Improving the information environment for analysts

Which intellectual capital disclosures matter the most?

Farooq, Omar; Nielsen, Christian

Published in:
Journal of Intellectual Capital

DOI (link to publication from Publisher):
10.1108/JIC-12-2012-0109

Publication date:
2014

Document Version
Early version, also known as pre-print

Intellectual capital disclosure and analyst following: Evidence from Danish biotechnology firms

---

Authors

Omar Farooq and Christian Nielsen

Department of Business and Management, Aalborg University, Aalborg, Denmark

Fibigerstræde 4, 9220 Aalborg Ø., Denmark

E: chn@business.aau.dk

Abstract

Purpose: The purpose of this paper is to document the relationship between intellectual capital disclosure and analyst following for biotechnology firms listed at the Copenhagen Stock Exchange during the period between 2001 and 2010.

Design/methodology/approach: Intellectual capital disclosure was computed from financial statements, while analyst following data was retrieved from I/B/E/S.

Findings: The results show that analysts are more likely to follow firms with high intellectual capital disclosure. This finding is consistent with the fact that analysts wish to follow those firms for which they have more information. Our results also show that intellectual capital disclosure related to employees and strategic statements are the most important disclosures for analysts.

Research limitations/implications: More relevant methods, such as survey or interviews with management, may be used to improve the information content of intellectual capital disclosure. Analysts, probably, deduce intellectual capital of a firm from interaction with management rather than financial statements.

Practical implications: Firms in biotechnology sector can improve their information environment by disclosing more information regarding their intellectual capital in financial statements.

Originality/value: Our findings shed light on the importance of intellectual capital in biotechnology sector for analysts.

JEL Classification: G34

Keywords: Intellectual Capital Disclosure; Information Asymmetry; Analyst Following; Biotechnology Sector

1. Introduction

Throughout the entire period of the existence of the present journal, a vast amount of contributions pondering the information value of intellectual capital to external stakeholders such as e.g. financial analysts and investors have been offered. Although published in a competing journal, it is worth noting that Guthrie *et al.* (2012) accentuate this in a recently published review paper that relates back to an early overview article in the present journal. Intellectual capital lends itself naturally to studies of information asymmetry, because intellectual capital rests primarily on a managerial informativeness platform, while the stakeholders above generally do not have access to this information. Hence, several problems blossom in the communication of t information like intellectual capital, ranging from secrecy and sensitivity to complexity. In a seminal article on this issue, Holland & Johanson (2003) synthesize that capital market agents do not value intellectual capital because they do not know how to understand it. Somewhat provocatively, Holland & Johnson (2003) also suggest that this not surprising, taking the example that capital market participants typically do not understand even their own value creation proposition.

In line with these notions, a few contributions have pointed to problems of analyzing intellectual capital for decision-making purposes (cf. Nielsen *et al.* 2006). For example, Mouritsen *et al.* (2003) suggest a methodology for analyzing intellectual capital and use metaphors of analyzing the financial report to give suggestions for how to analyze intellectual capital, whereas Royal and O'Donnell (2008) focus on methods more specifically for enhancing the analysis of human capital. While studies of how to use intellectual capital information for analysis purposes are rare, there are a multitude of studies published on the information content of IPO prospectuses (Bukh *et al.* 2005, Singh & Mitchell Van der Zahn 2007, Rimmel, Nielsen & Yosano 2009) and the content of analyst reports (Flöstrand 2006, Nielsen 2008, Abhayawansa and Abejsekera 2009).

In much the same realm, there are also several studies addressing the information environment in which the companies and the analysts interact, for instance being reflected in the content of intellectual capital in for example annual reports (cf. Arvidsson 2011) or sustainability reports (Cinquini et al. 2012). Lastly there are also some studies that are industry-specific in relation to the present article. For instance, White, Lee and Tower (2007) study the intellectual capital disclosures of Australian biotechnology companies, while White *et al.* (2010), compose a

comparative study of the information disclosure of biotechnology companies in the UK and Australia respectively. While using the companies' disclosure levels as a proxy for information environment may be considered a normal practice, Nielsen & Madsen (2009) emphasize that it is important to remember that this may be problematic because corporate management may be attempting to portray their own message. The remainder of the paper is structured as follows: Section 2 briefly discusses arguments behind our hypothesis. Section 3 summarizes the data and Section 4 presents assessment of our hypothesis. Section 5 documents discussion on results and the paper ends with Section 6 where we present our conclusions.

