Does the financial analysts' usage of non-financial information influence the analysts' forecast accuracy? Some evidence from the Belgian sell-side financial analyst

Raf Orens [a,b,*], Nadine Lybaert [a]

[a] *Hasselt University, Department of Business Studies, Agoralaan, Gebouw D, 3590 Diepenbeek, Belgium*
[b] *University of Antwerp, Department of Accounting and Finance, Prinsstraat 13, 2000 Antwerp, Belgium*

Abstract

This paper examines whether the use of non-financial information by sell-side financial analysts influences the accuracy of analysts' forecasts. The research findings, based on a survey of Belgian financial analysts, suggest that financial analysts who use more forward-looking information and more internal-structure information offer more accurate forecasts. Furthermore, the listed Belgian firms examined in this study have improved their non-financial information reporting over time. However, neither the frequency nor the quantity of non-financial information mentioned by financial analysts in their reports appears to have increased over time.
© 2007 University of Illinois. All rights reserved.

Keywords: Analyst reports; Annual reports; Disclosure; Financial analysts' forecast accuracy; Non-financial information; Non-financial information use

1. Introduction

Earlier research emphasizes the important role of sell-side financial analysts on capital markets (Barker, 1998; Holland & Johansson, 2003; Covrig & Low, 2005). By means of

---

their analyses, earnings forecasts and recommendations, financial analysts have a significant influence on the investment community. However, investors have to be cautious when making investment decisions based on analysts' predictions because earnings forecasts tend to be optimistic (Capstaff, Rees, & Paudyal, 1998; Duru & Reeb, 2002; Gu & Wu, 2003) and dispersed (Stickel, 1992; Sinha, Brown, & Das, 1997). Numerous studies (e.g., Clement, 1999; Jacob, Lys, & Neal, 1999; Brown, 2001) document that the differences in the forecast accuracies are influenced by various factors as, for instance, the years of experience of the financial analyst, the number of companies followed by the financial analyst, or the size of the company assessed by the financial analyst.

The extent to which financial analysts use corporate information is rarely judged. This may be surprising, especially since analysts require firms to voluntarily disclose more information. In this study we examine whether or not financial analysts really use the information that is voluntarily disclosed by listed firms and if so whether its use influences the analysts' forecast accuracy.

Moreover, this paper concentrates on voluntary non-financial information. This type of information can be defined as "all information disclosed outside the financial statements issued by the company" (Robb, Single, & Zarzeski, 2001). Prior research (Amir & Lev, 1996, Ittner & Larcher, 1999; Lev & Zarowin, 1999; Graham, Cannice, & Sayre, 2002; Beretta & Bozzolan, 2004; Liang & Yao, 2005) documents the increased relevance of non-financial information due to increased competition and globalization, technological developments, and the introduction of new businesses. When financial analysts predict future earnings, they have to rely on non-financial information such as the future activities of the company or the acquisitions realized by the company. Vanstraelen, Zarzeski, and Robb (2003) find that the disclosure of non-financial forward-looking information positively influences the accuracy of the analysts' earnings forecasts.

The purpose of this paper is to directly relate the analysts' use of information and their forecast accuracy. Our study is similar to McEwen and Hunton (1999) with one major difference: we examine non-financial information while McEwen and Hunton concentrate on financial information.

This research topic is important for the following reasons. First, corporate managers are interested in the extent to which financial analysts actually use the non-financial information published by the companies. More importantly managers want to know whether the analysts' use of reported information really influences their forecasts. By studying this relationship, corporate managers may be able to enhance their disclosure strategy in regard to information that might influence the output of financial analysis. Besides, earlier studies have examined the benefits to the firms such as lowering cost of capital or increasing firm value as a result of disclosing more relevant information (Sengupta, 1998; Lang, Lins, & Miller, 2003; Richardson & Welker, 2001).

In addition, analysts and regulators have another consideration. In particular, do regulator's requirements fulfill the information needs of financial analysts and, if not, which changes are needed?

La Porta, Lopez-de-Silanes, Schleifer, and Vishny (1997) distinguish two legal systems: the civil-law system and the common-law system. Legislation in the latter system (as in the United States and the United Kingdom) is based on judgments, whereas legislation in the civil-law system is part of a scholar- and legislator-made tradition. Due to differences within

the civil-law countries, La Porta et al. (1997) subdivide them into three groups: the French civil-law system (e.g., Belgium, France, Spain), the German civil-law system (e.g., Germany, Japan), and the Scandinavian or the Nordic civil-law system (e.g., Norway, Sweden). Based on prior literature findings, Table 1 provides a comparison of various environmental and institutional characteristics between the four legal systems (Belgium's scores are included for comparison).

