Can human capital be tracked? An analysis of human resource disclosures

Mengyuan Huan

Thesis submitted to the
Faculty of Graduate and Postdoctoral Studies
In partial fulfillment of the requirements
for the MSc degree in Management

Telfer School of Management
University of Ottawa

Abstract

This thesis presents a new methodology for measuring and reporting the value of human capital (HC). Building on prior research in strategic HC management and related fields, a disclosure-based HC index, which contains both HC proxies and disclosures scores, is built based on information collected from the annual reports and other stakeholder reports of "the best companies to work for" survey ("Universum" 2010).

This thesis examines the importance of the degree of HC disclosure and its correlation with company "Universum" ranks and tests whether higher employee benefits and welfare are positively related to HC information disclosed in the issued reports. Furthermore, it investigates whether higher levels of financial and non-financial HC information disclosure are associated with better firm performance and tests whether the positive relationship between human capital proxies and firm performance (concluded by resource-based theory and strategic HRM) is still valid during the crisis years (2008-2010). Regression results indicate that human capital information disclosed in previous years has a weak effect on company's Universum rank and no influence on firm performance. Moreover, the commonly used employee incentive-based management methods may no longer be effective during the economic crisis years. Investing in training during the financial crisis period is critical for better firm performance. More research is needed in the future to examine the role of human capital in firm performance and how it should be measured, managed and governed in modern corporations.

Acknowledgement

I would like to express my deep gratitude to my supervisor: Professor Kaouthar Lajili of the Telfer of management at University of Ottawa for her fruitful guidance, valuable comments and real encouragement. Prof. Lajili spent a lot of time supervising my thesis work and her office was always open whenever I ran into a trouble spot or had a question about my research or writing. She always allowed this paper to be my own work, but guided me to the right path whenever she thought I needed it. Her timely advice has helped me largely finish this thesis. I also like to thank Professors Tyler Chamberlin and Samia Chreim, for their most valuable advice, and especially for their insightful comments and suggestions during my thesis defence. Finally, I would like to thank Annie Baylor from the graduate office for her kindness and patience in helping me follow the right procedures to hand in my final thesis.

Contents

List of figures and tables

Figure:

Table:

1. Introduction

Human capital has been considered an extremely important organizational asset for surviving and thriving in all companies. Organizations that appreciate the financial impact of their employees often refer to them as human capital. Becker (1964), who is a Nobel Prize-winning economist, used the term "human capital" to refer to people who are the basic resource in any company. Human capital is broadly defined as the "skills, knowledge and capabilities of the workforce" (Burton-Jones & Spender, 2011). Thus, it can be defined as the collective set of attitudes, skills, and abilities of people contributing to organizational performance and productivity.

The importance of human capital has been considered by many leading organizations in the world. For example, Google's development approach is to invest in people. According to Google's annual report, as the most attractive employer in the ranking of the 50 most attractive employers in "Universum" global survey[1], Google treats employees with respect, dignity and sincerity, giving them freedom, autonomy, and purposes in their jobs. It has small groups in order to come up with new products and ideas for solving business problems. It contains informational justice in its organization. It emphasizes the perceived fairness of communication provided to employees, giving honest and candid information about the firm's operations and conditions and shares detailed information with all employees. Moreover, it also emphasizes the recruitment process by hiring people who are best fit with this organization. They consider that candidates who are hired are highly motivated by learning, knowledge, and skills [2].

Many scholars recognize that firm performance is strongly related to human capital. The notion that firm competitiveness and profitability are positively associated with human capital is pervasive in the literature (Shaw et al., 2013; Crook et al, 2011; Huselid, 1995). Therefore, the importance of human capital has long been considered in the business literature.

1. http://universumglobal.com/rankings/

2. http://insights.som.yale.edu/insights/whats-google-approach-human-capital

Investments in human capital are similar to resource expenditures on other types of resources, facilities, and equipment (Burton-Jones & Spender, 2011). Corporations are recognizing the importance of investing in their human assets now more than before. Companies are beginning to understand that to succeed in the global economy, they need to place more and more emphasis on developing and retaining their people. Any expenditure in on-the job training, medical care, and support has been regarded as an investment not an expense (Becker, 1962).

Measuring human capital has been recognized as a challenging task in all corporations. Many scholars define human capital as an intangible asset (e.g., Burton-Jones & Spender, 2011). The intangible asset can be calculated from subtracting the cost of the firm's tangible capital from the total value of firm's capital (Burton-Jones& Spender, 2011). Three common approaches to measure human capital include: (1) a cost-based approach, (2) an income-based approach, and (3) an education-based approach (Le et al., 2003). One common approach to measure the value of human capital is based on the time for training and education. However, the value of two years' college study may not be by equivalent to the value of two years' university study. According to Burton-Jones and Spender (2011), an alternative way to measuring the value of human capital with a firm is to compute the "productivity and profit benefits of investments in training and in relationship-building". However, they note that estimating the effects of the investments on training and education can only be done using a large sample of firms rather than using a single business firm. Many scholars considered that the metrics they developed could be recognized as "best practice".

Baron (2011) demonstrated that "human capital can only have added value if it can be successfully converted into goods and services that will make a profit" (p30). Areas of measurement include acquisition, development/ talent management, reward, retention, exiting, motivation, and performance.

The lack of direct measures of human capital value is apparent in two key evaluation contexts: (a) internal evaluation of managers and (b) evaluation of organizations by external stakeholders (Fulmer & Ployhart, 2013). This paper will concentrate on an alternative way to measure the value of human assets within an organization that builds upon Le, Gibson and Oxley's cost and income-based measurement considering financial factors as well as taking non-financial factors into account. Recently, scholars only considered the impact of financial factors that include expenditures on health and safety cares, mobility, pensions, reserved funds and training on employees to measuring the value of human capital within a corporation (Le et al., 2003). They admit that non-financial factors may have great impacts on the computation of the human capital index. These include work conditions and corporate social politics, work dignity and protection against discrimination, task identity, task variety, task significance and autonomy assigned by employers (Le et al., 2003). This paper will attempt to explore how to measure and track human capital considering both financial and non-financial factors by conducting a content analysis of HR information of the "world's top 50 attractive employers" based on Universum list (See appendix Table 21). The ranking of the world's top 50 attractive employers emerged from a survey provided by Universum where 24000 students chose the company they would like to work for. Thousands of employers are nominated, but only 65 companies can be placed within the most attractive employers[1]. For business students, these top ranking businesses are highly associated with providing professional training and development for employees. For engineering students, consumer electronics, software and computer service, and technology and hardware equipment associated with innovation, fast growing, and entrepreneurial qualities are key influencing factors in deciding which company they want to work for.

The goal of this paper is to investigate the association between human resource disclosure scores, Universum rank order, human capital variables, and firm performance Firstly, we test the ranking validity by analyzing the correlations between total score, total sentences and total

1. http://universumglobal.com/rankings/

percentage of disclosure. Secondly, the hypothesis that the degree of human capital disclosure (financial and non-financial) in the annual and CSR reports has a positive correlation with the universum ranking was analyzed. Results show that this relationship is weak, which indicate that the issued reports are not the only source of information to choose a company. Thirdly, the regression method was utilized to analyze whether human capital proxies are related to the disclosure scores and results indicate some effects on the contents in the issued reports. Fourthly, the issue regarding the hypothesis that a higher degree of disclosure of financial and non-financial human resource information is related to better firm performance was tested. Results show that there are no correlations between the disclosure scores and firm performance.

The last hypotheses examined are: 1) whether higher human capital proxies have a positive correlation with firm performance during the economic crisis years; 2) whether companies reward employees when better firm performance is achieved during economic crisis years. The results for the first hypothesis indicate that 'employee training costs' and 'training spending per employee' are positively and significantly related to 'price to book ratio' during the crisis years. Whereas, some of the human capital variables, such as 'Number of employees' and 'Total salaries and bonuses paid to executives (short term)' are not positively but negatively correlated to 'EBITDA Margin'. The results for the second hypothesis also show that during the financial crisis years, the employee incentive-compensation methods may no longer be effective in the short run, the best choice for a firm in these years being to save employee costs in order to overcome the crisis.

This paper contributes to the literature on strategic human resource management (SHRM), disclosure, and firm performance. Standard setters can use this paper's results in selecting categories for human capital disclosure. In addition, this study can help HRM managers to design appropriate compensation packages that increase employees and employers' motivation to enhance firm's competitive advantage and profitability during economic downturns.

2. Literature Review

2.1 Definition of Human capital

Human capital has been defined by many human resource management (HRM) researchers. It was originally considered the basis for estimating employees' salary contribution (Unger et al., 2011; Becker, 1964； Smith, 1937). Arthur Pigou was the first economist using the term "human capital" in 1928. The concept of human capital had been widely used after Becker (1964) considered the importance of the influence of education and training on variations in wages and salaries across different workers and sectors. Human capital has been broadly defined as "the knowledge, skill, competencies and attributes embodied in individuals that facilitate the creation of personal, social, and economic well-being" (Le et al., 2003). Thus, it is clearly shown that human capital is classified as an intangible asset in all corporations and greatly interacts with both organizational and social capital (Lajili 2015).

As discussed before, the common approaches to measuring the value of human capital that has been demonstrated in the literature includes cost-based approach, income-based approach, and the commonly applied "educational stock-based approach" （Le et al., 2003). The cost-based approach has been demonstrated by Engel (1883), Kendrick (1976), Wickens (1924) and Eisner (1985). It estimated that human capital is based on child rearing costs to their parents. Scholars agreed with Eisner's point of view that human capital is intangible instead of Kendrick's view that human capital can be divided into tangible and intangible. However, there are several limitations with the cost-based method. There is no direct relationship between investment for human capital and the quality of output (Le, Gibson & Oxley, 2003).

2.2. Theories in Strategic Human Capital

Human capital has been examined within three fundamental theories of the firm (1) transaction costs theory, (2) agency theory, and (3) resource-based view. These theories consider the issues of investments in firm-specific human capital, conflicts of interests between

stakeholders of the firm, and the firm's competitive advantage potential of human capital. In general, these theories outline the complexity pertaining to human capital management.

2.2.1. Transaction Cost Theory and Human Capital

Transaction cost theory (TCT) was developed by many scholars including Coase (1937), Simon (1951), Williamson (1975) and Alchian and Demsetz (1972), and (Burton-Jones & Spender, 2011). It addresses the costs involved in making an economic exchange such as an employment contract. The foundation of transaction cost theory was initially built by Ronald Coase (1937,), and the theoretical framework of TCT was continually developed by Simon (1951), Alchian and Demsetz (1972), and significantly expanded by Williamson (1975). Williamson (1975) considered that an organization could be recognized as an "authority" that governs the contractual relations in it. He (1985) divided transaction cost into two parts-advanced (or ex-ante) costs and afterwards (or ex-post) costs. For instance, the expenditure associated with the behavior of concluding an employment contract is an example of advanced costs. Afterwards costs can occur when an employee wants to exit a contractual relationship; she/he must pay for the cost. Through combing Becker's work on human capital, labour law, and the internal labour market, Williamson pointed out that there are four different methods for contracting labour services which include sequential spot contracts, contingent claims contracts, long-term contracting, and establishing an authority relation alone (Burton-Jones & Spender, 2011). In general, contracts are used to create job-specific skills and related task-specific knowledge.

Williamson (1985) summed up two reasons why transaction costs exist. One influential factor related to human beings, another one is associated with a particular transaction. Opportunism is one of the human factors influencing the transaction cost. It refers to individuals who may violate the contract in order to pursue their own interests. Therefore, transaction costs emerge because one party has to consider how to prevent the opportunistic behaviour of the other party (Burton-Jones & Spender, 2011). Bounded Rationality refers to an individual who could not consider all the contingencies in the process of trading, and it will increase the cost of concluding an employment contract and the cost of solving unexpected

events (Simon, 1978). For instance, a manager may lay off employees incorrectly because not only he/she has to choose employees leaving, but also he/she wanted to complete this task within a specific time limit. Thus, the manager may choose to skip parts of the evaluation process in determining whether he/she should lay off some employees rather than using a rational process. The cost of this action can be considered as a loss of human capital.

Williamson (1985) considered that all economic activities are regarded as trades and transaction costs can emerge due to the following three reasons that include :(1) asset specificity, (2) uncertainty, and (3) frequency. Asset specificity can be viewed as the most important feature of the transaction cost theory (Burton-Jones & Spender, 2011). Asset specificity refers to the fact that after the resources were used for a specific purpose, it is hard to use them for any other purpose (loss of value in the next best use alternative). For example, labour trained to perform a specific and single task. However, an investment in firm-specific human assets can be considered sunk costs since these assets have some inherent restrictions on other possible uses. When the corporation changes the operating machines, employees who even had prior specific and single tasks training may not know how to manipulate new machines which leads to new training expenditures thus adding to the costs of production. In addition, no variety in tasks may make employees feel bored and increase job dissatisfaction since employees may not feel interested in work itself. Otherwise, outsourcing, which could be a very costly method of hiring employees outside the firm, may be considered an efficient way dealing with change issues. In addition, because of turnover and opportunism, there is a potential hazard to the organization if employees apply critical knowledge and skills that they learned from the present corporation to any other corporations. However, Lajili (2012) emphasized that if a firm makes less investment in developing firm-specific talents, it will have higher uncertainty pertaining to future organizational growth and demand, and the firm is more likely to choose strategic alliance, labour outsourcing, and accommodate inter-firm linkages to reach a low cost of transaction process. “Relational and implicit contracting, relationship building, and trust” are useful ways to retain employees by favoring their organizations thus mitigating transaction costs and the problems caused by turnover (Lajili, 2012).

Nevertheless, transaction costs theory has two limitations: (1) “human asset specificity may be difficult to measure, (2) opportunism and hold-up focus may not be realistic and valid always” (Lajili, 2015, p 748). Thus, the influence of transaction costs may be overestimated or underestimated by researchers based on the above two reasons.

2.2.2. Agency Theory and Human Capital

Jensen and Meckling originally proposed agency theory in 1976. It examined the potential conflicts of interests between principals and managers. This may happen when managers have an incentive to improve on- the-job consumptions (self-interest) rather than having the same aims and goals as owners (shareholders) who are engaged in increasing the profitability and performance of the firm. Thus, agency costs result from” the misalignment of managers’ and owners’ interests”. (He & Wang, 2009; Lajili, 2012). In general, agency theory shows that we should understand that HC as not being only related to knowledge and skills, but also related to different interests between shareholders and managers, employers and employees and thinking about the most effective and efficient ways to deal and mitigate such agency costs.

Moreover, Lajili (2012) stated that agency theory also focused on optimal employment contract design. Both “Information asymmetries” and “the separation of ownership and control’’ can lead to agency costs. Information asymmetry can be considered as a major cause of agency problems. When a principle has little information to evaluate managers’ motivation and ability, opportunism phenomenon will be more likely to appear in the firm (Lajili, 2012). He & Wang (2009) stated that the research on corporate governance focused on helping to reduce the agency costs. There are various effective ways to minimize agency costs including incentive-compatible contracts, performance-based compensation, equity asset ownership, internal controls and monitoring devices (Lajili, 2012). However, He & Wang (2009) demonstrated that although incentive-based governance can be viewed as one of the efficient and effective ways dealing with agency costs by accurately linking the managers’ personal gain with a firm’s performance, it may have some drawbacks if managers attempt to gain short-term performance while damaging long-term shareholder benefits.

In general, agency theory focuses on employee contract design, team production input and output measurement, and solving ex-ante and ex-post agency costs. In agency theory, "risk sharing and uncertainty would be modeled explicitly" and the "positive branch is useful in predicting optimal governance design" (Lajili, 2015, p748). However, the limitations of agency theory contain two aspects: (1) hard to measure individual performance when there is a team production and (2) "restrictive assumptions for the incentive contracting mathematical approach" (Lajili, 2015, p 748).

2.2.3. The Resource-based View and Human Capital

The resource-based view emphasizes the importance of resources including intangible assets, such as knowledge, intellectual and human capital in creating firm competitive advantages (Barney 1991). Intangible assets can be viewed as the most important assets for a firm (creating competitive advantages based on value, rareness, non-substitutability and inimitability (Barney 1991, Burton-Jones & Spender, 2011).

Previous research history considered that human capital is associated with sustained competitive advantage to the organization because tacit knowledge and social complexity are hard to imitate (Shaw et al., 2013). However, some human capital attributes will cause dilemmas that may prevent organizations from capturing this advantage. Coff (1997) outlined three human asset attributes that may cause management dilemmas: (1) Asset specificity, (2) social complexity and (3) causal ambiguity. As discussed before, asset specificity refers to special skills and knowledge that can only be applied to finish a specific task, so it seems that the inimitability feature can be defined as an advantage of the firm-specific human capital. However, unlike tangible assets, human assets are harder to manage since firms cannot own their employees who are free to decide whether to stay or quit. Nowadays, high voluntary turnover, the path dependencies, and social complexities associated with the long-tenured workforce are depleted causing huge human capital loss, so that rivals can more easily imitate the resource and diminish any competitive advantage emerging from firm-specific human assets because firms may lose such critical human assets. Even though idiosyncratic skills reduce the risk of turnover since these skills are not in demand, specificity leads to social

complexity and causal ambiguity. Social complexity refers to a broad network with stakeholders such as customers or suppliers (the external aspect) and team production (the internal aspect). Boundary-spanning networks refer to a group of individuals playing a role of linking the organization's internal networks with external networks (Coff ,1997).