2. Hypothesis development

Modern corporation has given rise to principal-agent relationship – also known as agency problems. This relationship is characterized by a situation, where managers may adopt a behaviour that serves their interests at the expense of shareholders. Agency problems provide means and incentives to managers to consume more perquisites than previously agreed (Fama, 1980). One of the ways to ensure that managers do not diverge from their task of serving shareholders is to provide as much information as possible. This information not only contains information about a firm's physical capital, but also about its intellectual capital. Prior literature considers information regarding intellectual capital to be as important as the information regarding physical capital. Sofian *et al.* (2011), for instance, point out that, on average, more than 30% of a firm's value is represented by its intellectual capital. The importance of intellectual capital is, further, enhanced in knowledge-intensive sectors (for example, IT and biotechnology) because intellectual capital typically outweighs physical capital in value in these sectors. Holland (2003) argues that intellectual capital is a pivotal component of in overall growth of knowledge-intensive firms and is a major source of their competitive advantage.

2.1 Intellectual capital disclosure and information asymmetries

Intellectual capital can be thought of as an information construct that provides value relevant information to outsiders about firm's long-term sustainability. Hayton (2005) argues that unique resources embedded in intellectual capital allows a firm to enter new markets, gain first

mover advantages, and create high quality products. All of these characteristics are of paramount importance for anyone who wants to make an informed trade of stocks. Prior literature argues that failure to disclose information regarding intellectual capital can give rise to agency problems by allowing insiders to take advantage at the expense of outsiders (Thompson and Randall, 2000). Given that traditional financial statements do not provide adequate information about intellectual capital, knowledge-intensive firms can become an easy target for expropriation by insiders. Henceforth, disclosure of intellectual capital can lead to substantial reduction in risk of expropriation by reducing information asymmetries (Arvidsson, 2011; Holland, 2006). We argue that disclosure of intellectual capital reduces the amount of private information relative to public information and results in lowering uncertainty of prospective benefits generated from uncapitalized intangible assets.

Consistent with the above arguments, prior literature notes that intellectual capital disclosure provides stock market participants with more value relevant information about firms (Williams, 2001, Beattie and Thomason, 2007) and Canibano *et al.* (1999) document that disclosure of intellectual capital helps in increasing value relevance of financial statements. Consequently, the stock market's understanding of a firm's overall value creating activities and risks associated with them improves. Hence, it makes stock prices more efficient, thereby allowing stock market participants to trust information revealed through prices. Therefore, intellectual capital disclosure also leads to reduction in stock price volatilities (Garcia-Ayuso, 2003).

In addition to what is stated above, intellectual capital disclosure can also reduce information asymmetries by creating trustworthiness with stakeholders (Meer-Kooistra and Zijlstra, 2001; Bornemann and Leitner, 2002). As a result, we should expect firms with high intellectual capital disclosure to have more loyal customers and employees. Prusak and Cohen (2001) note that establishment of trust is one of the most important channels via which firms can ensure stakeholders' commitment to a firm's future. Intellectual capital disclosure should, therefore, lead to lower uncertainty regarding future prospects of the firm.

2.2 Information asymmetries and analyst following

Analysts are specialized agents that gather, interpret, and disseminate information. In doing so, they track firms on a regular basis, continuously scrutinize management behavior, and unearth any accounting irregularities committed by firms. Oversight provided by analysts is, usually, more than the supervision provided by board members, regulators, and auditors. Board members, for instance, meet only few times a year, regulators only review a small fraction of financial reports, and auditors only visit at the end of the fiscal year for a short period. One of the reasons for this increased oversight provided by analysts is their constant need of value relevant information. High quality information is an essential constituent for accurate forecasts and recommendations.