Legal systems differ in terms of the amount of required disclosure. La Porta, Lopez-de-Silanes, and Schleifer (2006) found that companies in common-law countries provide more information than companies in civil-law countries. The system in Belgium, as well as the majority of French civil-law countries, does not oblige companies to report as much information as in the common-law countries.

Table 1 shows further that the legal rules protecting investors and creditors differ between countries. Shareholders and creditors are most protected in common-law countries, while these stakeholders are least protected in the French civil-law countries (La Porta, Lopez-de-Silanes, Schleifer, & Vishny, 1998); shareholders in Belgium, for example, do not possess any rights included in the La Porta et al. measurement while creditors are moderately supported. However, based on the liability standard, La Porta et al. (2006) demonstrate that investors in Belgium are more protected compared to average investors in the French and German civil-law countries, but are less protected compared to the average common-law and Nordic civil-law countries.

To be effective, enforcement of these regulations is essential. La Porta et al. (1998) proxy the quality of law enforcement by the characteristics of the judicial system, rule of law, corruption, risk of expropriation and contract repudiation by governments. They demonstrate that the quality of law enforcement is the highest in Nordic and German civil-law countries, followed by common-law countries, with the lowest being the French civil-law countries. In Belgium, however, the quality of law enforcement is similar to that in Nordic and German civil-law countries. Yet, the picture is less favorable when comparing Belgium's scores on the other measurements of enforcement developed by Mueller, Gernon, and Meek (1994), Hope (2003), or La Porta et al. (2006). All these studies show that Belgium scores very low in comparison with the average civil- and common-law countries.

The low-level investor protection may induce management to manipulate accounting results. In fact, Leuz, Nanda, and Wysocki (2003) show that companies in French and German civil-law countries manipulate their earnings to a larger extent when compared to companies in common-law and Nordic civil-law countries. The situation in Belgium is very comparable to the average French civil-law country. In addition, La Porta et al. (1998) document that countries with low investor protection have more concentrated ownership structure; the ownership structure in Belgium is less dispersed compared to companies operating in common-law, Nordic civil-law and German civil-law countries (Table 1). These factors taken together might explain the limited importance of equity markets in these countries. In general, however, the information environment has not reached the level of the capital markets in the other legal structures.

Finally, Belgium is characterized in Hofstede's (2001) comparison of cultures by a high level of both power distance, and uncertainty avoidance, a position very comparable to other French civil-law countries. But, in contrast to the average French civil-law countries,

Table 1
Comparison of the information, institutional and cultural environment between Belgium and the four legal systems

Characteristic	Source	Description	Belgium (French civil)	Mean French civil	Mean German civil	Mean Nordic civil	Mean English common
Disclosure requirements	La Porta et al. (2006)	Information requirements such as prospectus delivered at an IPO and information about compensation of directors, ownership structure, inside ownership by directors, irregular contracts and transactions between the issuer and related parties	0.42	0.42	0.60	0.56	0.78
Protection of shareholders and investors							
Antidirector rights	La Porta et al. (1998)	Index aggregating shareholder rights such as their permission to vote by mail, the prohibition of blocking shares for the shareholders' meeting or the incidence of laws protecting oppressed minorities	0	1.76	2.00	2.50	3.39
Creditor rights	La Porta et al. (1998)	Index aggregating creditor rights such as the prohibition of secured investors having an automatic stay on assets when a reorganization occurs, the requirement to pay secured creditors first or the replacement of management by an reorganization	2	1.58	2.33	2.00	3.11
Liability standard	La Porta et al. (2006)	The extent to which an investor is able to recover losses from the issuer, the directors, the distributors and the accountant when misleading information is included in the prospectus	0.44	0.39	0.42	0.47	0.58
Quality of law enforcement							
Judicial efficiency	La Porta et al. (1998)	The efficiency and integrity of the legal environment as it affects business	9.50	6.56	8.54	10.00	8.15
Rule of law	La Porta et al. (1998)	Assessment of the law and order tradition in the country	10.00	6.05	8.68	10.00	6.46
Corruption	La Porta et al. (1998)	The corruption of a country (the lower the score, the higher the level of corruption)	8.82	5.84	8.03	10.00	7.06
Risk of expropriation	La Porta et al. (1998)	The risk of outright confiscation or forced nationalization	9.63	7.46	9.45	9.66	7.91