In addition, the dilemmas with team production pose governance problems for firms since team production causes the problem of the unobservable individual contribution (Coff, 1997). Causal ambiguity is defined as uncertainty about which factors contribute to success and associated with both competitors and the favored firms. Therefore, both social complexity and causal ambiguity are associated with information dilemmas. Because of the hazards caused by both social complexity and causal ambiguity, firms should cope with the problem of "adverse selection, moral hazard, and bounded rationality in decision making" (Coff, 1997, p364).

According to Coff's points of view, there are four coping strategies that include (1) retention, (2) rent sharing, (3) organizational design, and (4) information. Retention strategy refers to promoting retention without allocating the rent. Pay employees enough is a simple way that make employees not quit (Weiss, 1990). However, according to five dimensions of satisfaction that include pay, supervision, coworkers, promotion, and the work itself, pay is the least important facet of satisfaction (Jung, Dalessio, & Johnson, 1986; Rice, Gentile, & McFarlin, 1991; Scarpello & Campbell, 1983). Therefore, many scholars pointed out that non-financial aspects can offer even more chances for reducing turnover rates. Those include improving satisfaction with supervision by providing training, creating team-based work environment, structuring career paths, and building a favourable working environment. Besides, firms can also offer firm-specific compensation that other organizations cannot imitate and encourage firm-specific investments that introduce firm-specific knowledge that binds people to have more connection with the firm (He & Wang, 2009).

Rent sharing strategies include stock ownership, profit sharing, group incentive or performance based compensation from sharing rent through individual, group and organization level (Coff, 1997). It can be viewed as a solution to agency problems (Jensen & Meckling, 1976). Organizational design strategies involve shared governance, organic structure, and

culture aligning individual goals with those of the organization (Coff, 1997). Information strategies refer to using information sources to cope with moral hazard (Coff, 1997). Through utilizing supervisory monitoring, peer/subordinate appraisal, and external information sources for evaluating employees, using information sources to cope with adverse selection through limiting exposures to the labor market by training existing employees during economic downturn and developing sophisticated ways of gathering and interpreting information, and identifying talent without labour market signals by owners, firms can overcome some moral hazards. (Coff, 1997).

Nevertheless, resource-based theory omits some forms of human capital that include knowledge and skills people gained from their personal private lives. In general, this theory (1) "neglects the complexities associated with the ownership of human capital" (2) "does not clearly consider the knowledge and skills that people may gain outside the firm", and (3) "does not cover the collective level of human capital" (Burton-Jones & Spender, 2011， p225).

2.3 Firm Performance and Human Capital

Garavan et al (2001) demonstrated that human capital has four key attributes that include: (1) flexibility and adaptability, (2) enhancement of individual competencies, (3) the development of organizational competencies, and (4) individual employability. These attributes demonstrated that researchers attempted to associate human capital with higher performance and sustainable competitive advantages, and higher organizational commitment (Nordhaug, 1998; Iles et al, 1990; Robertson et al, 1991).

A number of studies found that human capital is strongly related to organizational performance especially when the human asset is not easily tradable in the labour market (Crook et al, 2011; Youndt et al, 1996). Crook et al (2011) suggested that managers should invest in programs that increase and retain firm-specific human capital. However, investments in firm-specific human capital can increase the phenomenon of opportunism according to the transaction cost theory. Youndt et al (1996) stated that enhancing human capital is directly related to operational performance, such as employee productivity, machine efficiency, and

customer alignment. They emphasized that operational performance increase should link with enhancing HR systems through a quality manufacturing strategy.

The controversial questions associated with how to get the best outcomes from employees and what kinds of investments really affect workforce performance have been raised by many scholars (Davenport et al. 2010). For example, Liu et al (2014) found that firms with greater share turnover, higher shareholder concentration, and higher levels of financial leverage are less likely to invest in human resource systems that create strategic human capital. Companies are increasingly using complicated methods to increase their competitive advantage through analyzing human capital data. Davenport et al. (2010) propose six kinds of analytics (discussed below) that can help organizations answer critical talent questions.

Human capital facts can be recognized as the simplest one of six kinds of analytics. It refers to monitoring employee engagement and predicting financial performance in order to ensure the organization's overall health. The second kind of analytics is analytical HR. It is defined as a way to analyze which units, departments or individuals need attention through collecting timely performance-review data to identify areas requiring improvements. The third level is human capital investment analysis. It can help an organization recognize which actions can have the greatest impact on business performance. By analyzing the satisfaction levels of employees, firms can save costs in hiring and training and improve their retention rate. The forth level is workforce forecasts by analyzing turnover, succession planning, and business opportunity data to identify some weaknesses of key capabilities before the hazard happens. For example, Dow Chemical uses a custom modelling tool to predict future head count for each business unit improving industry trends, political or legal developments. The fifth level is to prepare and evaluate a talent value model where a company uses analytics to evaluate which employees can be viewed as the most valuable assets and then create a model to increase retention rates because the company's hypothesis is that some individuals might be misplaced or poorly managed. The top and most sophisticated way applying talent analytics is to analyze the talent supply chain. It is intended to help companies decide the real time demand of talents (Davenport et al., 2010).

Strategic HRM researchers considered that high HRM investments could attenuate the negative effects on organizational performance caused by human capital losses increase (voluntary turnover rates). When HRM investments are high, human capital losses are substantially and significantly correlated with organizational performance (Shaw et al, 2013). High investment in human capital can create more valuable, non-substitute, and inimitable employees in the organization. When the turnover rate of theses higher value employees increases, it will cause more serious negative effects on firm performance. In addition, Shaw et al (2013) pointed out that a heavy investment in HRM is positively associated with the indirect and total effects of human capital losses on financial performance through workforce productivity. In general, investment in HRM can be considered as an effective way of dealing with the negative effects caused by human capital losses.

Recent literature shows the importance of training in the field of strategic human capital management. Tokarczyk et al (2007) stated that low competitive advantage is associated with the lack of training in the workforce and training can bring firms longevity and greater long-term business success. According to Universum's survey, which conducts the global ranking of the world's top 50 most attractive employers, training provided by employers could be viewed as an important factor that can attract candidates.

In addition, Collins & Clark (2003) showed that efficient HR practice leads to higher firm performance and TMT social networks, which are considered as important mediating links between HR practices and organizational performance, significantly affecting whether human capital can be considered a key factor for firms to create a competitive advantage. In addition, He & Wang (2009) stated that even though employees who have firm-specific knowledge and skills can be recognized as competitive advantages to the firm, the influence of top managers plays a decisive role for the emergence of this advantage. Many scholars questioned whether decision makers who have financial or nonfinancial information about human capital will really make a difference. The results are mixed based on extant research directly examining this question (Fulmer & Ployhart, (2013). Collins & Clark, (2003) considered that future research should focus on exposing other mediating factors, which can influence the relationship between HR practice and firm performance.

3. Research Hypotheses

Fulmer (2003) demonstrated that companies on the 100 best lists have positive employee relations, stable and positive workforce attitudes and performance advantages over the broad market. Thus, we considered that the human capital index is related to the ranking of the 50 most attractive employers (see Table 21 in appendix). Based on the above analysis, research hypothesizes are developed as follows:

H1: If the company has a higher human capital index based on the disclosure of financial and non-financial human resource information, it is more likely to have a higher ranking in the list of the world's top 50 employers.

H2: Human capital disclosure scores are positively associated with human capital variables

As previously discussed, there is reasonably strong evidence to show that firm performance is positively related to human capital (Crook et al, 2011; Youndt et al, 1996). The high level of investment in human capital promotes innovativeness and greater firm performance (Marimuthu, 2009). Thus, based on prior literature, we propose the following hypothesis:

H3a: If the company has a higher human capital index based on the disclosure of financial and non-financial human resource information, it is more likely to have a better firm performance.

H3b: If the company has better firm performance, it is more likely to have a higher degree of human capital disclosure.

Many scholars considered that monetary reward could improve employees' attitude and working place atmosphere in order to have better firm performance. (Mullich, 2004; Guo et al. 2006; Indjejikian, et al., 2002). Moreover, other scholars believed that bonuses given to employees should be positively associated with company profitability (Xia et al., 2015;

Gerena-Morales, 2004; Miller, 1995). Thus, based on the previous empirical studies, we propose the following hypothesis:

H4a: If the company invests more on human capital, it is more likely to have a better firm performance.

H4b: If the company has a better firm performance, it will lead to higher rewards for employees.

4. Methodology

Measuring human capital has been considered a challenging undertaking. Human capital has been viewed as a valuable resource in an organization. Baron (2011) states "human capital only added value if it can be successfully converted into goods and services that will make profits" (p. 30). Areas of measurement can include: (1) acquisition, (2) development/talent development, (3) reward, (4) retention, (5) exiting, (6) motivation, and (7) performance (Baron, 2011).

Nevertheless, few scholars consider that in assessing a human capital index, non-financial factors should be regarded as important components that need to be considered in order to validly and accurately measure human capital in organizations.

In this study, we follow prior literature and index (or score) development methodologies to build a human capital index. More specifically, we first review each relevant methodology and then propose our approach. The relevant methodologies are the following: the CSR disclosure index (Remišová& Búciová, 2012; Abbott & Monsen, 1979), corporate governance index (Gompers, Ishii, & Metrick, 2001), Environmental disclosure score (Wiseman, 1982), and z score (Altman, 1983).

There are three types of published research that attempted to measure corporate social responsibility (CSR): (1) social accounting, (2) reputational scale, and (3) content analysis (Abbott & Monsen, 1979). This paper will mainly use content analysis that includes annual (and other) reports of the top 50 most attractive employers, and other prior research reviewed

above, to help build a human capital index. The research costs will be reasonably low in comparison to other types of analyses.

According to Gompers, Ishii, & Metrick (2001), the methodology for computing the governance index is coding items into categories. According to this empirical research paper, the governance index (G) is the sum of points with each point allocated for the existence of each provision/category. They code items into five categories: Delay, protection, voting, other, and state. For the state laws with a firm-level analogue, they add one point to the index if the firm is covered under the firm-level provision. The governance index has a possible range from 1-24 and is the sum of the five categories. In order to compute a human capital index, we follow this methodology of coding items into categories and add one point for each related item.

Remišová& Búciová (2012) stated that CSR is achievable for all large organizations regardless of the volume of their financial resources. CSR does not monitor the amount of money invested by employers in the organization, but the way to create an appropriate work environment for its employees to grow (Remišová& Búciová, 2012). The non-financial elements that could be considered for inclusion into the human capital index are: (1) work conditions and corporate social politics, (3) collective bargaining, (4) work dignity and protection, and (5) against discrimination (6) environment, (7) equal opportunities, (8) personnel (Abbott & Monsen, 2011, Remišová& Búciová, 2012). According to the "Employment Equity Act", employers should ensure improved job opportunities for four groups: (1) women, (2) aboriginal people, (3) members of visible minorities, and (4) people with disabilities. Moreover, equal job opportunities should also consider the career development of employees such as the advancement of minorities and racial minority (Remišová& Búciová, 2012). Personnel is associated with the following five requisite aspects: (1) employees' health and safety, (2) training, (3) other disclosure (bonuses provided for managers), (4) personnel counselling, and (5) assistance to displaced employees to locate new networks (Remišová& Búciová, 2012). We add one point for each item to the index if the organization discloses any information about the above items.

As discussed before, the methodology for collecting the data will include coding items into categories in the paper. However, according to Abbott and Monsen's statement (1979), errors of two types are possible: (1) the formulation of categories that do not reflect all the issues actually contained in the report that are of policy interest and (2) inaccuracy in coding the raw data in terms of the selected categories. Following prior content analysis research (Lajili and Zéghal 2005, Wiseman, 1982) a comprehensive HR data collection from annual and CSR reports will be undertaken for the study's sample as explained below.

The indexing procedure will be similar to the one used by Wiseman (1982)'s measurement of environmental disclosures. Wiseman (1982) provides a detailed measure of environmental disclosure. The purpose of this procedure was first to objectively measure the information contained in the disclosures and second to provide a systematic numerical basis for comparing companies' disclosures with external environmental performance evaluations. Information items included in the index were selected through a review of the environmental reporting literature. These sources provided proposed formats for environmental reports including items of information considered essential for complete environmental disclosure leading to18 items of disclosure selected for inclusion in the index. Certain items were excluded if they were not reported in any of the environmental disclosures. Category one represented items directly related to economic factors. Category two represented items relating to environmental litigation. Category three included pollution abatement items. Category four represented other environmentally related items which did not fall into any of the previous categories (Wiseman, 1982).

Rating of the disclosures was based on the presence or absence and the degree of specificity of each of the information items. In order to compute a human capital index based on the methodology used by Wiseman (1982) and Chelli, Durocher, and Richard (2014), we consider that a score of two could be assigned to an item describing for example compensation in great detail (e.g., salaries and rewards to employees in monetary or quantitative terms). A score of one could be assigned to an item if it was presented in the disclosures with qualitative human capital information. Finally, a zero will be assigned if the human capital term was not present in the disclosure.

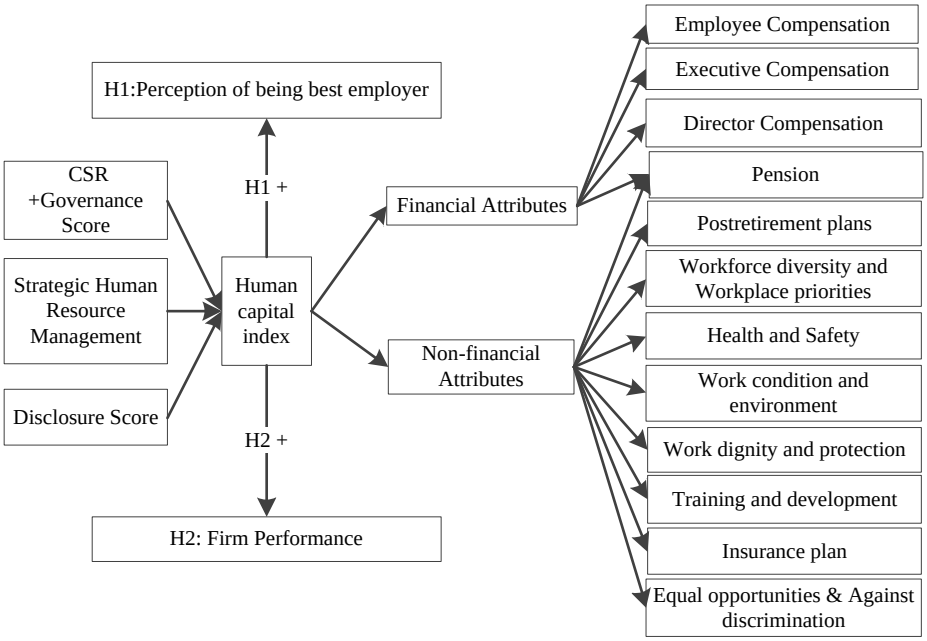

Figure 1. Study's conceptual framework

Another relevant scoring methodology is the z-score model developed by Altman (1983) using financial statement ratios and multiple discriminant analysis to predict bankruptcy for publicly traded manufacturing firms. A score of Z <1.23 indicates a bankruptcy prediction, 1.23<=z<=2.9 indicates a grey area and z>2.90 indicates no bankruptcy. We would like to use z-score method with regression analysis to validate the human capital index and check the statistical significance of its main components. The graph above shows our study's conceptual framework.

As Figure1 shows, we mainly consider that financial attributes include employee compensation, executive compensation, director compensation and pension. Non-financial attributes contain pension, postretirement plans, workforce diversity and workplace priorities, health and safety, work conditions and environment, work dignity and protection, training and development, insurance plan, and equal opportunities & against discrimination. Pension has both financial and non-financial aspects. Information collected from annual reports was recognized as its financial aspect. Information collected from CSR reports was considered as its non-financial aspect. In order to validate hypothesis 2(i.e., a positive relationship between

disclosure scores and firm performance), we would like to use both OLS and Logistic regression methods analyzing the relationship between price to book ratio, and EBITDA margin as the dependent variables and disclosure scores as the independent variables (i.e., total scores, total sentences, and total % disclosure).

In order to have robust results, we control firm size (proxy ln (total assets), country (US or non-US), industry type (service or non-service) and year (2008, 2009, or 2010).