In this paper, we argue that analysts are attracted towards firms that provide them with enough information to work with. Our conjecture is consistent with prior literature that documents lower analyst following for firms with high information asymmetries (Lang and Lundholm, 1996; Healy *et al.*, 1999). This strand of literature suggests that analysts are less likely to be attracted to firms with high information asymmetries due to their concern for reputation. Stickel (1992) suggests that more reputable analysts get higher compensation and are more likely to be promoted and less likely to be fired. In another related study, Hong and Kubik (2003) argue that being accurate is an important mechanism via which analysts build their reputation. They document that accurate analysts are more reputable than their counterparts.

Analysts' desire to communicate accurate information may not be the only reason for them to follow firms with low information asymmetries. We argue that, even if analysts are able to come up with accurate forecasts and recommendations for firms with high information asymmetries, it is not clear how their clients will benefit from their research. This is because any upside potential is likely to be exploited by insiders who can easily trade on information before anyone else. Bushman *et al.* (2005), for instance, show that analysts are less likely to follow those firms that do not allow their clients to benefit from their research. They show that firms in which insider trading restrictions are not enforced are less likely to attract analysts.

Contrary to above arguments, plentiful of literature indicates that analysts are more likely to follow firms with poor information environment (cf. Lehavy, Li and Merkley 2011). This strand of literature argues that, analyst being service providers, are more likely to be required for valuations in situations where investors cannot value firms themselves or cannot rely on market values. Dyck and Zingales (2004) show that investors discount shares of firms with information

asymmetries. In another related study, Lins (2003) documents similar findings. Therefore, analysts are required to provide additional scrutiny in these firms. Consistent with these arguments, Lang *et al.* (2004) show that analysts are of more importance in environments where information asymmetries are high. They note that additional scrutiny by analysts in such environments is of significant importance for investors.

2.3 Analyst following and intellectual capital disclose

Given that disclosure of intellectual capital reduces information asymmetries by providing a transparent image of the firm, we argue that there is more likelihood that analysts will choose to cover/follow firms with higher intellectual capital disclosure.

H1a: Firms with high intellectual capital disclosure should have higher analyst following/coverage relative to firms with less intellectual capital disclosure.

However, reduction in information asymmetries as a result of high intellectual capital disclosure may also induce analysts to follow those firms where their services are needed the most. Analysts, being service providers, should be needed the most for firms where information is not readily available. We, therefore, hypothesize a negative relationship between analyst following and intellectual capital disclosure.

H1b: Firms with high intellectual capital disclosure should have lower analyst following/coverage relative to firms with less intellectual capital disclosure.

3. Data

This paper examines the effect of intellectual capital disclosure on analyst following in a sample of biotechnology firms listed on the Copenhagen Stock Exchange during the period between 2001 and 2010. The following sub-sections will explain the data in greater detail.

3.1 Intellectual capital disclosure

The annual reports from Danish biotechnology firms (listed on the Copenhagen Stock Exchange) were used to compute the voluntary intellectual capital disclosure data. Voluntary intellectual capital disclosure in annual reports is scored using the index developed by Bukh *et al.* (2005). Bukh *et al.* (2005) use intellectual capital disclosure related to employees, customers, IT, processes, research and development, and strategic statements to develop comprehensive index. The index consists of 27 items related to employees, 14 items related to customers, 5 items related to IT, 8 items related to processes, 9 items related to research and development, and 15 items related to strategic statements. The disclosure information is scored either "1" for yes or "0" for no for each item. The categorical record is converted to a percentage for each company, by dividing by the sum of disclosures. In the case of individual dimensions, such as IT or strategic statements, the number of "1" scores was divided by the total number of items for that dimension. For example, if a company disclosed 9 of the 15 items for the strategic statements dimension, the score would be 60 percent (=9/15). This index has also been used successfully in plentiful of previous studies (Singh and Van Der Zahn, 2008; White *et al.*, 2007). Table 1 documents the descriptive statistics for intellectual capital disclosure during our sample period. Our results in Table 1 show that dispersion in intellectual capital disclosure gradually decreased during our sample period. For example, we report standard deviation in intellectual capital disclosure of 10.17 in 2001 and standard deviation in intellectual capital disclosure of 6.48 in 2010. Surprisingly, Table 1 reports a great deal of variation in intellectual capital disclosure across our sample period. For example, we show that maximum disclosure occurred in 2002, followed by 2009, 2003, and 2004.