Repudiation of contract by government	La Porta et al. (1998)	The risk of a modification in a contract taking the form of a postponement or scaling down	9.48	6.84	9.47	9.44	7.41
Audit spending	Mueller et al. (1994)	Assessment of how much a country spends on audit services relative to the economy	0.18	0.48	0.25	0.23	0.28
Enforcement Hope	Hope (2003)	Degree of enforcement based on audit spending, judicial efficiency, rule of law, insider trading laws and anti director rights	−1.89	−2.25	−1.20	0.12	−0.09
Public enforcement	La Porta et al. (2006)	Index including characteristics of the supervisor of securities markets, the power of the supervisor to issue rules, the investigative power of the supervisor and sanctions	0.15	0.53	0.25	0.38	0.62
Earnings management score	Leuz et al. (2003)	Average score on the level of earnings management	19.50	19.27	23.60	10.15	11.74
Ownership structure	La Porta et al. (1998)	Mean ownership by the three largest shareholders of the 10 largest nonfinancial domestic firms	0.54	0.54	0.34	0.37	0.43
Importance equity markets							
External capitalization/GNP	La Porta et al. (1997)	The ratio of stock market capitalization held by minorities to gross national product in 1994	0.17	0.21	0.46	0.30	0.60
Domestic firms/population	La Porta et al. (1997)	The ratio of the number of domestic listed firms in a given country to its population in 1994	15.50	10.00	16.79	27.26	35.45
IPO/population	La Porta et al. (1997)	The ratio of the number of IPOs of equity in a given country to its population in 1994	0.30	0.19	0.12	2.14	2.23
Culture							
Power distance	Hofstede (2001)	The extent to which people accept an unequal, hierarchical distribution of power	65	65.89	42.00	28.25	49.23
Uncertainty avoidance	Hofstede (2001)	The degree to which people feel uncomfortable with ambiguity and an uncertain future	94	80.37	73.17	40.25	44.38
Individualism	Hofstede (2001)	The degree of integration among members in a society	75	37.89	45.17	69.25	57.77
Masculinity	Hofstede (2001)	The preference for achievement, heroism, assertiveness and material success	54	49.89	65.67	13.75	56.77

Belgium also scores high on individualism. Regarding the masculinity variable, Belgium is comparable to the average French civil-law country.

There are two important implications to be drawn from our multi-country analysis. First, as the level of disclosure requirements is quite low in Belgium, it can be assumed that other disclosures by Belgian companies are voluntary in response to demands from various stakeholders. The extent to which this voluntary disclosure extends to non-financial information is one objective of this study. Second, the less protected investors or shareholders and the lower information requirements are, the more that investors are likely to rely on financial analysts. This statement is empirically supported by Covrig and Low (2005) for financial analysts and Japanese companies (characterized by a low-quality financial-reporting system). It is, therefore, possible that financial analysts following Belgian companies also exert a greater influence on the decision made by the investment community. Indeed, Sercu and Sips (1993) and Engelen (1999) observe that investors benefit from following the recommendations of financial analysts.

Our research findings demonstrate that listed Belgian companies voluntarily provide additional non-financial information in annual reports over time. Nevertheless, this improvement does not result in an increase in the overall amount of non-financial information provided in the analyst reports, except for the amount of forward-looking information and information about the internal structure of companies. The analysis also reveals that those financial analysts relying more on these information items make more accurate forecasts.

The outline of the remainder of this paper is structured as follows. Section 2 reviews some prior literature findings and states some hypotheses. Section 3 discusses the research design; section 4 presents the research findings. The final section summarizes the paper and provides some questions for further research.

2. Theoretical framework and hypotheses

Before discussing the main research question, we need to generate base information and review literature about the following sub-research questions:

(1) Which voluntary non-financial information do the listed firms disclose and whether the amount of their disclosure evolved during the years under study?
(2) Which voluntary non-financial information do financial analysts use and how the amount has evolved during the years under study?
(3) Are corporate managers making an effort to disclose more non-financial information in the information categories that financial analysts find important?

With respect to the first sub-research question, Beattie, McInnes, and Fearnley (2002) examine the annual reports of 11 British companies and observe that these companies provide much descriptive information as well as information about management and shareholders. On the other hand, managers give less attention to forward-looking information and information about reasons for changes in performance. Similar research findings are observed in Vanstraelen et al. (2003) for 120 Belgian, Dutch, and German companies. Other studies focus on the disclosure of intellectual capital (IC) information. Guthrie and Petty (2000), for example, analyze the annual reports of the 20 largest Australian companies and find that firms report more

information about their external structure (e.g., brand names, customer loyalty) compared to internal structure (e.g., patents, research and development) and human capital (e.g., education, know-how). The same conclusions are in Bozzolan, Favotto, and Ricerri (2003) that examines the IC information reporting of 30 Italian firms, and in Brennan (2001) for 11 Irish firms.

