility of new discovery through clarification of the structure between variables overlooked in previous value-relevance studies. This new method contributes to the methodology in accounting research.

The study suggested practical guidelines that provide direction on how to disclose financial and non-financial HC information to practitioners and regulators. However, the

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<sup>34</sup> See Chapter 5 for a detailed explanation.

structure and causal relationships between various HC factors and the value creation process are still unclear. This issue can be addressed as a future research topic.

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