[Insert Table 1 here]

3.2 Analyst following

We define analyst following by maximum number of analysts issuing annual earnings forecasts in a given year. Data for analyst following is obtained from I/B/E/S. Table 2 documents the descriptive statistics for analyst following during our sample period. Our results in Table 2 show that analyst following gradually increased during our sample period. For example, average

analyst following was 8.80 analysts in 2001, while it increased to 12.30 analysts in 2010. The same observation can be made for median analyst following. It shows a gradual increase of analyst interest in the biotechnology sector. Surprisingly, we also show that dispersion in analyst following also gradually increased during our sample period. Table 2, for example, reports standard deviation of 6.26 in 2001 and 9.09 in 2010.

[Insert Table 2 here]

3.3 Control variables

Consistent with prior literature, this article uses a number of firm-specific characteristics as control variables. For example, variables representing historic performance of a firm were added in accordance with Lang *et al.* (2004). We use last year's earnings per share (HISTEPS), and last year's market-adjusted returns (HISTRET) as proxies for historic performance. Lang *et al.* (2004) argue that analysts may be interested in firms with strong historic performance. We also add log of total assets (SIZE) as a control variable. Brennan and Hughes (1991) note that larger firms are likely to have more analysts covering them. Furthermore, dividend payout ratio (PoR), operational complexity (COMP), total debt to total asset ratio (LEVERAGE), and earnings per share (EPS) of a firm is added to control for the information environment of a firm. All of these factors can reduce information asymmetries present within a firm. Healy *et al.* (1999) argue that the information environment of a firm is an important determinant of analyst's decision to follow a firm. We obtain data for the above-mentioned variables from Worldscope. Table 3 documents the statistics for our control variables during our sample period. Panel A documents average values for control variables used in our analysis, while Panel B documents the correlation between different control variables. As is expected, Table 3, Panel A, shows that biotechnology firms have very low dividend payout ratios. We report median payout ratio of 0.00% and average payout ratio of 13.40% during our sample period. Table 3, Panel A, also shows that biotechnology firms have very low leverage. Furthermore, Table 3, Panel B, shows low correlation between our control variables, thereby allowing us to include these variables in regression analyses.

[Insert Table 3 here]

4. Methodology

4.1 Univariate analysis: Relationship between intellectual capital disclosure and analyst following

This paper hypothesizes that intellectual capital disclosure is a significant determinant of analyst following in the biotechnology sector. In order to document this relationship, we divide our sample into two groups – one with above median intellectual capital disclosure and the other with below median intellectual capital disclosure – and compute the difference in average analyst following between the two groups. Our results in Table 4 show that firms with above median intellectual capital disclosure are followed by, on average, 12.39 analysts, while this number is only 8.30 analysts for firms with below median intellectual capital disclosure. Table 4 also shows that there is a significant difference in analyst following between the two groups. We report difference of almost 4 analysts between the two groups.

[Insert Table 4 here]

4.2 Multivariate analysis: Relationship between intellectual capital disclosure and analyst following

In this section, we document the relationship between intellectual capital disclosure and analyst following using panel regression with fixed effects. In order to do so, we use analyst following (ANALYST) as a dependent variable and intellectual capital disclosure (ICD) as an independent variable. Our methodology is similar to that of Lang *et al.* (2004). Furthermore, we also include a number of control variables in our regression equation. These variables are log total assets (SIZE), total debt to total asset ratio (LEVERAGE), dividend payout ratio (PoR), earnings per share (EPS), operational complexity (COMP), last year's earnings per share (HISTEPS), and last year's market-adjusted returns (HISTRET), and year dummies (YDUM). Our basic regression takes the following form. It is important to mention here that we perform a Hausman test to identify the use of fixed effects in our analysis rather than random effects.