Over time, there appears to be an increase in the disclosure of non-financial information as shown by Moneva and Llena (2000) for environmental information in the annual reports of 70 Spanish companies and by Marston and Polei (2004) for both environmental and corporate governance information on the websites of 50 German companies. Vandemaele, Vergauwen, and Smits (2005) find that the top 20 listed companies of the Netherlands, Sweden, and the United Kingdom report more IC information over the period 1998–2000, while no significant change was found for the period 2000–2002. Abdolmohammadi (2005) concentrates his study on 58 United States companies and shows an improvement in the disclosure of IC information over the period 1993–1997.

The major consequence of reporting voluntary non-financial information seems to be a reduction in the information asymmetry (Lang and Lundholm, 2000; Brown, Hillegeist, & Lo, 2004; Guo, Lev, & Zhou, 2004), which leads to a reduction of the risk of investing in the reporting company. This diminished risk in turn improves the liquidity of the companies' shares (Healy, Hutton, & Palepu, 1999; Leuz and Verrecchia, 2000). Consequently, more efficient investment decisions can be obtained (Gray, Radebaugh, & Robert, 1990). Another benefit appears to be a decrease in the firms' cost of capital (Welker, 1995; Francis, Khurana, & Pereira, 2005). Sengupta (1998) documents that a policy of timely and detailed disclosures results in a decrease of the cost of debt for the company. Botosan (1997), Botosan and Plumlee (2002), and Hail (2002) demonstrate that an increased reporting of voluntary information in annual reports is associated with a lower cost of equity. Healy and Palepu (1993) further suggest that financial analysts are more convinced about the reliability of mandated information when companies also disclose voluntary information. Moreover, financial markets continue to demand more information in order to make investment decisions (Grüning & Stöckmann, 2004; Kristensen and Westlund, 2004).

The Financial Services Action Plan that was launched by the European Commission in 1999 aims at improving the functioning of pan-European capital markets by 2005 as noted in Directive 2004/109/EC on the harmonization of transparency requirements following an earlier directive (Directive 2001/34/EC on the admission of securities to official stock exchange listing and on information to be published on those securities). Listed Belgian companies are, for instance, required to publish a separate annual report including financial statements along with a management's discussion and analysis. This directive is integrated into the Belgian law by the issuance of the Royal Decree of March 31, 2003. Although these requirements are mainly financial, listed firms are also disclosing more non-financial information on a voluntary basis due to their perceived beneficial effects. These arguments lead to the following hypothesis (stated in the alternative form):

H1. The disclosure of voluntary non-financial information by listed firms is increasing over time.

To gain insight into the use of non-financial information by financial analysts, several studies examined the "contents" of the financial analysts' reports. Among the first studies to

analyze the content of analyst reports are Previts, Bricker, Robinson, and Young (1994) and Rogers and Grant (1997). Both studies observe that financial analysts pay limited attention to non-financial information. Nielsen (2005) finds that analysts' reports contain detailed background information about the company, but intellectual capital information is infrequently discussed. García-Meca and Martínez (2007) also observe a limited reliance on intellectual capital information (human capital, innovation, research and development projects), and report that financial analysts rely mainly on information about company strategy. Breton and Taffler (2001) find that financial analysts frequently use non-financial information about market conditions. The survey results in Dempsey and Gatti (1997) indicate that financial analysts often rely on non-financial performance measurements to judge the value of the company; Ho and Wong (2004) document that financial analysts mainly use information about a company's future prospects, market share, and acquisitions or disposals.

Recent studies (e.g., Nielsen, 2005; García-Meca & Martínez, 2007) point out the growth in the use of non-financial information by financial analysts over time. Due to technological developments, increased competition among companies, globalization, and the introduction of new business, non-financial information is gaining in importance for judging the value of a company (Amir & Lev, 1996; Lev & Zarowin, 1999; Graham et al., 2002; Beretta & Bozzolan, 2004). Thus, even if firms may not provide more non-financial information over time, it can be assumed that financial analysts will search for such information. This gives rise to the following hypothesis (stated in the alternative form):

H2. The use of voluntary non-financial information by financial analysts is increasing over time.

Hirst, Koonce, and Simko (1995), Ackert, Church, and Shehata (1996) and Womack (1996) document that the investment community relies to a large degree on the analyses and recommendations made by financial analysts. It is, therefore, expected that the disclosure of voluntary non-financial information will mainly be directed to those categories that analysts find important. However, as Nielsen (2005) observes, annual reports include more intellectual capital, corporate governance and social and sustainability information compared to analyst reports. Conversely, financial analysts refer more often to segment information and background information about the company. Due to the financial analysts' influence on corporate managers, we posit the following hypothesis:

H3. Corporate managers make an effort to disclose more non-financial information in those categories that financial analysts mention more frequently in analyst reports.