4.1. Data collection

Firm performance variables and human capital variables were collected from the secondary data (e.g., Bloomberg and Compustat databases). Human capital disclosure scores data was collected by conducting a content analysis of annual reports and CSR reports. Total score (qualitative score +quantitative score), total number of sentences, and total disclosure percentage (frequency of occurrence of each subcategory) are calculated showing the degree of disclosure of both financial and non-financial human capital information in the reports. In order to obtain these total HC scores, firstly, a coding table was created for calculating each subcategory's score. The coding table (see table1) can be split into two parts, financial part and non-financial part. In the financial part, 12 subcategories are used for measuring the degree of financial information disclosure in the annual report. In the non-financial part, nine subcategories are used for measuring the degree of non-financial information disclosure in the annual reports and CSR reports (sustainability reports). Thus, the total number of subcategories to measure the degree of disclosure of human capital information in the study is 21. The coding table is shown below.

Table 1. The coding grid for human resource disclosure index

Human Resource Disclosure Index		
Main Category		Subcategory
	Employees	Salary
		Stock Based Compensation
		Incentives and Other Employee Compensation
		Pension
		Salary

compensation	Executive	Stock Based Compensation
		Option Based Compensation
		Non-equity Incentive plan
		Pension
	Directors	Board Retainers
		Other Compensation
		Pension
Corporate social responsibility report(CSR)		Pension
		Postretirement plans
		Workforce diversity and Workplace priorities
		Health and Safety
		Work conditions and environment
		Work dignity and protection
		Training and development
		Insurance plan
		Equal opportunities & Against discrimination

Human resource disclosure information related to subcategories in the financial aspect was collected from annual reports and other HC disclosure information pertaining to subcategories in the non-financial aspect were collected from CSR reports. For example, pension information was described in both annual reports and CSR report, so pension is included in both financial and non-financial parts. Based on previous content analysis research (Wiseman, 1982; Lajili & Zeghal, 2005; Guthrie, 2006), recognizing quantitative information sentences is based on the following two principles: (1) take the last sentences as a quantitative sentence if it is situated ahead of a numerical table; (2) a sentence is described in a quantitative manner. Calculating qualitative information sentence is based on whether this sentence is described in a qualitative manner. If there are two kinds of subcategories described in one sentence, we code them into both items.

The coding method for analyzing the categories in the above table is based on prior disclosure research and the scoring scale used in this paper is as follows:

0= if there is no information.

1= if the information is described in a qualitative manner.

2= if the information is described in a quantitative manner.

The following is an example of scoring: In its 2008 annual report, Apple corporation provided details for the item "board retainer" in the following way:

"Non-Employee Directors also receive a $50,000 annual retainer paid in quarterly installments, and the Chair of the Audit Committee receives an additional annual retainer of $25,000" (Apple's, 2008 annual report, page 17).

A score of "2" is given because information is provided in a quantitative way.

4.1.1 Data description

Table 2. The Descriptive Statistics for HC Disclosure Scores

	2008				2009				2010				2008 VS 2009		2009 VS 2010		2008 VS 2010	
	N	Mean	Std.	Median	N	Mean	Std.	Median	N	Mean	Std.	Median	t	Sig.	t	Sig.	t	Sig.
PD	44	33.12	17.40	28.57	44	29.65	17.12	28.57	44	30.52	17.97	23.81	0.94	0.35	-0.23	0.82	0.69	0.49
TSt	44	46.95	42.04	35.00	44	40.82	42.43	27.50	44	44.11	43.86	29.00	0.68	0.50	-0.36	0.72	0.31	0.76
TS	44	15.82	9.20	14.00	44	13.80	9.11	13.50	44	13.84	8.88	12.00	1.04	0.30	-0.02	0.98	1.03	0.31

Notes:
PD is the total percentage of disclosure defined as the total numbers of subcategories that are disclosed in the reports divided by the total numbers of subcategories. This variable includes total financial percentage of disclosure as well as total non-financial percentage of disclosure.
TSt is the total number of sentences counted by reviewing annual reports, CSR reports and other relevant reports including qualitative information sentences (Financial &Nonfinancial) & total quantitative information sentences (Financial &Non-financial).
TS is the total score defined as the sum of all the subcategories' qualitative scores (Financial &Nonfinancial) and quantitative scores (Financial &Nonfinancial). Qualitative score: if this category is described in a qualitative manner the subcategory gets 1 score. Quantitative score: if a subcategory is described in a quantitative manner, it gets a score of 2.

The descriptive statistics of variables measuring the overall disclosure status of human capital are shown in Table 2, for the year of 2008, 2009 and 2010, respectively.

As shown in Table 2, only 44 companies, which consecutively ranked (2008-2010) within the top 50 Universum rank, are selected in this analysis. The mean, median and standard deviations for overall HC scores have no significant changes (Independent Sample T-test, significance level of 0.05, two tailed) from 2008 to 2010. Similar results obtained when running non-parametric tests (see Table 22 in appendix). This is an interesting finding, since we can conclude that the general information disclosed by these 44 companies is similar in each year. One reason to explain this phenomenon is that these companies may have regulations (rules) to disclose their HC information, either based on internal regulations or external disclosure rules. Notably, North American firms are not required to disclose labour and related costs in the financial statements (annual reports) and other relevant reports, (i.e., voluntary disclosure) whereas companies in Asia and Europe are required to disclose specific human capital information (Lajili and Zéghal, 2006). Therefore, each year the companies disclose similar information allowed or requested by internal or external regulations.

The descriptive statistics for financial & non-financial HC scores are shown in Table 3.

Table 3 Financial &Non-Financial HC scores (2008-2010)

		Financial HC scores				Non-Financial HC scores				Paired-sample t test		
	year	N	Mean	Std.	Median	N	Mean	Std.	Median	Mean D.	t	Sig.
PD	2008	44	43.56	22.72	37.50	44	19.19	19.81	11.11	24.37	6.31	.00
	2009	44	40.34	22.37	33.33	44	15.40	18.13	11.11	24.94	7.08	.00
	2010	44	40.15	22.25	33.33	44	17.68	21.34	11.11	22.48	5.93	.00
TSt	2008	44	38.43	36.13	28.00	44	8.52	15.00	3.50	29.91	5.52	.00
	2009	44	33.86	35.80	22.50	44	6.95	12.19	1.00	26.91	5.48	.00
	2010	44	32.14	29.67	27.00	44	11.98	23.25	1.00	20.16	4.41	.00
TS	2008	44	12.80	7.40	11.00	44	3.02	3.91	1.50	9.77	8.69	.00
	2009	44	11.36	7.34	10.00	44	2.43	3.57	1.00	8.93	8.36	.00
	2010	44	11.02	6.69	10.00	44	2.82	4.03	0.50	8.2045	8.30	.00
Notes:												

PD: Percentage of Disclosure, calculated by numbers of subcategories disclosed in the reports in the financial or non-financial part of coding tables divided by the total number of subcategories in the financial or non-financial parts of the coding table.
TSt : Total Sentences = total qualitative information sentences+ total quantitative sentences
TS: Total scores= the sum of all the subcategories' qualitative scores (Financial &Nonfinancial) and quantitative scores (Financial &Nonfinancial).
Sig. is two tailed.

The comparison between Financial and Non-Financial HC scores through paired-sample t tests results shows a significant difference (the same results are also obtained through t-tests and non-parametric mean difference tests) with a significance level $p<0.01$. This indicates that the degree of disclosure of financial human capital information is much higher than the degree of disclosure of non-financial human capital information in the annual reports and CSR reports. The comparison of each variable for different years obtained through parametric t-tests and non-parametric tests indicates little difference (see Appendix Table 23).

The detailed descriptive statistics for the subcategories of employee, executive, director, and CSR scores (financial and non-financial) are shown in Table 4. The descriptive statistics for HC sentences are displayed in Table 5. The variable of total percentage of disclosure only works for aggregation; therefore, it cannot be displayed in this table.

Table 4 Statistics of employee, executive, director and CSR scores

	2008				2009				2010			
	N	Mean	Median	Std.	N	Mean	Median	Std.	N	Mean	Median	Std.
X1	44	1.45	1.00	1.27	44	1.32	1.00	1.14	44	1.25	1.00	1.16
X2	44	2.20	3.00	1.27	44	2.02	3.00	1.34	44	2.11	3.00	1.19
X3	44	1.14	0.50	1.32	44	0.70	0.00	1.13	44	0.93	0.00	1.26
X4	44	1.59	1.00	1.34	44	1.25	1.00	1.26	44	1.11	1.00	1.17
X5	44	0.77	0.00	1.16	44	0.89	0.00	1.33	44	0.82	0.00	1.28
X6	44	2.31	3.21	3.00	44	0.55	0.00	1.02	44	0.59	0.00	1.02
X7	44	2.73	3.00	1.87	44	1.05	0.00	1.28	44	0.96	0.00	1.26
X8	44	2.36	2.50	1.94	44	0.77	0.00	1.14	44	0.84	0.00	1.20
X9	44	0.30	0.00	0.85	44	0.25	0.00	0.72	44	0.16	0.00	0.61
X10	44	0.23	0.00	0.75	44	0.20	0.00	0.70	44	0.21	0.00	0.70
X11	44	5.93	6.00	3.32	44	0.18	0.00	0.66	44	0.11	0.00	0.54
X12	44	1.95	3.00	1.36	44	1.66	2.00	1.40	44	1.50	1.50	1.42
X13	44	1.77	1.50	1.61	44	2.00	1.00	2.06	44	1.82	1.00	1.69
X14	44	0.00	0.00	0.00	44	0.00	0.00	0.00	44	0.00	0.00	0.00
X15	44	0.14	0.00	0.41	44	0.14	0.00	0.51	44	0.27	0.00	0.82
X16	44	0.57	0.00	1.07	44	0.50	0.00	1.00	44	0.48	0.00	0.98
X17	44	0.18	0.00	0.54	44	0.18	0.00	0.66	44	0.18	0.00	0.54

X18	44	0.07	0.00	0.26	44	0.02	0.00	0.15	44	0.05	0.00	0.21
X19	44	0.96	0.00	1.31	44	0.73	0.00	1.23	44	0.96	0.00	1.31
X20	44	0.55	0.00	0.95	44	0.55	0.00	0.90	44	0.43	0.00	0.85
X21	44	0.39	0.00	0.78	44	0.30	0.00	0.77	44	0.36	0.00	0.78

Notes:

X1	Employee salary total score
X2	Employee stock-based compensation total score
X3	Employee incentives and other employee compensation total score
X4	Employee pension score
X5	Executive salary total score
X6	Executive pension total score
X7	Executive stock based compensation total score
X8	Executive option based compensation total score
X9	Executive non-equity incentive plan total score
X10	Director board retainers total score
X11	Director pension total score
X12	Director other compensation total score
X13	Pension scores
X14	Postretirement scores
X15	Workforce diversity & workplace priorities total score
X16	Health & safety total score
X17	Work condition and environment score
X18	Work dignity and protection total score
X19	Training & development total score
X20	Insurance plan total score
X21	Equal opportunity & against discrimination total score

Table 5 Statistics of employee, executive, director and CSR sentences

	2008				2009				2010			
	N	Mean	Median	Std.	N	Mean	Median	Std.	N	Mean	Median	Std.
X1	44	3.07	1.00	4.22	44	2.36	1.00	3.41	44	2.32	1.00	4.18
X2	44	10.7	8.00	10.2	44	8.71	6.50	9.07	44	8.20	7.00	7.40
X3	44	4.02	0.50	6.96	44	2.34	0.00	5.26	44	3.30	0.00	6.39
X4	44	4.95	2.50	6.69	44	4.71	2.00	7.26	44	4.91	3.00	6.72
X5	44	1.25	0.00	2.71	44	2.59	0.00	6.48	44	2.20	0.00	4.47
X6	44	0.93	0.00	2.50	44	0.71	0.00	1.52	44	0.80	0.00	1.75
X7	44	4.02	0.00	8.06	44	3.71	0.00	6.25	44	3.16	0.00	6.70
X8	44	2.23	0.00	4.93	43	1.79	0.00	3.69	44	1.55	0.00	2.65
X9	44	0.36	0.00	1.69	44	0.25	0.00	1.08	44	0.11	0.00	0.49
X10	44	1.21	0.00	4.21	44	0.34	0.00	1.68	44	0.23	0.00	0.86
X11	44	0.43	0.00	1.91	44	0.32	0.00	1.16	44	0.14	0.00	0.77
X12	44	4.48	1.50	6.45	44	6.09	3.00	8.75	44	5.23	2.00	8.25
X13	44	5.23	3.00	7.20	44	5.77	2.00	8.71	44	0.00	0.00	0.00
X14	44	0.00	0.00	0.00	44	0.00	0.00	0.00	44	5.89	4.00	7.11
X15	44	0.16	0.00	0.53	44	0.52	0.00	1.82	44	0.84	0.00	3.05
X16	44	2.68	0.00	8.16	44	2.21	0.00	5.12	44	3.59	0.00	11.1
X17	44	0.36	0.00	1.31	44	0.30	0.00	1.09	44	0.57	0.00	1.77
X18	44	0.07	0.00	0.26	44	0.02	0.00	0.15	44	0.07	0.00	0.33

X19	44	2.75	0.00	4.51	44	2.27	0.00	4.19	44	5.25	0.00	9.78
X20	44	1.50	0.00	3.53	44	0.96	0.00	1.85	44	0.71	0.00	1.49
X21	44	1.27	0.00	3.32	44	0.64	0.00	2.35	44	0.61	0.00	1.45

Notes:

X1	Employee salary total sentences
X2	Employee stock-based compensation total sentences
X3	Employee incentives and other employee compensation total sentences
X4	Employee pension sentences
X5	Executive salary total sentences
X6	Executive pension total sentences
X7	Executive stock based compensation total sentences
X8	Executive option based compensation total sentences
X9	Executive non-equity incentive plan total sentences
X10	Director board retainers' total sentences
X11	Director pension total sentences
X12	Director other compensation total sentences
X13	Pension sentences
X14	Postretirement sentences
X15	Workforce diversity & workplace priorities total sentences
X16	Health & safety total sentences
X17	Work condition and environment sentences
X18	Work dignity and protection total score
X19	Training & development total score
X20	Insurance plan total score
X21	Equal opportunity & against discrimination total score

Moreover, another interest topic would be to examine whether there exists any difference of the degree of disclosure between the top company and the following ones. Here we selected google, which is at the first position in the 2010 Universum rank to compare its disclose score with the mean of the others

As shown in Figure 2, Google's financial scores is lower than the mean of the rest of the groups' scores in the year of 2008 and 2010 and it is higher than the mean of the rest of groups' scores in the year of 2009. Generally, there is no big difference between them. Therefore, it seems that the rank order is not correlated with disclosure scores.

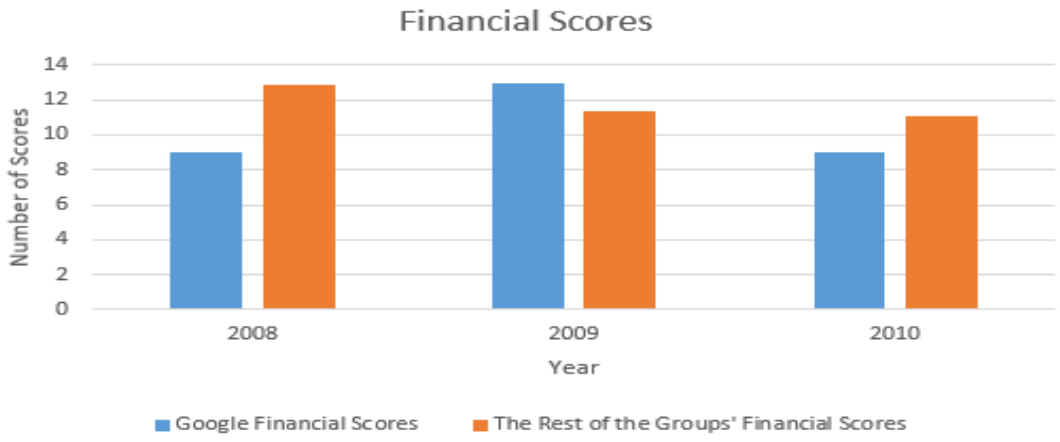

Figure 2. Comparison between Google financial scores and the mean of the rest of the groups' financial scores

4.1.2 Data internal validity

Before testing the hypotheses proposed, all of the data collected to measure human capital disclosure should be validated. The descriptive statistics, taken the year of 2010 as an example are shown in Table 6.

Table 6. The descriptive statistics table for business and engineering HC disclosure scores 2010

	N	Mean	Std.	Minimum	Maximum
Total Score (Business)	31	13.06	8.70	0.00	40.00
Total Sentences (Business)	31	42.32	47.91	0.00	213.00
Total Percentage of Disclosure (Business)	31	28.26	18.23	0.00	71.43
Total Score (Engineering)	33	13.18	8.35	0.00	40.00
Total Sentences (Engineering)	33	43.09	46.80	0.00	213.00
Total Percentage of Disclosure (Engineering)	33	28.28	17.04	0.00	71.43

As can be observed in Table 6, 31 companies in the business Universum list and 33 companies in the engineering Universum list were selected for data validations.