$$
\begin{aligned}
ANALYST &= \alpha + \beta_1(ICD) \\
&+ \beta_2(SIZE) + \beta_3(LEVERAGE) + \beta_4(COMP) + \beta_5(EPS) \\
&+ \beta_6(PoR) + \beta_7(HISTEPS) + \beta_8(HISTRET) + \sum_{Year} \beta^{Year}(YDUM) + \varepsilon
\end{aligned} \tag{1}
$$

The results of our analysis are reported in Table 5. Our results show that after controlling for other factors, an increase in intellectual capital disclosure corresponds to an increase in analyst following. We report significant and positive coefficients for ICD. The coefficient of 0.0973 indicates that, all else equal, a firm which increases its intellectual capital disclosure by 1 unit would have 0.09 more analysts following it. Our results indicate that as information asymmetry goes down, as a result of higher intellectual capital disclosure, analysts are tempted to follow the firm. Our result is consistent with prior literature that documents higher analyst following for firms with low information asymmetries (Lang and Lundholm, 1996; Healy *et al.*, 1999). Prior literature argues that analysts are reluctant to follow firms with high information asymmetry due to their concerns regarding their reputation (Stickel, 1992; Hong and Kubik, 2003). Furthermore, we show that most of the control variables are insignificant except size and operational complexity.

[Insert Table 5 here]

There may be concerns that the results reported in Table 5 are confined to certain stocks. For example, one can argue that small firms exhibit more information asymmetries and therefore are the ones that should benefit the most from improvement in intellectual capital disclosure. In order to address such concerns, we split our sample into two groups, one group with size higher than the median size of the sample and the other with size lower than the median size. We re-estimate Equation (1) for both sub-samples. The results are reported in Table 6. The results confirm our previous findings of higher intellectual capital disclosure leads to higher analyst following. Our results show significantly positive coefficient of ICD for both sub samples.

[Insert Table 6 here]

5. Discussion of results

In this section, we re-estimate Equation (1) by replacing ICD with individual components of intellectual capital disclosure. These components are related to employees, customers, IT, processes, research and development, and strategic statements. The results of our analysis are reported in Table 7. Our results show that intellectual capital disclosure related to employees and strategic statements are significant determinants of analyst following. However, intellectual capital disclosure related to strategic statements turns insignificant when we add all components together in a model. We also show that intellectual capital disclosure related to customers, IT, processes, and research and development are insignificant determinants of analyst following. Some of these results are surprising because we believe that intellectual capital disclosure related research and development should be the most important component of value generated by biotechnology firms. Insignificance of this component may indicate relative inability of analysts to understand technology used in the sector.

[Insert Table 7 here]

6. Conclusion

This article documents the relationship between intellectual capital disclosure and analyst following for biotechnology firms listed at the Copenhagen Stock Exchange during the period between 2001 and 2010. We document that analysts are more likely to follow firms with high intellectual capital disclosure. This finding is consistent with the hypothesis that analysts wish to follow those firms that are more transparent. Transparency allows analysts to issue more accurate forecasts and recommendations. Further, this article argues that intellectual capital disclosure improves the information environment of a firm by disclosing some of the value relevant information. Analysts are inclined to use this extra information and increase their following of such firms. Our results also show that intellectual capital disclosure related to employees and strategic statements are the most important disclosures for analysts. We show that analysts are more likely to follow firms with high intellectual capital disclosure related to employees and strategic statements. All other components of intellectual capital disclosure are insignificant.

References

Abhayawansa, S. and Abeysekera, I., (2009), Intellectual capital disclosure from sell-side analyst perspective, Journal of Intellectual Capital, Vol. 10, No. 2, pp. 294 - 306.

Arvidsson, S., (2011). Disclosure of non-financial information in the annual report: A management-team perspective. Journal of Intellectual Capital, 12 (2), pp. 277-300.

Beattie, V. and Thomson, S. J., (2007). Lifting the lid on the use of content analysis to investigate intellectual capital disclosures. Accounting Forum, 31 (2), pp.129-163.

Bornemann, M. and Leitner, K-H., (2002). Measuring and reporting intellectual capital: the case of a research technology organization. Singapore Management Review, 24, pp. 7-19.