Plumlee (2003) makes reference to a large number of studies showing that financial analysts fail to include all information in their analyses. Numerous studies relate the level of forecast accuracy to firm-specific attributes such as the level of disclosure of listed companies (Vanstraelen et al., 2003) or the complexity of the information reported (Plumlee, 2003). Other studies relate differences in forecast accuracy to analyst-specific attributes such as experience or task complexity (Jacob et al., 1999; Brown, 2001). McEwen and Hunton (1999) find that the use of key ratios (share-price information and five-year earnings summary) is positively associated with the analysts' forecast accuracy. Conversely, the

analysts who rely merely on financial statement information (information from the balance sheet or the footnotes) are forecasting less accurately.

Some studies document the relationship between the disclosure of non-financial information and the analysts' forecast accuracy. In particular, Vanstraelen et al. (2003) show a positive relationship between the reporting of non-financial forward-looking information by Belgian, Dutch, and German firms and the analysts' forecast accuracy. The empirical study by McEwen and Hunton (1999) demonstrates that financial analysts make more accurate forecasts when they use more information than what is included in the financial statements. Since non-financial information is defined as all information disclosed outside the financial statements of a company, we posit the hypothesis that financial analysts who employ more non-financial information are forecasting more accurately.

H4. The financial analysts' usage of voluntary non-financial information is positively related to his/her forecast accuracy.

3. Research design

In the first stage of our research, we study the content of annual reports since these reports are an important source of information for financial analysts (Vergoossen, 1993; Blij, 2001; Ho & Wong, 2001). The narrative sections of the annual reports of 2001, 2003 and 2005 are examined. The sample contains all listed Belgian companies that have a market capitalization of more than 75 million euro at the end of the fiscal year 2005, excluding banks, insurance companies, holding and real estate companies, and have annual reports for all periods. The final sample consisted of 40 annual reports for each year.

We examine the financial analysts' use of voluntary non-financial information by first studying the analysts' reports that are made public after the issuance of the 2001, 2003, and 2005 annual reports for each of the 40 listed companies in the sample. That is, the content of company reports[1] that were issued by financial analysts of local Belgian brokerage firms, was investigated. If a financial analyst published more than one report following the issuance of annual reports in the years of study, only the first one was used in the sample. The final sample comprised 52 analyst reports issued in 2002, 63 analyst reports issued in 2004, and 62 analyst reports issued in 2006.

To research the content of the annual reports and the analysts' reports, we use a disclosure index that relies heavily on the information items recommended by the *American Institute of Certified Public Accountants (AICPA)* and the *Financial Accounting Standards Board (FASB)*. Studies such as Rogers and Grant (1997) or Nielsen (2005), among others, base their disclosure indexes on these recommendations as well.

In 1994, the AICPA established a reporting model which includes a comprehensive set of relevant corporate financial and non-financial information that users of corporate information are thought to require. This reporting model consists of a limited number of recommendations classified into five information categories: (a) business data, (b) management's analysis of

---

[1] In general, two types of analyst reports can be considered: result reports and company reports. The latter contain lots of corporate information in order to make a fundamental analysis of the company, while the first only discuss an event taking place in the company, hereby limiting the amount of information in such reports.

financial and non-financial data, (c) forward-looking information, (d) information about management and shareholders, and (e) background information about the company. Four of these five information categories contain information of a largely non-financial nature; only the category "business data" mainly contains financial data. To this, the FASB (2001) recommended adding information about the firm's intangibles.

For this study, the disclosure index contains five information categories. Four of them are based on the AICPA recommendations. The fifth information category includes non-financial information indicators as recommended by the FASB (2001) paper plus the non-financial information indicators of the "business data" information category of the AICPA (1994) paper. In our study, we call this information category "intellectual capital information". To summarize, our disclosure index consists of 71 information items assigned to the following five information categories:

- Management's analysis of financial and non-financial data (ANA): 11 items;
- Forward-looking information (FWL): 11 items;
- Information about management and shareholders (MAN): 6 items;
- Background information about the company (BI): 23 items;
- Intellectual capital information (IC): 20 items.

These 71 non-financial information items are summed up in column 1 of Table 2 as shown.