The validation procedure is accomplished by checking the internal correlations between the measured total score, total sentences, and total percentage of disclosure. Since all of these variables are measuring the disclosure of human capital, and all of them are collected independently, a high correlation between these variables is expected. Table 7 displays the Pearson

correlation between the measured total score, total sentences, and total percentage of disclosure for business and engineering lists for the year of 2010, respectively.

Table 7 Business statistics (Pearson Correlation)

Variable	BTS	BTPD	BTSt
BTS	1		
BTPD	.836**	1	
BTSt	.952**	.820**	1

Engineering statistics (Pearson Correlation)

Variable	ETS	ETPD	ETSt
ETS	1		
ETPD	.844**	1	
ETSt	.944**	.835**	1

**P<0.01.
Business N=31
BTS: Business Total Score
BTPD: Business Total Percentage of Disclosure
BTSt: Business Total Sentences
Engineering N=33
ETS: Engineering Total Score
ETPD: Engineering Total Percentage of Disclosure
ETSt: Engineering Total Sentences

As can be seen in Table 7, the correlations between these variables in both business and engineering fields are positive and statistically significant. For example, the correlation between BTSt and BTS is as high as 0.952, which indicates that the more sentences stated in the report, the higher the disclosure score (both qualitative and quantitative information). The other high correlation values expressed the similar phenomenon. Therefore, the above results show strong internal scores validity of our collected data.

4.2 Relationship between Universum rank and human capital disclosure scores

To test hypothesis H1 according to which a higher degree of disclosure of both financial and non-financial information from annual reports, CSR reports and other related reports is associated with a higher company rank in the universum list, the spearman correlation technique was used. In this study, we tested the HC scores of the companies within the top 50 Universum rank lists for business and Engineering fields, respectively. The correlation results are displayed in Table 8.

Table 8 Correlation between Universum rank and human capital disclosure scores (2010)

Panel A: Business statistics (Spearman Correlation)				
Variable		BTPD	BTSt	BTS
BUR	Correlation	0.068	0.321	0.047
	Sig.	.715	.078	.801
Panel B: Engineering statistics (Spearman Correlation)				
Variable		ETPD	ETSC	ETS
EUR	Correlation	0.120	0.068	-0.032
	Sig.	.505	.706	.861

For Business: N=31
For Engineering: N=33
BTS: Business Total Score
BTSt: Business Total Sentences
BTPD: Business Total Percentage of Disclosure
BUR: Business Universum Rank
ETSC: Engineering Total Score
ETS: Engineering Total Sentences
ETPD: Engineering Total Percentage of Disclosure
EUR: Engineering Universum Rank

As shown in Table 8, the correlation between the 'Business Universum rank' and 'Business Total Sentences' corresponds to a positive value of 0.32 with a significance level of $P=0.078<0.1$. This result indicates that the more sentences about human capital disclosed in the issued reports (e.g. annual report and CSR report) the higher the Universum rank (in business) a company will have. However, the other correlation coefficients, as can be observed in Table 8, are rather small (not significant) with the variables of total percentage of disclosure, total sentences (in engineering), and total score have no relationship to a company's Universum rank. Therefore, the hypothesis of 'higher degree of human capital information disclosure can have higher company rank order in the Universum list is partially accepted.

Based on the above analysis, we conclude that the ranking of the world's top 50 attractive employers provided by Universum has a weak relationship to the companies' reports. In other words, people choose the company they would like to work for not only based on finding human resource information in the issued reports, but also may base their preference on the information disclosed through some other approaches such as advertisements, recruitment fairs, or simply recommendations by others (e.g., branding).

4.3 Relationship between human capital disclosure scores and human capital variables

This section focuses on whether there exists a positive correlation between human capital disclosure scores and human capital variables. The purpose is to figure out whether a company providing higher employee welfare (e.g., salaries, bonuses, pensions etc.) will also provide more human capital information disclosures in the annual report and CSR report, as well as to discover which human capital variables have more impact on human capital disclosure scores.

Altman (1983) proposed a z-score model based on financial statement ratios and multiple discriminant analysis to predict bankruptcy for publicly traded manufacturing firms. The z-score method classifies the companies into bankruptcy and non-bankruptcy groups. In this section, the z-score method combined with regression analysis is utilized to validate the human capital index and check the statistical significance of its main components.

The research question addressing the relationship between human capital disclosure scores and human capital variables can be examined using regression analysis. Based on the z-score model, the human capital disclosure scores are transformed into dummy variables (the variable is coded as 1=higher than median, 0=lower than median). The logistic regression method is used to analyze the relationship between human capital disclosure scores and human capital variables. The general logistic regression model can be expressed as:

$$Y_i = log_e\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \varepsilon$$

where Y_i is binary observations, p is the probability of the variable $(0 \leq p \leq 1)$, β_0 is constant coefficients, and β_1 is the regression coefficient of independent variable X_1, β_2 is the coefficient of independent variable X_2, and ε is the regression error.

4.3.1 Dependent variable and independent variables

In this analysis, the following dependent variables are considered:

1) Total score: coded as 1=higher than median, 0=lower than median.

2) Total sentences: coded as 1=higher than median, 0=lower than median.

3) Total percentage of disclosure: coded as 1=higher than median, 0=lower than median.

In this study, there are 30 human capital variables considered as the independent variables at the beginning. The data of these variables are collected from the secondary data (both of Bloomberg and Compustat databases), as is shown in Table 9.

Table 9 Human capital variables

Group	Var.	Variable definition
1	X1	XLR: represents the costs of employees' wages and benefits allocated to continuing operations and includes incentive compensation, other benefit plans, payroll taxes, pension costs, profit sharing, and salaries and wages.
	X2	Personnel expense: Includes wages and salaries, social security, pension, profit-sharing expenses and other benefits related to personnel.
2	X3	Number of employees
3	X4	Employee training cost: Amount the company spent on employee training during the reporting period.
	X5	Training spending per employee: an indicator that measures a company's commitment to enhancing their employees' competencies.
	X6	Total hours spent by firm employee Training: Hours the company spent on employee training during the reporting period as reported by the company.
4	X7	Total salaries and bonuses paid to executives: Total amount of salaries and bonuses paid to executive.
	X8	Total Bonuses paid to executive: Total amount of bonuses the company paid to the executives.
	X9	Total compensation paid to executive: Total amount of compensation paid to executives.
	X10	Total stock awards given to executives: Total amount of stock awards paid to executives
	X11	Total non-equity incentives paid to executives
	X12	All other compensation paid to executives
5	X13	Total amount of salaries and bonuses paid to CEO
	X14	Total Bonuses paid to CEO and equivalent.
	X15	Total compensation paid to CEO and equivalent.
	X16	All other compensation paid to CEO and equivalent.
	X17	Total stock awards given to CEO and equivalent.
	X18	Total non-equity incentive given to CEO and equivalent
	X19	Total salaries paid to CEO and equivalent.
6	X20	Pension postretirement expense
	X21	Pension plans Long-term rate of return: the dividends, interest, and capital gains generated by assets held in a company's pension fund
	X22	Pension plans service cost: The present value of the projected retirement benefits earned by plan participants in the current period

	X23	Pension plans rate of return
	X24	Pension benefits paid
	X25	Pension employer contribution: The fraction of a pension plan's cost paid by the employer
	X26	Pension plan assets: the funds a company will use to meet its future compensation obligations to retired employees.
	X27	Pension expense: the amount reported in the income statement related to a company's pension plan
	X28	Employee contribution: a company-sponsored retirement plan where employees may elect to have a portion of each paycheck deposited into a retirement account owned by the employee and held in his or her name.
7	X29	Pension funding ratio: The ratio of an annuity or pension's assets to it liabilities.
8	X30	Pension obligation: an actuarial liability equal to the present value of liabilities earned and the present value of liability from future compensation increases.

It is worthwhile noting that not all of these variables can be applied in the regression analysis simultaneously, because of the following reasons:

1) There exists multicollinearity between these variables which needs to be checked and eliminated before processing the logistic regression analysis;

2) Some of these variables have considerable numbers of missing values, since many companies did not provide precise and transparent information on human capital.

For the completeness and accuracy of the regression analysis, the following steps and rules are made for selecting the independent human capital variables:

a) Classifying the variables into groups, each group reflects similar information of human capital (as is displayed in Table 9);

b) Exclude the variables with more than 2/3 missing values;

c) Based on Le, Gibon and Oxley's cost and income-based human asset measurement method, select the variables from each group which are related to the following human capital proxy: employee numbers, employee salaries, pensions, reserved funds and training on employees. After this step, there are 20 variables selected out, as is shown in Table 10;

d) Checking the multicollinearity between the selected variables by examining the correlations between variables (the correlation table is shown in Table 24 in the appendix);

e) Based on the correlation results, classifying the variables into groups (as is displayed in

f) Table 10), where the variables in each group have correlations bigger than 0.7 and the variables between groups have relatively lower correlations;

g) For each group, select the variable that has minimum missing values as the independent variable.

For example, in Table 10, the variables XLR (Y1), Personnel expense (Y2), Number of employees (Y3) and Training spending per employee (Y5) are highly correlated, therefore, they are classified into one group (group 1). Because the variable 'number of employees' has the minimum missing values compared to the other members in this group, 'number of employee' is selected as the independent variable.

Table 10 The Selected candidate variables

Group	Variable	Variable Explanation
1	X1	XLR: the amount of money it pays to all of its direct labor employees over a specific period.
1	X2	Personnel expense: Includes wages and salaries, social security, pension, profit-sharing expenses and other benefits related to personnel.
1	X3	Number of employees
2	X4	Total amount of salaries and bonuses paid to executives
1	X5	Total amount of bonuses the company paid to the executives
3	X6	Total amount of compensation paid to executives
3	X7	Total amount of stock awards paid to executives
3	X8	All other compensation paid to executives
2	X9	Total amount of salaries and bonuses paid to CEO
4	X10	Total compensation paid to CEO and equivalent
4	X11	All other compensation paid to CEO and equivalent
3	X12	Total stock awards given to CEO and equivalent
4	X13	Total salaries paid to CEO and equivalent
5	X14	Pension postretirement expense
5	X15	Pension plans service cost: The present value of the projected retirement benefits earned by plan participants in the current period
5	X16	Pension benefits paid: Pension benefits paid
5	X17	Pension employer contribution: The fraction of a pension plan's cost paid by the employer

5	X18	Pension expense: the amount reported in the income statement related to a company's pension plan
5	X19	Employee contribution: a company-sponsored retirement plan where employees may elect to have a portion of each paycheck deposited into a retirement account owned by the employee and held in his or her name
5	X20	Pension obligation: an actuarial liability equal to the present value of liabilities earned and the present value of liability from future compensation increases

Table 11. The descriptive statistics of 20 selected human capital variables

	2008				2009				2010			
	N	Mean	Median	Std.	N	Mean	Median	Std.	N	Mean	Median	Std.
X1	18	13132.58	12838.30	7805.39	18	14318.62	14512.50	8861.44	18	15010.45	15222.50	9355.23
X2	18	12782.28	12024.63	8340.42	18	13514.08	13599.96	8729.56	19	14262.76	14178.86	8963.03
X3	41	149.86	92.00	113.14	41	151347.54	115500	108449.17	42	156477.91	112300	112088.56
X4	36	8718813.92	5854972.00	6566827.76	36	9047995.14	6222505.00	7473856.80	38	11067172.55	7644479.50	8944991.38
X5	36	3982101.64	1708970.00	5036566.87	36	4463879.46	2414204.50	6195891.96	38	5925739.81	3058595.50	7729870.66
X6	29	49535587.55	32871895.00	41140798.19	31	43662165.39	41383302.00	30044815.39	38	47355330.96	43854829.00	36591465.34
X7	25	20182568.48	12158111.00	20007040.45	27	16116716.04	14571835.00	14784378.00	28	23274928.21	16868042.50	30772174.89
X8	29	41909614.58	28195300.00	38298435.29	30	36360269.20	35516338.00	30709591.05	35	37828855.39	33422110.00	37100746.62
X9	28	3121992.69	2170685.00	2597654.97	32	2628119.55	1821580.00	2131925.90	37	3264890.46	2819455.00	2390503.85
X10	27	17099494.19	12407800.00	18543070.85	28	15298185.39	13691206.50	16261323.88	36	15836781.75	13615825.50	13938152.85
X11	21	16995813.21	13972600.00	18993807.97	26	13464267.01	10541276.50	16748664.07	33	13147071.17	9045228.00	14673569.15
X12	20	7352281.85	4791575.00	6213280.53	22	6932489.05	6109142.50	6108305.98	23	6721276.83	6236800.00	4768174.73
X13	36	1597239.94	1675615.00	769206.89	36	1444608.13	1566945.00	791143.09	40	1623178.93	1602476.50	875997.18
X14	39	485.56	361.00	552.42	40	683.44	407.05	737.96	42	742.76	489.69	791.18
X15	35	396.90	312.00	359.74	34	392.73	286.50	374.42	35	404.58	322.44	327.93
X16	35	1079.42	535.00	1494.26	35	1164.11	570.41	1561.14	35	1120.77	584.00	1444.77
X17	35	497.65	332.66	434.70	35	696.75	540.00	780.58	35	632.75	556.00	483.36
X18	39	269.48	154.69	440.31	39	451.26	341.00	585.08	39	508.77	271.00	685.37
X19	32	524.57	379.49	445.90	33	741.55	546.08	816.79	35	644.62	567.00	480.27
X20	18	13132.58	12838.30	7805.39	36	5061.06	2064.50	6458.89	34	4732.13	2397.30	5470.71

Based on the above variable selection steps and classification method, there are 5 human capital variables selected to analyze the relationship between human capital disclosure scores and human capital variables, the corresponding correlation table is shown in Table 12.

Table 12 Correlation between selected human capital variables (2010)

	X1	X2	X3	X4	X5
X1	1				
Sig. (2-tailed)					
X2	.104	1			
Sig. (2-tailed)	.535				
X3	-.014	.192	1		
Sig. (2-tailed)	.933	.269			
X4	.303	.055	-.126	1	
Sig. (2-tailed)	.072	.760	.464		
X5	.457	.169	.059	.260	1
Sig. (2-tailed)	.009	.382	.761	.191	

Notes:
X1 ln Number of employee
X2 ln Total amount of salaries and bonuses paid to executives
X3 ln Total amount of compensation paid to executives
X4 ln Total compensation paid to CEO and equivalent
X5 ln Pension expense: the amount reported in the income statement related to a company's pension plan.

Considering the values of human capital variables are far greater than the value of human capital disclosure scores, the natural logarithm is used to transform the human capital variables.

4.3.2 Regression results and analysis

The data of the year of 2010 is used as a representative sample for evaluating the relationship between the degree of disclosure and human capital index. The regression results for the logistic regression are displayed in Table 13.

Table 13 The logistic regression results of the year of 2010

	Total score		Total sentences		Total percentage of disclosure	
	B	Sig.	B	Sig.	B	Sig.
X1	.152	.841	1.109	.133	-.017	.982
X2	1.243	.182	1.523	.108	.790	.360
X3	-1.970	.172	-3.936	.029	-1.590	.241
X4	1.218	.299	1.559	.167	1.201	.286

X5	-1.321	.045	-.781	.224	-1.083	.066
constant	.643	.968	10.207	.549	2.331	.881
N		44	44		44	
-2log likelihood		26.799	24.384		28.304	
Cox &Snell R square		0.269	0.336		0.213	
Nagelkerke R square		0.358	0.448		0.286	

Notes:
X1 ln Number of employees
X2 ln Total amount of salaries and bonuses paid to executives
X3 ln Total amount of compensation paid to executives
X4 ln Total compensation paid to CEO and equivalent
X5 ln Pension expense: the amount reported in the income statement related to a company's pension plan.

As is shown in Table 13, the independent variables 'Total amount of compensation paid to executives'(X3) and 'Pension expense (X5)' have significant explanatory power (P<0.1) to the dependent variables ('total score', 'Total sentences' and 'total percentage of disclosure') and the regression coefficients of these variables are negative in the year of 2010. However, the regression results for the year of 2008 indicate that only 'Pension expense (X5)' is significantly correlated with the dependent variables but corresponds to positive regression coefficients (in Table 25 in appendix). Moreover, there is no variable with a significant correlation with the human capital disclosure scores in the year of 2009 (Table 26 in appendix).

The issue of whether a company with higher employee welfare (e.g., salaries, bonuses, pensions etc.) will disclose more human capital information disclosed in the annual report and CSR report is controversial. Therefore, the conclusion can be made that there is no evidence to support the hypothesis that 'a company provide higher employee benefits and welfares (salaries, bonuses, pensions etc.) is positively related to human capital information disclosed in the annual report, CSR report, and other relevant reports. Moreover, human capital variables do not appear to affect human capital disclosure scores.