Brennan, M. and Hughes, P., (1991). Stock prices and the supply of information. Journal of Finance, 46 (5), pp. 1665-1691.

Bukh, P.N., Nielsen, C., Gormsen, P., and Mouritsen, J., (2005). Disclosure of information on intellectual capital in Danish IPO prospectuses. Accounting, Auditing and Accountability Journal, 18 (6), pp. 713-732.

Bushman, R. M., Piotroski, J. D., and Smith, A. J., (2005). Insider trading restrictions and analysts' incentives to follow firms. Journal of Finance, 60 (1), pp. 35-66.

Canibano, L., Covarsi, M. G. A., and Sanchez, M. P., (1999). The value relevance and managerial implications of intangibles: A literature review. Paper presented at International Symposium: Measuring and Reporting Intellectual Capital: Experiences, Issues and Prospects, Amsterdam.

Cinquini, L., Passetti, E., Tenucci, A. and Frey, M., (2012), Analyzing intellectual capital information in sustainability reports: some empirical evidence, Journal of Intellectual Capital, Vol. 13, No. 4, pp. 531 - 561.

Dyck, A. and Zingales, L., (2004). Private benefits of control: An international comparison. Journal of Finance, 59 (2), pp. 537-600.

Fama, E., (1980). Agency problems and the theory of the firm. The Journal of Political Economy, 88 (2), pp. 288-307.

Flöstrand, P., (2006), The sell side - observations on intellectual capital indicators, Journal of Intellectual Capital, Vol. 7, No. 4, pp. 457 - 473.

Garcia-Ayuso, M., (2003). Factors explaining the inefficient valuation of intangibles. Accounting, Auditing & Accountability Journal, 16 (1), pp. 57-69.

Guthrie, J., Ricceri, F. and Dumay J., (2012). Reflections and projections: A decade of Intellectual Capital Accounting Research, The British Accounting Review, Vol. 44, No. 1, pp. 68-82.

Hayton, J. C., (2005). Competing in the new economy: The effect of intellectual capital on corporate entrepreneurship in high-technology new ventures. R&D Management, 35 (2), pp. 137-155.

Healy, P. M., Hutton, A. P., and Palepu, K. G., (1999). Stock performance and intermediation changes surrounding sustained increases in disclosure. Contemporary Accounting Research, 16 (3), pp. 485-520.

Holland, J., (2003). Intellectual capital and the capital market–organisation and competence. Accounting, Auditing & Accountability Journal, 16 (1), pp. 39-48.

Holland, J., (2006). Fund management, intellectual capital, intangibles and private disclosure. Managerial Finance, 32 (4), pp. 277-316.

Holland, J. and Johanson, U., (2003), Value-relevant information on corporate intangibles - creation, use, and barriers in capital markets - "between a rock and a hard place", Journal of Intellectual Capital, Vol. 4, No. 4, pp. 465 - 486

Hong, H. and Kubik, J. D., (2003). Analyzing the analysts: Career concerns and biased earnings forecasts. Journal of Finance, 58 (1), pp. 313-351.

Lang, M., and Lundholm, R., (1996). Corporate disclosure policy and analyst behavior. The Accounting Review, 71 (4), pp. 467-492.

Lang, M. H., Lins, K. V., and Miller, D. P., (2004). Concentrated control, analyst following, and valuation: Do analysts matter most when investors are protected least? Journal of Accounting Research, 42 (3), pp. 589-623.

Lehavy, R., Li, F. and Merkley, K., (2011). The Effect of Annual Report Readability on Analyst Following and the Properties of Their Earnings Forecasts. The Accounting Review, Vol. 86, No. 3, pp. 1087-1115.

Lins, K., (2003). Equity ownership and firm value in emerging markets. Journal of Financial and Quantitative Analysis, 38 (1), 159-184.

Meer-Kooistra, J. and Zijlstra, S. M., (2001). Reporting on intellectual capital. Accounting, Auditing & Accountability Journal, 14 (4), pp. 456-76.