In Table 2, some of the information categories are divided into two or three sub-categories such as the items of the information categories ANA and BI. If an annual report or an analyst report incorporates an item, it gets the value "one", and otherwise "zero".[2]

In the second stage of the study, we have sent a questionnaire to all sell-side financial analysts employed by a Belgian brokerage house who were also included in our sample of analysts' reports. The questionnaire contained the same list of non-financial information items used in the content analysis noted earlier. Each analyst had to indicate on a five-point Likert scale, ranging from zero (=never used) to four (=always used),[3] the extent to which (s)he uses each item in the analysis of the companies (s)he follows. The questionnaire also contained some demographic questions for the analyst such as the number of years of experience and the number of companies followed. The survey mailing resulted in 31 responses, a response rate of 63%.

The analysts' forecast accuracy was measured as the absolute value of the difference between the actual earnings per share (EPS) and the forecasted EPS divided by the actual EPS (Fort, 1997; Capstaff et al., 1998; Ho & Tsay, 2004). The data was obtained from the database AQUTE. This database provides data about the performance of financial analysts all over the world for the listed companies they follow. Both the survey results and the disclosure index of the content analysis were related to the mean earnings forecast accuracy.

---

[2] This binary coding scheme is often criticized, as it does not take into account the differences in importance attached to the various information items. However, previous studies found similar results whether or not the information items were weighted (Cooke, 1989; Marston and Shrives, 1991; Meek et al., 1995).

[3] The Likert scale is composed as follows: zero = never used, one = rarely used, two = sometimes used, three = often used, four = always used. The questionnaire can be obtained from the authors.

Table 2
Frequency table of the disclosure and the usage of voluntary non-financial information

Column 1: information items		Column 2: annual reports 2001	Column 3: annual reports 2003 (change from 2001)	Column 4: annual reports 2005 (change from 2001)	Column 5: analyst reports 2002	Column 6: analyst reports 2004 (change from 2002)	Column 7: analyst reports 2006 (change from 2002)
		$N=40$	$N=40$	$N=40$	$N=52$	$N=63$	$N=62$
Category I: management's analysis of financial and non-financial data (ANA)							
ANA.A	Reasons for changes in the financial, operating and performance related data						
ANA.1	Reasons identified by management for changes in volume of units sold or in revenues	88%	+5%	+10%	77%	+2%	+15%
ANA.2	Reasons identified by management for changes in innovation	33%	+5%	+8%	17%	−6%	−6%
ANA.3	Reasons identified by management for changes in profitability	85%	−3%	+8%	81%	+11%	+8%
ANA.4	Reasons identified by management for changes in long-term financial position	40%	+18%	+18%	44%	0%	−6%
ANA.5	Reasons identified by management for changes in short-term liquidity and financial flexibility	30%	+3%	+3%	8%	+11%	+25%
ANA.6	Unusual or nonrecurring events and their past effect on the company	28%	+3%	+3%	12%	+14%	+17%
ANA.B	The identity and past effect of key trends						
ANA.7	Social trends and their past effect on the company	15%	+5%	−8%	17%	−6%	−8%
ANA.8	Demographic trends and their past effect on the company	0%	+10%	+8%	0%	0%	+6%
ANA.9	Political trends and their past effect on the company	3%	0%	+8%	6%	+4%	+1%
ANA.10	Macro-economic trends and their past effect on the company	58%	−13%	+5%	46%	−8%	−16%
ANA.11	Regulatory trends and their past effect on the company	5%	+18%	+20%	17%	−8%	−4%

Table 2 (*continued*)

Column 1: information items		Column 2: annual reports 2001	Column 3: annual reports 2003 (change from 2001)	Column 4: annual reports 2005 (change from 2001)	Column 5: analyst reports 2002	Column 6: analyst reports 2004 (change from 2002)	Column 7: analyst reports 2006 (change from 2002)
		N=40	N=40	N=40	N=52	N=63	N=62
Category II: forward-looking information (FWL)							
FWL.1	The future risks of the company	30%	+13%	+55%	73%	+3%	+11%
FWL.2	The future opportunities of the company	58%	+8%	+33%	77%	+12%	+7%
FWL.3	The effects of the risks and opportunities on the business's future earnings and future cash flows	8%	+8%	+30%	44%	−14%	−9%
FWL.4	The activities and plans to meet the broad objectives and business strategy	83%	0%	−18%	69%	+5%	+5%
FWL.5	The conditions that must occur within the business that management believes must be present to meet the broad objectives and business strategy	20%	+5%	+15%	21%	−10%	−3%
FWL.6	The conditions that must occur in the external environment that management believes must be present to meet the broad objectives and business strategy	18%	−10%	+3%	25%	−15%	−9%
FWL.7	The comparison of actual business performance to previously disclosed opportunities, risks and plans of the company	18%	+20%	+13%	21%	+30%	+48%
FWL.8	New products launched in the next years	30%	+13%	+23%	44%	−6%	−9%
FWL.9	The expectations about the future growth of the company	53%	+10%	+20%	85%	+3%	+2%
FWL.10	The evolution of future macro-economic indicators (e.g. economic climate, exchange rates) and the effect on the company	13%	+23%	+23%	40%	−15%	−15%
FWL.11	The future production capacity of the company	18%	+18%	+33%	33%	+2%	0%