4.4. Relationship between the HC disclosure scores and firm performance

The research question regarding whether a higher degree of disclosure of financial and non-financial human resource information is related to a better firm performance is discussed in this section. It is worth noting that the effect of the HC disclosure scores normally has a lagged effect

on firm performance. For example, the HC information disclosed in 2008 may have no effect on the firm performance of the same year, because the financial activities have been carried when disclosing the human capital information. However, the disclosed HC information may have an effect on the firm performance of the future years such as 2009, 2010, and 2011, etc.

4.4.1 Dependent and Independent variables

In order to validate hypothesis H2 according to which a higher human capital index based on the disclosure of financial and non-financial human resource information is positively associated with firm performance, the following dependent variables are selected as proxies for firm performance.

1) Price to book ratio: a market-based firm performance proxy defined as Price-Fiscal year-close multiplied by Common Shares Outstanding divided by common equity-total as of the company's fiscal year-end, which represents the common shareholders' interest in the company (Compustat P. 16-18).

2) EBITDA Margin: an operating/profitability firm performance proxy defined as the earnings before interest and taxes and depreciation annual, quarterly, or 12 months moving divided by net sales annual, quarterly, or 12 months moving (Compustat).

The independent and control variables are defined below:

1) Total percentage of disclosure: defined as the sum of the total financial and non-financial disclosure percentage. This variable is calculated by using the total numbers of subcategories disclosed in the reports divided by the total numbers of subcategories.

2) Total sentences: total qualitative information sentences (financial and non-financial) + total quantitative information sentences (financial and non-financial). The numbers of sentences are counted by reviewing annual reports and CSR reports.

3) Total score : total qualitative score (financial and non-financial) + total quantitative score (financial and non-financial).

In the previous studies, Aragón-Correa et al. (2016) point out that "company size, industry type, and geographic location significantly affect voluntary disclosure" (p27). Moreover, company size has been measured by either ln (assets), number of employees, total asset value, or sales volume (Hackston &Milne, 1996; Cloyd, 1996; Bekiris, 2013). In order to have robust results from testing and verifying H2, the variables of firm size, country (US=1 or Non US=0), industry type (service =1 or non-service=0) and year (2008, 2009, 2010) are set as control variables. In this study, firm size is measured by ln (assets) which is calculated as the natural logarithm of each company's total assets.

4.4.2 OSL regression results and analysis

The research question of whether a higher degree of disclosure of financial and non-financial human resource information is related with a better firm performance is discussed below. The OLS linear regression is firstly utilized to examine this hypothesis H2, where firm size (ln assets), industry type (service 1, no service 0), and country are considered as control variables. The general OLS regression model can be expressed as follows:

$$P = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

where P is the dependent valuable, β_0 is the constant regression value, β_1 to β_5 are the regression coefficients, X_1 to X_5 are lagged independent variables, ε is the regression error.

The data of the year of 2010 is selected as an example showing the OLS regression results. As mentioned earlier, the independent variables are lagged values, for example, as is shown in utilized are from the year of 2010.

Table 14, the value of the dependent variables (Price to Book and EBITDA Margin) utilized belong to the year of 2011 while the value of independent variables (i.e., total scores, total sentences and total percentage of disclosure) utilized are from the year of 2010.

Table 14 OLS Regression results disclosure scores and firm performance

A. OLS regression results for lag independents (2010 total score) VS 2011 firm performance

	Price to Book				EBITDA Margin			
	B	t	Sig.	VIF	B	t	Sig.	VIF
Log(TS)	.242	.227	.822	1.118	-4.649	-.903	.374	1.028
ln(Assets)	-1.064	-3.954	.000	1.315	-.138	-.074	.941	1.181
Service	1.005	1.310	.199	1.273	12.847	2.668	.012	1.140
Country	1.267	2.058	.048	1.011	12.786	4.189	.000	1.068
Constant	13.993	4.564	.000		18.021	.859	.397	
N	37				35			
R Square	0.110				0.491			

B. OLS regression results for lag independents (2010 total sentences) VS 2011 firm performance

	Price to Book				EBITDA Margin			
	B	t	Sig.	VIF	B	t	Sig.	VIF
Log(TSt)	.035	.048	.962	1.125	-1.985	-.572	.572	1.071
ln(Assets)	-1.056	-3.829	.001	1.377	-.143	-.075	.941	1.222
Service	1.027	1.348	.187	1.256	12.634	2.604	.014	1.138
Country	1.276	2.068	.047	1.015	12.969	4.226	.000	1.062
Constant	14.080	4.628	.000		15.997	.760	.453	
N	37				35			
R Square		0.09			0.49			

C. OLS regression results for lag independents (2010 total percentage of disclosure) VS 2011 firm performance

	Price to Book				EBITDA Margin			
	B	t	Sig.	VIF	B	t	Sig.	VIF
Log(TPD)	.555	.581	.565	.876	-5.005	-1.103	.279	1.041
ln(Assets)	-1.091	-4.030	.000	.745	-.016	-.009	.993	1.195
Service	.973	1.275	.211	.786	12.997	2.714	.011	1.142
Country	1.268	2.076	.046	.996	12.656	4.165	.000	1.073
Constant	13.800	4.502	.000		18.717	.897	.377	
N	37				35			
R Square		0.115			0.496			

As can be seen in Table 14, the significance levels of the independent variables Log (TS), Log (TSt) and Log (TPD) in Panel C are all larger than 0.05, which indicate that these variables have no explanatory power and no correlation to the dependent variables. The low VIF value indicates that there is no multi-collinearity between the independent variables. The regression results of the data of 2008 and 2009 displayed in Table 27 and Table 28 at appendix also reveal that most of the regression significances are far more than 0.05 and the significance of the regression coefficients are unstable. For example, the independent variable ‘log (total scores)’ has

a positive sign on regression coefficients in the data of 2008 and 2010, but has a negative sign in the data of 2009.

4.4.3 Panel data regression results and analysis

In order to evaluate the effect of HC information disclosed in previous years (2008 and 2009) on the firm performance of following years, another regression analysis based on panel data-set (where all of the data in three years are pooled together) is performed. The random-effects OLS regression model is selected to perform the panel data regression based on the results of Hausman test. The equation for the random-effects OLS regression model can be expressed as:

$$Y_{it} = \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + a_{it} + u_{it} + \varepsilon_{it}$$

where Y_{it} is the dependent variable, β_1, β_2, and β_3 the coefficients for independent variables, a_{it} is the unknown intercept for each entity, u_{it} is the between-entity error and ε_{it} is within-entity error.

As mentioned earlier, the effect of the HC disclosure scores normally has lagged effects on firm performance. The firm performance of the year of 2010 may not only be affected by the HC information disclosed in 2009, but also the data disclosed in 2008 or even prior years. As such, we controlled year in the panel data regression analysis. The above random-effects regression model can be modified as:

$$Y_{it} = \beta_1 X_{it} + \beta_2 X_{it} + \beta_3 X_{it} + \beta_4 Year_{t-1} + \beta_5 Year_{t-2} + a_{it} + u_{it} + \varepsilon_{it}$$

where $Year_{t-1}$ and $Year_{t-2}$ are dummy variables, β_4 and β_5 are corresponding coefficient (or effect). The regression results for the panel data, take 2010 as the base year, are shown in Table 15.

Table 15 Panel data regression results (2008-2010)

Panel A Panel data regression results for lagged independents log (total scores)

	Price to Book Ratio				EBITDA Margin			
	B	Robust Std. Err.	z	P>|z|	B	Robust Std. Err.	z	P>|z|
Log(TS)	-0.061	0.933	0.060	0.948	0.299	1.062	0.280	0.778
ln(Assets)	-0.337	0.373	0.900	0.367	-1.216	1.213	1.000	0.316
Service	0.632	1.145	0.550	0.581	-5.579	5.238	1.070	0.287
Country	0.448	0.825	0.540	0.587	11.558	2.861	4.040	0.000
2008	-0.375	0.347	1.080	0.280	-0.395	0.710	0.560	0.578
2009	-0.902	1.023	0.880	0.378	0.700	0.485	1.440	0.149
Constant	6.187	4.773	1.300	0.195	25.510	13.905	1.830	0.067
Number of observations		126			122			
Number of groups		44			44			
R-sq.		within = 0.0121			within = 0.0034			
		between = 0.0443			between = 0.3198			
		overall = 0.0375			overall = 0.3023			
Prob > chi2		0.7420			0.000			
rho		0.2619			0.9566			

Panel B Panel data regression results for lagged independents log (total sentences)

	Price to Book Ratio				EBITDA Margin			
	B	Robust Std. Err.	z	P>|z|	B	Robust Std. Err.	z	P>|z|
Log(TSt)	0.088	0.530	0.170	0.868	0.443	0.823	0.540	0.590
ln(Assets)	-0.350	0.377	0.930	0.353	-1.240	1.210	1.020	0.305
Service	0.631	1.128	0.560	0.576	-5.569	5.245	1.060	0.288
Country	0.447	0.798	0.560	0.576	11.523	2.884	4.000	0.000
2008	-0.385	0.360	1.070	0.285	-0.404	0.709	0.570	0.569
2009	-0.898	1.019	0.880	0.378	0.706	0.485	1.450	0.146
Constant	6.153	4.674	1.320	0.188	25.480	13.881	1.840	0.066
Number of observations		126			122			
Number of groups		44			44			
R-sq.		within = 0.0012			within = 0.0027			
		between = 0.0479			between = 0.3203			
		overall = 0.0387			overall = 0.3025			
Prob > chi2		0.7514			0.000			
rho		0.2602			0.9567			

Panel C Panel data regression results for lagged independents log (total percentage of disclosure)

	Price to Book Ratio				EBITDA Margin			
	B	Robust Std. Err.	z	P>|z|	B	Robust Std. Err.	z	P>|z|
Log(TPD)	0.827	0.962	0.860	0.390	-0.056	1.437	0.040	0.969
ln(Assets)	-0.420	0.372	1.130	0.259	-1.196	1.225	0.980	0.329
Service	0.634	1.101	0.580	0.565	-5.567	5.251	1.060	0.289
Country	0.480	0.801	0.600	0.549	11.533	2.853	4.040	0.000

2008	-0.435	0.377	1.150	0.248	-0.367	0.702	0.520	0.601
2009	-0.903	1.005	0.900	0.369	0.697	0.492	1.420	0.156
Constant	5.929	4.533	1.310	0.191	25.675	13.997	1.830	0.067
Number of observations		126			122			
Number of groups		44			44			
R-sq.		within = 0.0025 between = 0.0562 overall = 0.0431			within = 0.0070 between = 0.3176 overall = 0.3008			
Prob > chi2		0.5542			0.000			
rho		0.2576			0.9566			

In Table 15, Panel A to Panel C display the regression results for each target independent variable (total scores, total sentences and total percentage of disclosure) and control variables. As can be seen in Table 15, the regression significance for all of the independent variables, control variables the dummy variable are far more than 0.05, which indicate that there is no correlations between the independent and dependent variables. Moreover, for the dependent variable 'Price to Book Ratio', all of the values of 'Prob > chi2' in panel data regression are larger than 0.05. Therefore, one can conclude that the human capital information disclosed in previous years has no effect on the firm performance of the future years. Therefore, hypothesis H2 (i.e., higher degree of disclosure of financial and non-financial human resource information is related with a better firm performance) has been rejected.

An interesting result observed in Table 15 is that the independent variable 'country' has a significance level <0.001 to the dependent variable EBITDA Margin in all of the different models. The corresponding positive coefficients indicate that companies in the US will have a strong tendency to have higher EBITDA Margin.

4.5 Will better firm performance lead to a higher degree of human capital disclosure?

This section addresses the issue of whether better firm performance will lead to higher degree of disclosure of financial and non-financial human resource information. The OLS regression method is utilized. Table 16 displays the regression significance of the independent variables ('price to book ratio', 'ln (Assets)', 'service', and 'country') to the dependent variables (log (total scores), log (total sentences), and log (total percentage of disclosure)).

Table 16 OLS Regression results disclosure scores and firm performance (2010)

A. Regression results for Price to Book, Log(TS) and Log(TSt)

	Log(TS)				Log(TSt)			
	B	t	Sig.	VIF	B	t	Sig.	VIF
Constant	-4.73	-0.305	0.762		-60.01	-0.736	0.467	
Price to Book	-0.227	-0.887	0.381	1.082	-0.14	-0.104	0.918	1.082
ln(Assets)	1.551	1.166	0.252	1.351	8.814	1.261	0.216	1.351
Service	2.659	0.707	0.485	1.291	-9.44	-0.477	0.636	1.291
Country	0.279	0.093	0.926	1.006	5.741	0.365	0.717	1.006
N		37			37			
R Square		0.107			0.087			

B. Regression results for Price to Book and Log(TPD)

	Log(TPD)			
	B	t	Sig.	VIF
Constant	-7.382	-0.236	0.815	
Price to Book	-0.521	-1.009	0.32	1.082
ln(Assets)	3.327	1.239	0.224	1.351
Service	6.531	0.859	0.396	1.291
Country	-2.79	-0.462	0.647	1.006
N	37			
R Square	0.160			

C. Regression results for EBITDA Margin, Log(TS) and Log(TSt)

	Log(TS)				Log(TSt)			
	B	t	Sig.	VIF	B	t	Sig.	VIF
Constant	3.052	0.159	0.874		-17.315	-0.158	0.876	
EBITDA Margin	-0.073	-0.432	0.668	1.927	-0.31	-0.321	0.75	1.927
ln(Assets)	1.055	0.633	0.532	1.105	5.652	0.592	0.558	1.105
Service	-0.049	-0.01	0.992	1.39	-13.64	-0.466	0.645	1.39
Country	-1.251	-0.359	0.722	1.586	4.401	0.221	0.827	1.586
N		35			35			
R Square		0.058			0.034			

D. Regression results for EBITDA Margin and Log(TPD)

	Log(TPD)			
	B	t	Sig.	VIF
Constant	19.401	0.491	0.627	
EBITDA Margin	-0.293	-0.844	0.405	1.927
ln(Assets)	1.388	0.404	0.689	1.105
Service	1.702	0.161	0.873	1.39
Country	-2.22	-0.309	0.759	1.586
N	35			
R Square	0.080			

Notes:
Log(TS)= log (total scores)

Log(TSt)= log (total sentences)
Log(TPD)= log (total percentage of disclosure)

As can be seen in Table 16 the regression significance for all of the three independent variables Log (TS), Log (TSt) and Log (TPD) are larger than 0.05which indicate that these variables have no explanatory power and there is no correlation to the dependent variables. Regression results of the data of 2008 and 2009 (Table 29 and Table 30 at appendix) revealed the same conclusion. Therefore, better firm performance does not lead to higher degree of human capital disclosure, which further validated the results made in section 4.2 -- the HC information disclosed by a company is either based on its internal regulations or external disclosure rules.

4.6 Will higher human capital lead to better firm performance during economic crisis years?

Investigating the effect of human capital on firm performance has always been considered critical in the information age. Whether human capital is positively and significantly related to firm performance remains controversial. Many scholars demonstrated that firm performance is significantly and positively related to human capital (Lewellen et al., 1992). However, some other researchers, such as Leonard (1990), Zhou et al. (2011) and Wilson et al (1992) conclude that the correlation between human capital and firm performance is not significant. In this section, we focus on analyzing this dispute using the data collected during the economic crisis years (2008-2010).

4.6.1 Dependent and Independent variables

In this analysis, the variable of Price-to-book Ratio and EBITDA Margin utilized in section 4.5 are considered as the proxies to measure firm performance, where Price-to-book Ratio represents a market-based firm performance proxy and EBITDA Margin stands for operating/profitability based firm performance.

The same human capital variables used in section 4.4 are considered to represent human capital.

4.6.2 Regression results and analysis

The data of the year 2010 is used as a representative sample for evaluating the effect of the value of human capital variables on firm performance. In this analysis, the independent variables are human capital variables, and the dependent variables are firm performance proxies. The regression results are displayed in Table 17.

Table 17 OLS regression results of the effect of human capital variables on firm performance (2010)

	Price to Book Ratio				EBITDA Margin			
	B	t	Sig.	VIF	B	t	Sig.	VIF
X1	.578	.173	.865	1.208	-3.965	-1.809	.0379	1.215
X2	-1.989	-.695	.496	1.373	-8.859	-2.190	.046	1.737
X3	-2.399	-.549	.590	2.153	5.327	.897	.385	4.089
X4	.235	.065	.949	2.294	2.596	.425	.677	4.069
X5	-.963	-.529	.603	1.234	1.465	.677	.509	1.297
Constant	70.165	.843	.411		65.089	.758	.461	
N	20				23			
R Square	0.525				0.119			

Notes:
Independent variables:
X1 ln Number of employee
X2 ln Total amount of salaries and bonuses paid to executive
X3 ln Total amount of compensation paid to executive
X4 ln Total compensation paid to CEO and equivalent
X5 ln Pension expense: the amount reported in the income statement related to a company's pension plan.
Dependent Variables:
Price to Book Ratio
EBITDA Margin

The above regression results describe the relationship between the human capital proxies and firm performance. The significances for the regressions of independent variables (‘number of employee’, and ‘total amount of salaries and bonuses paid to executive’) to the dependent variable ‘EBITDA Margin’ are smaller than 0.05, which indicate that these independent variables are significantly related to the dependent variable. However, the variables of ‘Number of employee’ and ‘Total amount of salaries and bonuses paid to executive’ correspond to negative coefficients and indicate negative correlations to the dependent variable. For example, the higher the ‘number of employees’ is, the smaller the value of EBITDA Margin. These findings seem to contradict with

the conclusions made by Tokarczyk et al, 2007 and Shaw et al, 2013, where they show that increases in human capital can bring firms' longevity, greater long-term business success and attenuate the negative effects on organizational performance caused by turnover. It is worth noting that during the crisis years, increasing the salary or other kinds of welfare and benefits will directly increase firm costs and may cause a decrease in the company's profitability margins.