Mouritsen, J., Bukh, P.N., Johansen, M.R., Larsen, H.T., Nielsen, C., Haisler, J. and Stakemann, B. (2003), Analysing Intellectual Capital Statements, Danish Ministry of Science, Technology and Innovation, Copenhagen, available at: www.vtu.dk/icaccounts

Nielsen, C., Bukh, P.N., Mouritsen, J., Johansen, M.R. and Gormsen, P., (2006), Intellectual capital statements on their way to the stock exchange: Analyzing new reporting systems, Journal of Intellectual Capital, Vol. 7, No. 2, pp. 221 - 240

Nielsen, C. (2008). A content analysis of Analyst Research: Health Care through the Eyes of Analysts. Journal of Health Care Finance, Vol. 34, No. 3, pp. 66-90.

Nielsen, C., and Madsen, M. T. (2009). Discourses of transparency in the Intellectual Capital reporting debate: Moving from generic reporting models to management defined information. *Critical Perspectives on Accounting*, Vol. 20, No. 7, pp. 847-854.

Rimmel, G. Nielsen, C. and Yosano, T., (2009), Intellectual capital disclosures in Japanese IPO prospectuses, Journal of Human Resource Costing & Accounting, Vol. 13, No. 4, pp. 316 - 337

Royal, C, and O'Donnell, L., (2008), Emerging human capital analytics for investment processes, Journal of Intellectual Capital, Vol. 9, No. 3, pp. 367 - 379.

Prusak, L. and Cohen, D., (2001). How to invest in social capital. Harvard Business Review, 79 (6), pp. 86-93.

Singh, I. and Van der Zahn, J-L. W. M., (2008). Determinants of intellectual capital disclosure in prospectuses of initial public offerings. Accounting and Business Research, 38 (5), pp. 409-431.

Singh, I., Mitchell Van der Zahn, J.-L.W., (2007), Does intellectual capital disclosure reduce an IPO's cost of capital?: The case of underpricing, Journal of Intellectual Capital, Vol. 8, No. 3, pp. 494 - 516

Sofian, S., Abdul Rashid, S. Z., Mehri, M., and Rashid, M. A., (2011). Moderating effect of intellectual capital on relevance of earnings and cost of equity relationship: Review of contemporary literature. Australian Journal of Basic and Applied Sciences, 5 (9), pp. 1633-1639.

Stickel, S. E., (1992). Reputation and performance among security analysts. Journal of Finance, 47 (5), pp. 1811-1836.

Thompson, P. and Randall, B., (2000). Accounting for intellectual capital: Shaping the future through the knowledge economy. Singapore Accountant, March/April, pp. 32-39.

White, G., Lee, A., and Tower, G., (2007). Drivers of voluntary intellectual capital disclosure in listed biotechnology companies. Journal of Intellectual Capital, 8 (3), pp. 517-537.

White, G., Lee, A., Yuningsih, Y., Nielsen, C. and Bukh, P.N., (2010), The nature and extent of voluntary intellectual capital disclosures by Australian and UK biotechnology companies, Journal of Intellectual Capital, Vol. 11, No. 4, pp. 519 - 536

Williams, M., (2001). Is intellectual capital performance and disclosure practice related? Journal of Intellectual Capital, 2 (3), pp. 192-203.

Table 1: Descriptive statistics for intellectual capital disclosure

Following table documents the descriptive statistics for intellectual capital disclosure of biotechnology firms listed at the Copenhagen Stock Exchange. The sample period is from 2001 to 2010.

	Mean	Median	Standard Deviation	No. of Firm
2001	17.75	15.38	10.17	13
2002	23.27	23.08	12.66	13
2003	21.79	23.08	10.23	13
2004	21.34	21.15	9.54	16
2005	20.86	19.23	9.47	18
2006	19.16	19.23	6.94	19
2007	19.02	17.95	6.72	19
2008	19.02	19.23	7.44	19
2009	21.86	20.51	7.45	19
2010	19.77	16.67	6.48	19

Table 2: Descriptive statistics for analyst following

Following table documents the descriptive statistics for analyst following of biotechnology firms listed at the Copenhagen Stock Exchange. The sample period is from 2001 to 2010.