Category III: information about management and shareholders (MAN)

MAN.1	The directors and executive management	98%	0%	+2%	6%	+4%	+6%
MAN.2	The major shareholder(s) of the company's stock	88%	−8%	0%	48%	+19%	+4%
MAN.3	The number of shares owned by the directors, managers or employees	83%	−8%	−2%	15%	−3%	−6%
MAN.4	The director and executive management compensation	73%	+13%	+25%	4%	−1%	−1%
MAN.5	Transactions and relationships among stakeholders and the company	53%	+20%	+18%	50%	−6%	−8%
MAN.6	The disagreement with directors, auditors, bankers not associated with the company	5%	+5%	+3%	2%	−2%	0%

Category IV: background information about the company (BI)

BI.A	Broad objectives and strategy						
BI.1	The broad objectives of the company	83%	+5%	+15%	75%	−21%	−1%
BI.2	The broad strategies of the company	95%	+3%	+3%	92%	−24%	−12%
BI.3	The consistency or inconsistency of the strategy with key trends affecting the business	38%	−10%	+10%	42%	−23%	−25%
BI.B	Scope and description of business and properties						
BI.4	The industry in which the business participates	100%	−3%	0%	98%	+2%	0%
BI.5	The general development of the business	78%	+3%	+5%	77%	+1%	+4%
BI.6	The principal products and services	95%	+5%	+5%	94%	−1%	+4%
BI.7	The principal markets and market segments	85%	+13%	+13%	92%	+3%	+4%
BI.8	The processes used to make and render principal products and services	35%	−3%	−3%	27%	−13%	−16%
BI.9	The seasonality and cyclicality of the company	20%	−5%	+10%	58%	−40%	−27%
BI.10	Existing laws that have an influence on the business	28%	0%	+18%	29%	−3%	+3%
BI.11	The macro-economic activity	40%	+8%	+18%	58%	−42%	−25%
BI.12	Major contractual relationships with customers and suppliers	50%	0%	−3%	60%	−15%	−21%
BI.13	The location and productive capacity of the company's principle plants	70%	+20%	+25%	58%	−1%	+2%
BI.C	Impact of industry structure on the company						
BI.14	The major suppliers of a company	5%	0%	+3%	17%	−16%	−11%

Table 2 (*continued*)

Column 1: information items		Column 2: annual reports 2001	Column 3: annual reports 2003 (change from 2001)	Column 4: annual reports 2005 (change from 2001)	Column 5: analyst reports 2002	Column 6: analyst reports 2004 (change from 2002)	Column 7: analyst reports 2006 (change from 2002)
		N=40	*N*=40	*N*=40	*N*=52	*N*=63	*N*=62
BI.15	The availability or scarcity of supply of products or services	3%	0%	0%	8%	+2%	−3%
BI.16	The relative bargaining power of suppliers	3%	+3%	0%	0%	+5%	+6%
BI.17	The dominant customers of the company	25%	+5%	+18%	25%	−1%	+1%
BI.18	The extent that the business is dispersed among its customers	33%	+5%	+15%	21%	+11%	+11%
BI.19	The relative bargaining power of customers	3%	−3%	+5%	2%	+11%	+21%
BI.20	The major competitors of a company	18%	0%	+5%	75%	−10%	−22%
BI.21	The intensity of the competition	53%	−13%	+5%	65%	−7%	−1%
BI.22	The competitive position	60%	+10%	+5%	67%	+3%	−8%
BI.23	The ability of new companies to enter the business	5%	+5%	+5%	17%	+2%	−4%
Category V: intellectual capital information (IC)							
IC.A	Human capital						
IC.1	Employee compensation	48%	+8%	−8%	27%	−9%	−22%
IC.2	The education and training programs of employees	40%	+8%	+18%	0%	+5%	+2%
IC.3	The level of expertise of employees	25%	+8%	+13%	4%	+9%	+7%