Moreover, as can be observed, there is no correlation between 'Total compensation paid to CEO and equivalent' and 'EBITDA Margin'. This phenomenon can be explained by agency theory and transaction costs theory which suggest potential conflicts of interests between owners and managers, where the CEO may violate the contract in order to pursue their own interests. When managers are the owners of the organizations, they appropriate residual gains, they will work hard for both themselves and firm success, so there are no agency problems. However, managers in these top 50 most attractive companies are not owners and are attracted by incentive stock-based compensation. Even though the resource-based theory indicates that human capital is related to firm competitive advantage, the result indicates that a higher number of employees will lead to lower firm performance. Thus, maintaining an adequate number of employees is necessary for achieving organizational success.

In order to exam these results, the above regression model was decomposed into the following models:

Model 1:

	Price to Book Ratio				EBITDA Margin			
	B	t	Sig.	VIF	B	t	Sig.	VIF
X1	.502	.174	.864	1.108	-7.412	-1.875	.078	1.017
X2	-1.415	-.704	.489	1.102	-4.957	-1.801	.089	1.124
X3	-.713	-.504	.619	1.106	4.185	2.465	.025	1.061
X4	-1.375	-.880	.389	1.086	.170	.085	.933	1.063
Constant	38.502	.745	.465		115.434	1.813	.088	
N	25				22			
R Square	.092				.418			

Notes:
Independent variables:
X1 ln Number of employee
X2 ln Total amount of salaries and bonuses paid to executive (short run)
X3 ln Total amount of compensation paid to executive (long run)

X4 ln Pension expense: the amount reported in the income statement related to a company's pension plan.
Dependent Variables:
Price to Book Ratio
EBITDA Margin

Model 2:

	Price to Book Ratio				EBITDA Margin			
	B	t	Sig.	VIF	B	t	Sig.	VIF
X1	.700	.249	.806	1.088	-7.428	-1.810	.085	1.054
X2	-1.684	-.884	.386	1.025	-2.941	-1.059	.302	1.117
X3	-1.394	-.909	.374	1.085	.132	.061	.952	1.105
Constant	28.250	.605	.552		155.449	2.649	.015	
N			25				24	
R Square			.081				.214	

Notes:
Independent variables:
X1 ln Number of employee
X2 ln Total amount of salaries and bonuses paid to executive
X3 ln Pension expense: the amount reported in the income statement related to a company's pension plan.
Dependent Variables:
Price to Book Ratio
EBITDA Margin

Model 3:

	Price to Book Ratio				EBITDA Margin			
	B	t	Sig.	VIF	B	t	Sig.	VIF
X1	-3.652	-.893	.384	1.369	.236	.076	.941	1.201
X2	-2.148	-.879	.392	1.133	-1.674	-.795	.437	1.118
X3	-.950	-.294	.773	3.284	-.354	-.156	.878	2.106
ln(Assets)	-.167	-.040	.969	4.207	-.973	-.516	.612	2.439
Service	-.467	-.041	.967	1.551	2.612	.420	.680	2.536
Country	11.814	2.991	.008	1.188	-1.944	-.565	.579	1.161
Constant	99.508	1.760	.096		39.732	.766	.453	
N			25				24	
R Square			.115				.490	

Notes:
Independent variables:
X1 ln Number of employee
X2 ln Total amount of salaries and bonuses paid to executive
X3 ln Pension expense: the amount reported in the income statement related to a company's pension plan.
Dependent Variables:
Price to Book Ratio
EBITDA Margin

Model 1 shows that 'number of employees', 'total amount of salaries and bonuses paid to executive' and 'total amount of compensation paid to executive' are statistically significant to 'EBITDA margin'. The regression coefficients indicate that the EBITDA firm performance is negatively correlated to the payment to executive in the short term but it is positively related with firm performance in the long run. Moreover, both Model 1 and Model 2 show that 'number of employees' is negatively correlated with 'EBITDA margin' which is consistent with the previous conclusions. However, when the control variables (ln (Assets), Service, and Country) are added, there is no variable correlated with firm performance, which means that these control variables also play an important role in firm performance.

Sumedrea (2013) conclude that human capability (knowledge, skills and experience) plays an important role in firm performance growth during the crisis years. In order to investigate and validate whether this result is valid in the top 50 companies investigated in this study, we built another Panel data regression model, which includes the human capital variables of 'Employee training cost', 'Training spending per employee' and 'Number of employees'. Results are shown in Table 18.

Table 18 Panel data regression results of human capital variables and firm performance (2008-2010)

	Price to Book Ratio				EBITDA Margin			
	B	Robust Std. Err.	z	P>|z|	B	Robust Std. Err.	z	P>|z|
X1	0.021	0.050	0.420	0.671	-0.090	0.216	-0.420	0.677
X2	1.570	0.441	3.560	0.000	-2.339	3.141	-0.740	-0.420
X3	1.594	0.697	-2.290	0.022	0.994	4.246	0.230	0.456
ln(Assets)	-1.170	0.206	-5.680	0.000	-0.615	3.030	-0.200	0.815
Service	3.566	0.937	3.810	0.000	9.842	7.229	1.360	0.839
Country	1.737	0.900	1.930	0.054	16.222	3.074	5.280	0.173
Constant	18.137	2.635	6.880	0.000	24.060	34.600	0.700	0.000
Number of observations		25			22			
Number of groups		11			10			
R-sq		within = 0.0069 between = 0.8292 overall = 0.7986				within = 0.0160 between = 0.6783 overall = 0.5319		
Prob > chi2		0.000			0.000			
rho		0.4782			0.8526			
Note:								

Independent Variables
X1 Number of employees
X2 Employee training cost: Amount the company spent on employee training during the reporting period.
X3 Training spending per employee: an indicator that measures a company's commitment to enhancing their employees' competencies.
Dependent variables:
Price to Book Ratio
EBITDA Margin

As shown in Table 18, the 'employee training costs' and 'training spending per employee' are positively and significantly ($P<0.05$) related to "price to book ratio" during the crisis years, which may suggest that investment in training during the financial crisis period is critical for better firm performance. Therefore, a wise decision for a firm, during the crisis years, is to increase training cost to improve employee work ability rather than increase payment to motivate them to work harder. Similar results were obtained from the regression using the data for the year 2008 and 2009, respectively.

4.7 Will companies reward employees when better firm performance is achieved during economic crisis years?

The question of whether better firm performance will lead to higher employee income (including salaries, pension, other benefits, et al.) has long been a chicken-egg problem. Numerous researchers and executives concluded that companies should give bonus to inspire employees in order to have better firm performance. (Mullich, 2004; Guo et al. 2006; Indjejikian, et al., 2002); while others conclude that bonus given to employees should be based on their work performance or company's profitability (Xia et al., 2015; Gerena-Morales, 2004; Miller,1995). The former proposal has been examined in section 4.6, which concludes that during special years, increasing employee training instead of bonus may be the best choice for a company. In this section, we examined the latter proposal that whether companies will reward employees when better firm performance is achieved during economic crisis years.

The data for the year 2010 is used as a representative sample for this evaluation. In this analysis, the independent variables are firm performance proxies, and the dependent variables are human capital proxies. Results are displayed in Table 19.

Table 19 OLS regression results of the effect of firm performance on human capital variables (2010)

	X1		X2		X3		X4		X5	
	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.
PBR	.004	.812	-.020	.337	-.028	.383	-.065	.500	-.032	.318
EBITDA	-.025	.016	-.020	.087	.043	.020	-.009	.871	.001	.947
Constant	12.354	.000	16.300	.000	16.400	.000	16.066	.000	6.045	.000
N	32		29		30		20		23	
R Square	.185		0.160		.188		.022		.050	

Notes:
Dependent variables:
X1 ln Number of employee
X2 ln Total amount of salaries and bonuses paid to executives
X3 ln Total amount of compensation paid to executives
X4 ln Total compensation paid to CEO and equivalent
X5 ln Pension expense: the amount reported in the income statement related to a company's pension plan.
Independent Variables:
PBR: Price to Book Ratio
EBITDA Margin

As is shown in Table 19, the independent variable 'Price to Book Ratio' has no impact on any of the five human capital variables, only the 'EBITDA Margin' has the regression significance $P<0.1$ to some dependent variables, such as: 'number of employee (X1)' , and 'total amount of compensation paid to executive (X3)'. The negative regression coefficients indicate that the higher of the 'EBITDA Margin' the less of 'number of employee' and 'Total amount of compensation paid to executives'. In contrast to the chicken-egg problem, which predicts a positive correlation between human capital and firm performance, the resulted negative correlation shows that during the special years of the recent financial crisis, the commonly used employee incentive-based compensation methods may no longer be effective in the short run. Firm performance may be governed by outside critical market environment factors. As concluded in the previous section, some companies may choose to lay off employees or reduce bonus in order to save costs and manage the financial crisis.

However, the regression coefficient shows that 'Total amount of compensation paid to executives' is positively related to firm performance in the long run, which indicates that employee incentive compensation method is still effective to improve firm performance in the long run.

5. Conclusion and Discussion

This study sought to address the shortage of research on the relationships between human capital, firm performance, human capital disclosures, and Universum best employer ranking.

The first hypothesis according to which the degree of disclosure (financial and non-financial) of human capital information in the annual and CSR reports has a positive correlation with the Universum ranking' was tested. The correlation results indicate that the Universum rank of a company has a weak relationship with the human capital information disclosed. One possible explanation is that people rank the company they would like to work for not only based on the human capital information disclosed in the issued reports, but also on some other approaches such as advertisements, recruitment fairs, or other persons' recommendation. These approaches also provide direct and targeted information such as benefits, welfare and compensation and future career development sought after by employees.

The second issue about whether there exists a positive correlation between human capital variables and human capital disclosure scores was examined by conducting logistic regressions and OLS linear regression methods. Results indicate that the issue of 'whether the higher the employee benefits and welfare the more human capital information will be disclosed in the annual report and CSR report' is a controversial topic. This conclusion also indicates that the human capital information disclosed in the above reports may not be based on the value of human capital and it may simply be based on companies' internal or external rules since companies can voluntarily disclose human capital information.

The third issue regarding the hypothesis of whether a higher degree of disclosure of financial and non-financial human resource information are related with better firm performance was tested using panel data and OLS linear regressions with lagged data. Results show that there are no correlations between the dependent variables ('price to book ratio' and 'EBITDA margin') and independent variables (total scores, total sentences and total percentage of disclosure) which indicate that the human capital information disclosed in previous years has no effect on the firm performance of the future years, during economic crisis years. However, Gamerschlag (2013)

considered that human capital information is value-relevant but it cannot lead to short-term changes in market value, so whether the human capital disclosure in 2008 will have some effects on firm performance years after 2010 will need further exploration. The reverse question that whether better firm performance lead to higher degree of human capital disclosure is also examined. Results show the same conclusion that there is no correlation between them. It further validated the results that the HC information disclosed by a company either based on its internal regulations or external disclosure rules and is not effected by the other factors such as human capital or firm performance.

The fourth research question aimed at the validation of 'whether higher human capital proxies have a positive correlation with firm performance during the economic crisis years'. Results show that only the 'employee training costs' and 'training spending per employee' are positively and significantly related to 'price to book ratio' during the crisis years, which indicates that investment in training during the financial crisis period is critical for better firm performance. Better employee training can help firms build appropriate environmental attitudes, so staff training is more likely to have a positive and direct impact on the company's sustainability performance (Munoz Castellanos & Salinero Martín, 2011; Ji et al, 2012). However, even though training can help firms to gain competitive advantage because the inimitability of human capital, according to resource-based theory, firm specific capital can also cause a potential danger if these inimitable human capital move to rival firms. Therefore, using appropriate HR management strategies and corporate policies to retain employees are vital for training to have a positive effect on firm performance. Another finding of this analysis is that some of the human capital variables, such as: 'Number of employees' and 'Total salaries and bonuses paid to executives' are not positively but negatively correlated to the 'EBITDA Margin' whereas 'Total amount of compensation paid to executive' is positively related to firm performance. Therefore, during the economic crisis years, increasing the salary or other kinds of welfare and benefits do not lead to better performance in the short term. Based on the value-perception theory, pay is the least effective way to motivate employees (Locke et al, 1980). A suggestion is made that during the crisis years, increasing training costs to improve employees' work abilities rather than increase payments or rewards to motivate them to work harder may be a better HR management strategy.

The last research question examines whether companies reward employees when better firm performance is achieved during economic crisis years. In contrast to the conclusions made by previous researchers, such as Lewellen et al (1992), who concluded a positive correlation between human capital and firm performance, our negative correlation indicates that the commonly used employee performance-based management methods may no longer be effective during the special years. The higher payments to employees will directly increase the company's costs. Saving costs is important for companies especially during the crisis years, this also explained why some companies chose to lay off employees or reduce bonus in order to tide over the financial crisis storm. The above hypotheses and test results are summarized in Table 20 below.

Table 20 Hypotheses and test results

	Hypotheses	Results
H1	Higher human capital information disclosure in the issued reports is positively related to a higher ranking in the Universe's list of the world's top 50 employers	Results indicate no relationship between Universum rank and human capital disclosure scores with one weak correlation between business list ranking and HC disclosure sentences.
H2	There is a positive correlation between human capital disclosure scores and human capital variables (or proxies)	Results indicate weak relationship between human capital disclosure scores and human capital variables
H3a	Higher degree of disclosure of financial and non-financial human resource information is positively related with a better firm performance	Rejected. Results indicate no relationship between human capital disclosure scores and firm performance
H3b (reverse)	Better firm performance leads to a higher degree of human capital disclosure	Rejected. Results indicate no relationship between firm performance and human capital disclosure scores

H4a	Higher human capital leads to better firm performance during economic crisis years	'Training cost' and 'Training spending per employee' are positively associated with 'price to book ratio', whereas 'number of employee' and 'total amount of salaries and bonuses paid to executive' are negatively related to 'EBITDA margin' and 'Total amount of compensation paid to executive' is positively related to firm performance.
H4b(reverse)	Better firm performance leads to higher rewards for employees	Firm performance is negatively related to 'number of employees' and 'total amount of salaries and bonuses paid to executives' and 'total amount of compensation paid to executive' is positively correlated with "EBITDA margin".

6 Implications and Limitations

6.1 Implications

There are at least four implications related to this study's findings:

1) This study explored the importance of human capital (HC) disclosure in the issued reports (annual reports, CSR reports, and other related reports) on company's Universum rank, and firm performance. Our results indicate that companies may not need to pay attention to the HC information disclosed in its issued reports, since the information disclosed in the issued reports has little effect on company's Universum rank and firm performance.

2) Stakeholders and investors can rely partly on human resource disclosure to check the integrity and reliability of human capital information disclosed in the annual reports and CSR reports. The analysis results of the relationship between HC disclosure and human capital variables show that the HC information disclosed in the issued reports may simply be based on companies' internal or external rules since there is no correlation between HC disclosures and human capital variables. Therefore, stakeholders may not be able to get enough valid HC information from the issued public reports.

3) This paper can help HR managers to measure, manage, and report on human capital. Moreover, the results of this thesis can help them to focus on some significant human capital variables related to firm performance in order to create an appropriate compensation package. The results of the research question according to which higher human capital leads to better firm performance during the economic crisis years show that 'employee training costs' and 'training spending per employee' are positively related to "price to book ratio". A suggestion for firms is that investments in training during the financial crisis period is critical for better firm performance. Moreover, the variables of 'Number of employees' and 'Total amount of salaries and bonuses paid to executive' are negatively related to 'EBITDA Margin', which indicate that the incentive-based compensation methods utilized to provide incentives for employees to have a better work performance may no longer be effective in the short run. Therefore, a wise decision for HR managers would be to increase training costs to improve employee work abilities rather than increase payments to motivate them to work harder.

4) The final research target of this study is to analyze whether companies will reward employees when better firm performance is achieved during the economic crisis years. Our results show that there is no evidence to support this hypothesis. The negative correlation between firm performance and 'Number of employees' and 'Total amount of salaries and bonuses paid to executives' explains exactly why company chose to downsize their workforce or reduce bonus during the economic crisis years.