	Mean	Median	Standard Deviation	No. of Firms
2001	8.80	9.50	6.26	10
2002	11.70	12.00	7.80	10
2003	10.90	9.50	8.96	10
2004	10.00	8.00	7.09	11
2005	10.33	9.50	7.93	12
2006	10.84	9.00	8.44	13
2007	9.50	8.50	7.95	14
2008	9.92	10.00	7.57	14
2009	10.61	11.00	7.42	13
2010	12.30	13.00	9.09	13

Table 3: Statistics for control variables

Following table documents the statistics for control variables used in regression analysis. The sample consists of biotechnology firms listed at the Copenhagen Stock Exchange. The sample period is from 2001 to 2010. Panel A documents the descriptive statistics for the control variables, while Panel B documents correlation between control variables.

Panel A: Descriptive statistics

	Mean	Median	Standard Deviation	No. of Observations
SIZE	14.42	14.77	2.14	159
LEVERAGE	0.23	0.15	0.41	159
COMP	0.38	0.38	0.07	144
EPS	4.60	2.10	7.22	129
PoR	13.40	0.00	17.14	153
HISTRET	0.01	-0.02	0.50	124
HISTEPS	4.42	2.20	7.19	115

Panel B: Correlation matrix

	SIZE	LEVERAGE	COMP	EPS	PoR	HISTRET	HISTEPS
SIZE	1.00						
LEVERAGE	0.02	1.00					
COMP	-0.04	0.15	1.00				
EPS	0.46	0.38	0.10	1.00			
PoR	0.50	-0.01	0.07	0.38	1.00		
HISTRET	0.13	0.10	-0.11	0.13	0.01	1.00	
HISTEPS	0.34	0.31	-0.02	0.45	0.14	-0.02	1.00

Table 4: Univariate analysis: Relationship between intellectual capital disclosure and analyst following
Following table documents the difference between analysts following of high intellectual capital disclosure firms and low intellectual capital disclosure firms. High intellectual capital disclosure is defined as above the median disclosure, while low intellectual capital disclosure is below the median disclosure. The sample consists of biotechnology firms listed at Copenhagen Stock Exchange. The sample period is from 2001 to 2010. The coefficients with 1% significance are followed by ***, coefficient with 5% by **, and coefficients with 10% by *.

	Intellectual Capital Disclosure		
	High	**Low**	**Difference**
Average Analyst Following	12.39	8.30	4.09***
No. of Observation	61	62	

Table 5: Multivariate analysis: Relationship between intellectual capital disclosure and analyst following
Following table documents the relationship between intellectual capital disclosure and analyst following for biotechnology firms listed at the Copenhagen Stock Exchange using panel regression with fixed effects. The sample period is from 2001 to 2010. The coefficients with 1% significance are followed by ***, coefficient with 5% by **, and coefficients with 10% by *.

ICD	0.0973**
SIZE	1.1369**
LEVERAGE	-1.2563
COMP	6.5952*
EPS	0.0368
PoR	0.0253
HISTRET	0.1448
HISTEPS	0.0305
Year Dummies	Included
No. of Observations	99
R-Square (Within)	0.4492
F-Value	3.52

Table 6: Relationship between intellectual capital disclosure and analyst following for sub-samples of large and small firms

Following table documents the relationship between intellectual capital disclosure and analyst following for sun-samples of large and small biotechnology firms listed at the Copenhagen Stock Exchange using panel regression with fixed effects. The sample period is from 2001 to 2010. The coefficients with 1% significance are followed by ***, coefficient with 5% by **, and coefficients with 10% by *.

	Large Firms	**Small Firms**
ICD	0.1259**	0.1238***
SIZE	0.5218	0.7599
LEVERAGE	-20.1151**	5.9664
COMP	2.2374	5.3078**
EPS	-0.1184	0.0191
PoR	-0.0085	0.1087
HISTRET	-0.4063	-0.3495
HISTEPS	0.0415	0.0041
Year Dummies	Included	Included
No. of Observations	56	43
R-Square (Within)	0.4919	0.6572
F-Value	1.94	2.28