6.2 Limitations

The main limitations of this study are discussed below:

1) Firms have little variance since this paper only takes the samples from Universum's list of the best top 50 employers/companies. The correlation coefficients between dependent variables and independent variables may be smaller than the actual coefficients. The sample size may not be big enough to capture and validate the relationship between the human capital disclosure index and firm performance for other small companies. In the future, matching the sample of firms in the "best employers" lists and other comparable

companies (not on the list) could be used to provide more validity to the results of this thesis.

2) Three years' data may not be long enough to capture the differences and see the effects since the disclosure of human capital in 2008 may have some lagged effects on firm performance in 2013. Furthermore, human capital is a durable asset and a longer time period is needed to investigate the impacts of its investments and accumulation such as training and development. Future explorations of human capital disclosure and management effects on firm performance are needed.

3) Because some companies didn't provide precise and transparent information on human capital, the information related to internal resources (e.g., intrinsic values of HC such as salaries and stock bonuses to managers, contracts, task characteristics, and trust between employees and employers etc.) may not be sufficient. Therefore, some other methods to measure human capital information may be needed, such as combining telephone and online surveys or managing an interview.

4) The related content analysis methodology may cause some biases in our results because annual and CSR reports may not be able to show the true human capital information and actual investments in HC in the organization. Companies may have their internal regulations or external rules for disclosing HC information, so to capture the micro-level aspects of HC formations and investments as sources of competitive advantage, combining content analysis with other research methods is suggested for further research in this area.

Future research should focus on exposing other mediating factors, which can influence the relationship between HR practice and firm performance (Collins & Clark, 2003) and checking whether the economic financial crisis will influence the relationship between human capital variables and firm performance using data in other years and periods.

Appendix

Table 21. World's Most Attractive Employers (Sources from Universumglobal.com)

Business-Rank Employer Trend (2010)			Engineering-Rank Employer Trend (2010)	
1	Google		1	Google
2	KPMG		2	Microsoft
3	Ernst & Young		3	IBM
4	PricewaterhouseCoopers		4	Sony
5	Deloitte		5	BMW
6	Procter & Gamble		6	Intel
7	Microsoft		7	General Electric
8	The Coca-Cola Company		8	Siemens
9	J.P. Morgan		9	Procter & Gamble
10	Goldman Sachs		10	Apple
11	L'Oréal		11	Cisco Systems
12	BMW		12	Johnson & Johnson
13	Sony		13	Hewlett-Packard
14	Johnson & Johnson		14	Shell
15	The Boston Consulting Group		15	The Coca-Cola Company
16	McKinsey & Company		16	Esso/ExxonMobil
17	Morgan Stanley		17	Volkswagen
18	Apple		18	Toyota Motor
19	IBM		19	Nestlé
20	Deutsche Bank		20	Ford Motor Company
21	Nestlé		21	3M
22	Bank of America / Merrill Lynch		22	Dell
23	IKEA		23	General Motors
24	adidas		24	Accenture
25	Accenture		25	Philips
26	Unilever		26	McKinsey & Company
27	General Electric		27	Nokia
28	PepsiCo		28	BP
29	Citi		29	L'Oreal
30	UBS		30	Schlumberger
31	Credit Suisse		31	Oracle
32	Kraft Foods		32	Pfizer
33	Bain & Company		33	Bosch

34	Heineken		34	Goldman Sachs
35	American Express		35	IKEA
36	Barclays		36	The Boston Consulting Group
37	Hewlett-Packard		37	DuPont
38	Volkswagen		38	Kraft Foods
39	LVMH		39	Bayer
40	Shell		40	Deloitte
41	Toyota Motor		41	J.P. Morgan
42	Nokia		42	Unilever
43	Esso/ExxonMobil		43	Adidas
44	Intel		44	Lenovo
45	Dell		45	BASF
46	Pfizer		46	Novartis
47	Ford Motor Company		47	GlaxoSmithKline
48	Cisco Systems		48	Heineken
49	ING Group		49	Ernst & Young
50	General Motors		50	Morgan Stanley

Table 22 Independent sample test & nonparametric tests for total HC scores

Parameter	Independent Samples Test (Test the mean)						Nonparametric Tests					
							Test the Distribution			Test the Median		
	2008 VS 2009		2009 VS 2010		2008 VS 2010		2008 VS 2009	2009 VS 2010	2008 VS 2010	2008 VS 2009	2009 VS 2010	2008 VS 2010
	t	Sig.	t	Sig.	t	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.
TPD	0.94	0.35	-0.23	0.82	0.69	0.49	0.35	0.98	0.39	0.83	0.67	0.67
TSt	0.68	0.50	-0.36	0.72	0.31	0.76	0.24	0.61	0.41	0.67	0.67	0.67
TS	1.04	0.30	-0.02	0.98	1.03	0.31	0.29	0.88	0.18	1.00	0.20	0.20

Notes:
TPD is the total percentage of disclosure defined as the total numbers of subcategories that are disclosed in the reports divided by the total numbers of subcategories, this variable includes total financial percentage of disclosure as well as total non-financial percentage of disclosure.
TSt is the total numbers of sentences counted by reviewing annual reports, CSR reports and other relevant reports including qualitative information sentences (Financial &Nonfinancial) & total quantitative information sentences (Financial &Non-financial).
TS is the total score defined as the sum of all the subcategories' qualitative scores (Financial &Nonfinancial) and quantitative scores (Financial &Nonfinancial). Qualitative score: if this category is described in a qualitative manner the subcategory gets 1 score. Quantitative score: if a subcategory is described in a quantitative manner, it gets a score of 2 .

Table 23 Independent sample test & nonparametric tests for financial & non-financial HC scores

Parameter		Independent Samples Test (Test the mean)						Nonparametric Tests					
								Test the Distribution			Test the Median		
		2008 VS 2009		2009 VS 2010		2008 VS 2010		2008 VS 2009	2009 VS 2010	2008 VS 2010	2008 VS 2009	2009 VS 2010	2008 VS 2010
		t	Sig.	t	Sig.	t	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.
F	PD	0.67	0.51	0.04	0.97	0.71	0.48	0.31	0.92	0.44	0.39	0.52	1.00

	TSt	0.60	0.55	0.25	0.81	0.89	0.37	0.43	0.85	0.37	0.52	0.83	0.52
	TS	0.91	0.37	0.23	0.82	1.18	0.24	0.29	0.90	0.24	0.52	0.83	0.52
	PD	0.94	0.35	-0.54	0.59	0.35	0.73	0.45	0.74	0.75	0.39	1.00	0.67
NF	TSt	0.54	0.59	-1.27	0.21	-0.83	0.41	0.34	0.80	0.53	0.83	0.83	0.83
	TS	0.74	0.46	-0.48	0.64	0.24	0.81	0.39	0.90	0.50	0.83	1.00	0.67

Notes :
F : financial
NF : non-financial
PD: Percentage of Disclosure, calculated by numbers of subcategories disclosed in the reports in the financial or non-financial part of coding tables divided by the total number of subcategories in the financial or non-financial parts of the coding table.
TSt : Total Sentences = total qualitative information sentences+ total quantitative sentences
TS: Total scores= the sum of all the subcategories' qualitative scores (Financial &Nonfinancial) and quantitative scores (Financial &Nonfinancial).
Sig. is two tailed

Table 24. The correlation table of selected human capital variables

		X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	X17	X18	X19	X20
X1		1																			
	Sig.																				
X2		.992	1																		
	Sig.	.000																			
X3		.806	.752	1																	
	Sig.	.000	.000																		
X4		.488	.572	.104	1																
	Sig.	.065	.026	.535																	
X5		.348	.383	.359	.873	1															
	Sig.	.223	.159	.061	.000																
X6		.511	.550	-.014	.192	.058	1														
	Sig.	.062	.041	.933	.269	.782															
X7		.532	.602	.002	.220	.013	.845	1													
	Sig.	.219	.153	.992	.313	.961	.000														
X8		.471	.553	-.099	.185	-.050	.949	.822	1												

	Sig.	.122	.077	.582	.303	.822	.000	.000													
X9		.460	.480	.352	.355	.386	-.339	-.518	-.379	1											
	Sig.	.084	.070	.033	.031	.043	.050	.011	.032												
X10		.408	.424	.303	.055	.151	-.126	-.462	-.124	.890	1										
	Sig.	.148	.131	.072	.760	.482	.464	.020	.498	.000											
X11		.288	.313	.282	.010	.245	.379	-.050	.333	.263	.901	1									
	Sig.	.339	.321	.124	.958	.271	.035	.826	.072	.152	.000										
X12		.841	.894	.565	.212	.201	.793	.899	.812	.143	.703	.707	1								
	Sig.	.036	.016	.009	.399	.554	.000	.000	.000	.571	.001	.001									
X13		-.007	.010	.355	.287	.472	-.328	-.516	-.349	.922	.774	.279	-.214	1							
	Sig.	.979	.970	.024	.085	.011	.048	.008	.050	.000	.000	.129	.364								
X14		.552	.561	.544	.216	.292	-.102	-.106	-.092	.441	.453	.404	.594	.418	1						
	Sig.	.022	.019	.000	.206	.147	.548	.622	.616	.008	.006	.027	.007	.009							
X15		.704	.691	.666	.121	.285	.131	.303	.062	.381	.338	.222	.592	.332	.577	1					
	Sig.	.002	.002	.000	.526	.198	.491	.222	.764	.041	.079	.287	.012	.068	.000						
X16		.369	.298	.294	.048	.239	.057	-.019	.020	.233	.116	-.080	.198	.280	.304	.804	1				
	Sig.	.160	.262	.096	.800	.296	.766	.940	.922	.225	.558	.704	.447	.127	.080	.000					
X17		.139	.116	.135	-.035	.015	-.115	-.250	-.119	.261	.096	-.008	-.045	.432	.318	.849	.789	1			
	Sig.	.607	.668	.461	.855	.950	.551	.332	.572	.180	.635	.972	.869	.017	.071	.000	.000				
X18		.573	.580	.457	.169	.287	.059	.303	-.017	.433	.260	.125	.477	.350	.827	.896	.761	.787	1		
	Sig.	.032	.023	.009	.382	.208	.761	.222	.935	.021	.191	.562	.053	.058	.000	.000	.000	.000			
X19		.135	.053	.169	.076	.015	-.249	-.237	-.232	.472	-.133	-.180	-.031	.608	.410	.848	.792	.999	.788	1	
	Sig.	.632	.846	.346	.686	.946	.193	.360	.255	.008	.509	.389	.909	.000	.018	.000	.000	.000	.000		
X20		.473	.442	.605	-.059	.046	.159	-.167	-.005	.190	.274	.092	.126	.464	.622	.900	.760	.752	.908	.752	1
	Sig.	.103	.131	.000	.767	.853	.439	.552	.981	.343	.195	.685	.654	.013	.000	.000	.000	.000	.000	.000	

Note:

X1 XLR: the amount of money it pays to all of its direct labor employees over a specific period.

X2 Personnel expense: Includes wages and salaries, social security, pension, profit-sharing expenses and other benefits related to personnel.

X3 Number of employees

X4 Total amount of salaries and bonuses paid to executive

X5 Total amount of bonuses the company paid to the executives

X6 Total amount of compensation paid to executive

X7 Total amount of stock awards paid to executive

X8 All other compensation paid to executive

X9 Total amount of salaries and bonuses paid to CEO

X10 Total compensation paid to CEO and equivalent

X11 All other compensation paid to CEO and equivalent

X12 Total stock awards given to CEO and equivalent
X13 Total salaries paid to CEO and equivalent
X14 Pension postretirement expense (data from Compustat).
X15 Pension plans service cost: The present value of the projected retirement benefits earned by plan participants in the current period (data from Compustat).
X16 Pension benefits paid: Pension benefits paid (data from Compustat).
X17 Pension employer contribution: The fraction of a pension plan's cost paid by the employer (data from Compustat).
X18 Pension expense: the amount reported in the income statement related to a company's pension plan (data from Bloomberg).
X19 Employee contribution: a company-sponsored retirement plan where employees may elect to have a portion of each paycheck deposited into a retirement account owned by the employee and held in his or her name (data from Bloomberg).
X20 Pension obligation: an actuarial liability equal to the present value of liabilities earned and the present value of liability from future compensation increases (data from Bloomberg).

Table 25 The logistic regression results of the year of 2008

	Total score		Total sentences		Total percentage of disclosure	
	B	Sig.	B	Sig.	B	Sig.
X1	-1.911	.173	.474	.868	-2.842	.104
X2	-.813	.470	-.139	.916	.995	.402
X3	.470	.625	6.453	.309	-.209	.817
X4	.046	.961	-5.634	.344	.835	.367
X5	1.586	.079	-.037	.973	2.229	.077
constant	3.987	.817	-18.892	.515	-24.880	.211

Notes:
X1 ln Number of employee
X2 ln Total amount of salaries and bonuses paid to executive
X3 ln Total amount of compensation paid to executive
X4 ln Total compensation paid to CEO and equivalent
X5 ln Pension expense: the amount reported in the income statement related to a company's pension plan.

Table 26 The logistic regression results of the year of 2009

	Total score		Total sentences		Total percentage of disclosure	
	B	Sig.	B	Sig.	B	Sig.
X1	.709	.530	.796	.538	1.283	.211
X2	-.449	.696	-1.913	.223	.331	.714
X3	.043	.971	1.035	.527	-.057	.949
X4	-2.278	.200	-4.262	.166	-.919	.278
X5	.228	.747	-.034	.966	.479	.462
constant	33.926	.325	73.669	.161	-7.122	.706

Notes:
X1 ln Number of employee
X2 ln Total amount of salaries and bonuses paid to executive
X3 ln Total amount of compensation paid to executive
X4 ln Total compensation paid to CEO and equivalent
X5 ln Pension expense: the amount reported in the income statement related to a company's pension plan.

Table 27 Regression results disclosure scores and firm performance (2009)

A. OLS regression results for lag independents 2008 total scores VS 2009 firm performance

	Price to Book				EBITDA Margin			
	B	t	Sig.	VIF	B	t	Sig.	VIF
Log(TS)	2.366	2.154	.037	1.275	7.289	1.312	.197	1.275
ln(Assets)	-.414	-2.346	.024	1.393	-2.048	-2.293	.027	1.393
Service	.503	.643	.524	1.134	-4.383	-1.109	.274	1.134

Country	.975	1.456	.153	1.029	11.991	3.540	.001	1.029
Constant	3.750	1.940	.060		26.322	2.693	.010	

B. OLS regression results for lag independents 2008 total sentences VS 2009 firm performance

	Price to Book				EBITDA Margin			
	B	t	Sig.	VIF	B	t	Sig.	VIF
Log(TSt)	1.578	2.126	.040	1.241	2.421	.635	.529	1.241
ln(Assets)	-.411	-2.327	.025	1.387	-1.796	-1.983	.054	1.387
Service	.512	.654	.517	1.134	-4.307	-1.071	.291	1.134
Country	.724	1.082	.286	1.024	11.378	3.313	.002	1.024
Constant	4.128	2.165	.037		28.251	2.886	.006	

C. OLS regression results for lag independents 2008 total percentage of disclosure VS 2009 firm performance

	Price to Book				EBITDA Margin			
	B	t	Sig.	VIF	B	t	Sig.	VIF
Log(TPD)	1.886	1.741	.090	1.441	6.693	1.242	.222	.694
ln(Assets)	-.437	-2.253	.030	1.618	-2.203	-2.284	.028	.618
Service	.651	.815	.420	1.140	-3.876	-.975	.335	.877
Country	.855	1.258	.216	1.019	11.633	3.444	.001	.981
Constant	3.967	2.021	.050		26.683	2.734	.009	

Table 28 Regression results disclosure scores and firm performance (2010)

A. OLS regression results for lag independents 2009 total scores VS 2010 firm performance

	Price to Book				EBITDA Margin			
	B	t	Sig.	VIF	B	t	Sig.	VIF
Log(TS)	-1.357	-.554	.583	1.183	.075	.015	.988	1.183
ln(Assets)	-.282	-.616	.541	1.273	-1.161	-1.268	.212	1.273
Service	1.147	.550	.585	1.120	-6.263	-1.504	.141	1.120
Country	-.676	-.377	.708	1.026	11.447	3.194	.003	1.026
Constant	6.479	1.262	.214		26.056	2.540	.015	

B.OLS regression results for lag independents 2009 total sentences VS 2010 firm performance

	Price to Book				EBITDA Margin			
	B	t	Sig.	VIF	B	t	Sig.	VIF
Log(TSt)	-.711	-.370	.714	1.211	-1.124	-.293	.771	1.211
ln(Assets)	-.298	-.633	.531	1.343	-1.046	-1.113	.272	1.343
Service	1.086	.520	.606	1.118	-6.277	-1.510	.139	1.118
Country	-.550	-.308	.760	1.011	11.447	3.222	.003	1.011

Constant	6.215	1.218	.231	26.377	2.594	.013	

C.OLS regression results for lag independents 2009 total percentage of disclosure VS 2010 firm performance

	Price to Book				EBITDA Margin			
	B	t	Sig.	VIF	B	t	Sig.	VIF
Log(TPD)	-.127	-.047	.963	1.418	2.079	.384	.703	1.418
ln(Assets)	-.356	-.710	.482	1.517	-1.350	-1.354	.184	1.517
Service	1.095	.524	.603	1.118	-6.248	-1.504	.141	1.118
Country	-.564	-.313	.756	1.028	11.616	3.245	.002	1.028
Constant	6.071				25.367	2.468	.018	

Table 29 OLS Regression results disclosure scores and firm performance (2008)

A. Regression results for Price to Book, Log(TS) and Log(TSt)

	Log(TS)				Log(TSt)			
	B	t	Sig.	VIF	B	t	Sig.	VIF
Constant	-11.551	-0.53	0.599		-138.09	-1.374	0.179	
Price to Book	1.317	1.334	0.191	2.122	7.597	1.667	0.105	2.122
ln(Assets)	2.167	1.227	0.229	2.554	14.192	1.742	0.091	2.554
Service	-0.942	-0.217	0.829	1.584	-20.467	-1.023	0.314	1.584
Country	-1.917	-0.606	0.549	1.039	8.022	0.55	0.586	1.039

B. Regression results for Price to Book and Log(TPD)

	Log(TPD)			
	B	t	Sig.	VIF
Constant	-26.209	-0.644	0.524	
Price to Book	2.443	1.324	0.195	2.122
ln(Assets)	4.878	1.478	0.149	2.554
Service	-3.237	-0.399	0.692	1.584
Country	-4.526	-0.765	0.449	1.039

C. Regression results for EBITDA Margin, Log(TS) and Log(TSt)

	Log(TS)				Log(TSt)			
	B	t	Sig.	VIF	B	t	Sig.	VIF
Constant	23.373	1.175	0.249		24.278	1.243	0.224	
EBITDA Margin	0.037	0.223	0.825	1.026	-0.999	-0.579	0.567	1.124
ln(Assets)	-1.019	-0.591	0.559	1.122	10.991	2.219	0.034	1.142
Service	11.115	2.246	0.032	1.138	12.146	4.018	0	1.029
Country	12.18	3.989	0	1.048	-0.011	-0.326	0.746	1.016

D. Regression results for EBITDA Margin and Log(TPD)

	Log(TPD)			
	B	t	Sig.	VIF
Constant	24.413	1.229	0.228	
EBITDA Margin	-1.036	-0.6	0.553	1.12
ln(Assets)	11.075	2.233	0.033	1.141
Service	12.059	3.973	0	1.034
Country	-0.006	-0.066	0.948	1.015

Notes:
Log(TS)= log (total scores)
Log(TSt)= log (total sentences)
Log(TPD)= log (total percentage of disclosure)

Table 30 OLS Regression results disclosure scores and firm performance (2009)

A. Regression results for Price to Book, Log(TS) and Log(TSt)

	Log(TS)				Log(TSt)			
	B	t	Sig.	VIF	B	t	Sig.	VIF
Constant	8.321	0.353	0.726		-72.308	-0.652	0.519	
Price to Book	-0.344	-0.332	0.742	2.167	1.768	0.362	0.719	2.167
ln(Assets)	0.563	0.293	0.771	2.586	9.226	1.02	0.315	2.586
Service	0.324	0.072	0.943	1.577	-13.92	-0.658	0.515	1.577
Country	-0.094	-0.028	0.978	1.066	8.022	0.55	0.586	1.039

B. Regression results for Price to Book and Log(TPD)

	Log(TPD)			
	B	t	Sig.	VIF
Constant	9.702	0.226	0.822	
Price to Book	-0.039	-0.021	0.983	2.167
ln(Assets)	1.909	0.547	0.588	2.586
Service	0.679	0.083	0.934	1.577
Country	-4.526	-0.765	0.449	1.039

C. Regression results for EBITDA Margin, Log(TS) and Log(TSt)

	Log(TS)				Log(TSt)			
	B	t	Sig.	VIF	B	t	Sig.	VIF
Constant	12.479	0.534	0.598		15.037	0.136	0.892	
EBITDA Margin	-0.167	-0.79	0.436	2.155	-0.491	-0.493	0.626	2.155
ln(Assets)	0.363	0.18	0.859	1.159	2.605	0.274	0.786	1.159
Service	0.354	0.057	0.955	1.413	-12.934	-0.44	0.663	1.413
Country	1.021	0.229	0.82	1.744	12.505	0.595	0.556	1.744

D. Regression results for EBITDA Margin and Log(TPD)

	Log(TPD)			
	B	t	Sig.	VIF
Constant	21.159	0.491	0.627	
EBITDA Margin	-0.098	-0.252	0.803	2.155
ln(Assets)	1.144	0.308	0.761	1.159
Service	-1.377	-0.12	0.906	1.413
Country	-4.444	-0.541	0.593	1.744

Notes:
Log(TS)= log (total scores)
Log(TSt)= log (total sentences)
Log(TPD)= log (total percentage of disclosure)

Bibliography

Abbott, W. F., & Monsen, R. J. (1979). On the measurement of corporate social responsibility: Self-reported disclosures as a method of measuring corporate social involvement. *Academy of Management journal*, *22*(3), 501-515.

Alchian, A. A., & Demsetz, H. (1972). Production, information costs, and economic organization. *The American economic review*, 777-795.

Altman, E. I. (1983). Predicting corporate bankruptcy: The Z-Score model. *Corporate Financial Distress: A Complete Guide to Predicting, Avoiding and Dealing with Bankruptcy*.

Aragón-Correa, J. A., Marcus, A., & Hurtado-Torres, N. (2016). The Natural Environmental Strategies of International Firms: Old Controversies and New Evidence on Performance and Disclosure. *The Academy of Management Perspectives*, *30*(1), 24-39.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of management*, *17*(1), 99-120.

Baron, A. (2011). Measuring human capital. *Strategic HR Review*, *10*(2), 30-35.

Becker, G. S. (1962). Investment in human capital: A theoretical analysis. *The journal of political economy*, 9-49.

Becker, G. S. (1964). Human capital theory. *Columbia, New York*.

Bekiris, F. V. (2013). Ownership structure and board structure: are corporate governance mechanisms interrelated. *Corporate Governance: The international journal of business in society*, *13*(4), 352-364.

Burton-Jones, A., & Spender, J. C. (2011). *The Oxford handbook of human capital*. Oxford Handbooks Online.

Chelli, M., Durocher, S., & Richard, J. (2014). France's new economic regulations: insights from institutional legitimacy theory. *Accounting, Auditing & Accountability Journal*, *27*(2), 283-316fi

Cloyd, C. B., Pratt, J., & Stock, T. (1996). The use of financial accounting choice to support aggressive tax positions: Public and private firms. *Journal of Accounting research*, 23-43.

Coase, R. H. (1937). The nature of the firm. *economica*, *4*(16), 386-405.

Coff, R. W. (1997). Human assets and management dilemmas: Coping with hazards on the road to resource-based theory. *Academy of Management Review*, *22*(2), 374-402.

Collins, C. J., & Clark, K. D. (2003). Strategic human resource practices, top management team social networks, and firm performance: The role of human resource practices in creating organizational competitive advantage. *Academy of management Journal*, *46*(6), 740-751.

Crook, T. R., Todd, S. Y., Combs, J. G., Woehr, D. J., & Ketchen Jr, D. J. (2011). Does human capital matter? A meta-analysis of the relationship between human capital and firm performance. *Journal of applied psychology*,*96*(3), 443.

Davenport, T. H., Harris, J., & Shapiro, J. (2010). Competing on talent analytics. *Harvard Business Review*, *88*(10), 52-58.

Eisner, R. (1989). *The total incomes system of accounts*. University of Chicago Press.

Engel, E. (1883). *Der Werth des Menschen: Theil 1, der Kostenwerth des Menschen*. Leonhard Simion.

Fulmer, I. S., & Ployhart, R. E. (2013). "Our Most Important Asset" A Multidisciplinary/Multilevel Review of Human Capital Valuation for Research and Practice. *Journal of Management*, 0149206313511271.

Fulmer, I. S., Gerhart, B., & Scott, K. S. (2003). Are the 100 best better? An empirical investigation of the relationship between being a “great place to work” and firm performance. *Personnel Psychology*, *56*(4), 965-993.

Fulmer, I. S., Gerhart, B., & Scott, K. S. (2003). Are the 100 best better? An empirical investigation of the relationship between being a “great place to work” and firm performance. *Personnel Psychology*, *56*(4), 965-993.

Gamerschlag, R. (2013). Value relevance of human capital information. *Journal of Intellectual Capital*, *14*(2), 325-345.

Garavan, T. N., Morley, M., Gunnigle, P., & Collins, E. (2001). Human capital accumulation: the role of human resource development. *Journal of European Industrial Training*, *25*(2/3/4), 48-68.

Gerena-Morales, Rafael. (2004). More companies link executive rewards to results, experts say. *Knight Ridder Tribune Business News*, May 23, 2004, p1

Gompers, P. A., Ishii, J. L., & Metrick, A. (2001). *Corporate governance and equity prices* (No. w8449). National bureau of economic research.

Guo, W. C., Shiah-Hou, S. R., & Yang, Y. W. (2006). Stock bonus compensation and firm performance in Taiwan. *Managerial finance*, *32*(11), 862-885.

Guthrie, J., Petty, R., & Ricceri, F. (2006). The voluntary reporting of intellectual capital: Comparing evidence from Hong Kong and Australia. *Journal of Intellectual Capital*, *7*(2), 254-271.

Hackston, D., & Milne, M. J. (1996). Some determinants of social and environmental disclosures in New Zealand companies. *Accounting, Auditing & Accountability Journal*, *9*(1), 77-108.

He, J., & Wang, H. C. (2009). Innovative knowledge assets and economic performance: The asymmetric roles of incentives and monitoring. *Academy of Management Journal*, *52*(5), 919-938.

Huselid, M. A. (1995). The impact of human resource management practices on turnover, productivity, and corporate financial performance. *Academy of management journal*, *38*(3), 635-672.

Iles, P., Mabey, C., & Robertson, I. (1990). HRM practices and employee commitment: Possibilities, pitfalls and paradoxes. *British Journal of Management*, *1*(3), 147-157.

Indjejikian, Raffi J.; Nanda, Dhananjay; Indjejikian, R. J., & Nanda, D. (2002). Executive target bonuses and what they imply about performance standards. *The Accounting Review*, *77*(4), 793-819.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, *3*(4), 305-360.

Ji, L., Huang, J., Liu, Z., Zhu, H., & Cai, Z. (2012). The effects of employee training on the relationship between environmental attitude and firms' performance in sustainable development. *The International Journal of Human Resource Management*, *23*(14), 2995-3008.

Jung, K., Dalessio, A., & Johnson, S. 1986. Stability of the factor structure of the job descriptive index. *Academy of Management Journal,* 29: 609-616.

Kaufman, R., & Keller, J. M. (1994). Levels of evaluation: beyond Kirkpatrick.*Human Resource Development Quarterly*, *5*(4), 371-380.

Kendrick, J. W. (1976). The formation and stocks of total capital. *NBER Books*.

Lajili, K. (2012). Towards Building a Human-Capital Based Governance Framework. *Journal of Management Policy and Practice*, *13*(3), 13-30.

Lajili, K. (2015). Embedding human capital into governance design: a conceptual framework. *Journal of Management & Governance*, 1-22.

Lajili, K., & Zéghal, D. (2005). A content analysis of risk management disclosures in Canadian annual reports. *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration*, *22*(2), 125-142.

Lajili, K., & Zeghal, D. (2006). Market performance impacts of human capital disclosures. *Journal of Accounting and Public Policy*, *25*(2), 171-194.

Le, T., Gibson, J., & Oxley, L. (2003). Cost-and income-based measures of human capital. *Journal of economic surveys*, *17*(3), 271-307.

Leonard, J. S. (1990). Executive pay and firm performance. *Industrial & Labor Relations Review*, *43*(3), 13S-29S.

Lewellen, W., Loderer, C., Martin, K., & Blum, G. (1992). Executive Compensation and the Performance of the Firm. *Managerial and Decision Economics*, *13*(1), 65-74.

Liu, X., van Jaarsveld, D. D., Batt, R., & Frost, A. C. (2014). The Influence of Capital Structure on Strategic Human Capital Evidence from US and Canadian Firms. *Journal of Management*, *40*(2), 422-448.

Locke, E. A., Feren, D. B., McCaleb, V. M., Shaw, K. N., & Denny, A. T. (1980). The relative effectiveness of four methods of motivating employee performance. *Changes in working life*, *363*(1), 388.

Marimuthu, M., Arokiasamy, L., & Ismail, M. (2009). Human capital development and its impact on firm performance: Evidence from developmental economics. *The journal of international social research*, *2*(8), 265-272.

Miller, D. J. (1995). CEO salary increases may be rational after all: Referents and contracts in CEO pay. *Academy of Management journal*, *38*(5), 1361-1385.

Mullich, Joe. (2004). Giving employees something they can't buy with a bonus check. *Workforce management,* Vol, 83(7), pp. 66-68

Munoz Castellanos, R. M., & Salinero Martín, M. Y. (2011). Training as a source of competitive advantage: performance impact and the role of firm strategy, the Spanish case. *The International Journal of Human Resource Management*, *22*(03), 574-594.

Nordhaug, O. (1998). Competence specificities in organizations: a classificatory framework. *International Studies of Management & Organization*, *28*(1), 8-29.

Provo, J. (2000). Measuring human capital. *Advances in Developing Human Resources*, *2*(1), 76-90.

Remišová, A., & Búciová, Z. (2012). Measuring corporate social responsibility towards employees. *Journal for East European Management Studies*, 273-291.

Rice, R., Gentile, D., & McFarlin, D. 1991. Facet importance and job satisfaction. *Journal of Applied Psychology*, 76: 31-39.

Robertson, I. T., Iles, P. A., Gratton, L., & Sharpley, D. (1991). The psychological impact of selection procedures on candidates. *Human Relations*, *44*(9), 963-82.

Scarpello, V., & Campbell, J. P. 1983. Job satisfaction: Are all the parts there? *Personnel Psychology*, 36: 577-600.

Shaw, J. D., Park, T. Y., & Kim, E. (2013). A resource‐based perspective on human capital losses, HRM investments, and organizational performance. *Strategic management journal*, *34*(5), 572-589.

Simon, H. A. (1951). A formal theory of the employment relationship. *Econometrica: Journal of the Econometric Society*, 293-305.

Simon, H. A. (1978). Rationality as process and as product of thought. *The American economic review*, 1-16.

Smith, A. (1937). *An Inquiry into the Nature and Causes of the Wealth of Nations*. Рипол Классик.

Sumedrea, S. (2013). Intellectual capital and firm performance: a dynamic relationship in crisis time. *Procedia Economics and Finance*, *6*, 137-144.

Tokarczyk, J., Hansen, E., Green, M., & Down, J. (2007). A Resource ‐ Based View and Market Orientation Theory Examination of the Role of "Familiness" in Family Business Success. *Family Business Review*, *20*(1), 17-31.

Unger, J. M., Rauch, A., Frese, M., & Rosenbusch, N. (2011). Human capital and entrepreneurial success: A meta-analytical review. *Journal of Business Venturing*, *26*(3), 341-358.

Weiss, A. 1990. *Efficiency wages: Models of unemployment, layoffs, and wage dispersion*. Princeton, NJ: Princeton University Press.

Wickens, C. H. (1924) Human Capital, Report of the Sixteenth Meeting of the Australasian Association for the Advancement of Science (pp. 526–554).

Williamson, O. E. (1975). Markets and hierarchies. *New York*, 26-30.

Williamson, O. E. (1985). *The economic institutions of capitalism*. Simon and Schuster.

Wilson, M. A., Chacko, T. I., Shrader, C. B., & Mullen, E. (1992). Top executive pay and firm performance. *Journal of Business and Psychology*,*6*(4), 495-501.

Wiseman, J. (1982). An evaluation of environmental disclosures made in corporate annual reports. *Accounting, Organizations and Society*, *7*(1), 53-63.

Xia, Y., Zu, X., & Shi, C. (2015). A profit-driven approach to building a "people-responsible" supply chain. *European Journal of Operational Research*, *241*(2), 348-360.

Youndt, M. A., Snell, S. A., Dean, J. W., & Lepak, D. P. (1996). Human resource management, manufacturing strategy, and firm performance. *Academy of management Journal*, *39*(4), 836-866.

Zhou, W., Georgakopoulos, G., Sotiropoulos, I., & Vasileiou, K. Z. (2011). The impact of executive payment on firm performance of the financial enterprises in China. *Asian Social Science*, *7*(8), 65.