IC.4	Staff policy	38%	−13%	0%	0%	+3%	+2%
IC.5	Job rotation	15%	−15%	+3%	2%	−2%	−2%
IC.6	Employee satisfaction	10%	−3%	0%	0%	0%	+2%
IC.7	Management quality	0%	+3%	+18%	12%	−5%	+5%
IC.B	Internal structure						
IC.8	Company productivity	18%	+20%	+25%	13%	−1%	+3%
IC.9	Innovation (e.g. new products, new production processes)	88%	+5%	+8%	44%	+10%	+17%
IC.10	Important patents, trademarks or licenses	28%	+23%	+23%	23%	−4%	−7%
IC.11	Research and development programs	68%	+5%	+15%	17%	+2%	+8%
IC.12	The quality of products or services	33%	+35%	+48%	8%	+8%	+8%
IC.13	The organization structure	30%	0%	+8%	0%	+3%	+13%
IC.14	The technological know-how	35%	+25%	+50%	23%	−7%	+9%
IC.15	The time required to perform activities such as production, delivery of products, development of new products	8%	+5%	+15%	2%	+3%	+5%
IC.C	External structure						
IC.16	Evolution in the market share	38%	+15%	+18%	56%	−3%	−17%
IC.17	Main brands of the company	60%	+13%	+18%	27%	+14%	+33%
IC.18	Customer satisfaction or customer loyalty	15%	+10%	+20%	0%	+5%	+8%
IC.19	Realized acquisitions	58%	+18%	+18%	63%	−6%	+3%
IC.20	Distribution and delivery methods	68%	+5%	+5%	35%	+5%	−6%

For the multivariate analysis, the control variables included are the number of companies followed by the financial analyst (COM_i) and the years of experience of the financial analyst (EXP_i). The following model was estimated:

$$ACC_i = \beta_0 + \beta_1 COM_i + \beta_2 EXP_i + \beta_3 U\_CAT_i + e_i$$

where:

ACC_i the mean forecast accuracy of the firms followed by financial analyst i;
COM_i the number of companies followed by financial analyst i;
EXP_i the years of experience of financial analyst i;
U_CAT_i the use of non-financial information category CAT by financial analyst i.
e_i error term.

4. Research findings

4.1. Disclosure of voluntary non-financial information in annual reports

Table 2 (columns 2 to 4) shows the extent to which each of the 71 non-financial information items is mentioned in the annual reports. Column 2 provides the percentage of non-financial information items reported in the 2001 annual reports. Columns 3 and 4 compare the use of each information item in the 2003 and 2005 annual reports, respectively, in relationship to the 2001 annual reports. The research findings reveal that the items MAN.1 (the directors and executive management), BI.4 (the industry in which the business participates), and BI.6 (the principle markets and market segments), are disclosed in at least one annual report for each company. The results further show an increase in the reporting of intellectual capital information items such as the item IC.14 (technological know-how) increasing by 25% in 2003 and 50% in 2005 compared to 2001; and IC.12 (quality of the products or services), increasing by 35% in 2003 and 48% in 2005. In addition, the annual reports of 2003 and 2005 include more forward-looking information such as the item FWL.11 (future production capacity of the company) increasing by 18% in 2003 and 33% in 2005; FWL.2 (future opportunities of the company) increasing by 8% in 2003 and 33% in 2005; and FWL.1 (future risks of the company) increasing by 13% in 2003 and 55% in 2005. The latter result has to be interpreted with caution since Belgian companies were required, as of 2005, to disclose information about the risks of the company.

The descriptive statistics in Table 3 demonstrate that on average the 2001 annual report contains 40% of all non-financial information items. This percentage increases to 46% in 2003 and to 52% in 2005. These figures clearly highlight an increasing trend in the reporting of non-financial information over time. In particular, the enhanced reporting of the information categories IC.B (internal structure), FWL (forward-looking information), and IC.C (external structure) is noteworthy. Table 3 also shows that the information (sub) categories BI.A (broad objectives and strategy), MAN (information about management and shareholders), and BI.B (scope and description of business and properties) receive the most attention in the annual reports.

Table 3
Descriptive statistics of the disclosure of voluntary non-financial information in the annual reports 2001, 2003 and 2005 (N=40)

Category	Annual reports 2001				Annual reports 2003				Annual reports 2005				Changes	
	Mean	Min	Max	Standard deviation	Mean	Min	Max	Standard deviation	Mean	Min	Max	Standard deviation	2003 v 2001	2005 v 2001
D_TOT (71)*	40%	23%	65%	0.09	46%	14%	65%	0.10	52%	23%	69%	0.09	+6%	+12%
D_ANA (11)	35%	18%	64%	0.11	39%	18%	73%	0.15	42%	18%	73%	0.15	+4%	+7%
D_ANA.A (6)	50%	17%	83%	0.18	55%	17%	83%	0.20	58%	17%	100%	0.22	+5%	+8%
D_ANA.B (5)	16%	0%	40%	0.13	20%	0%	60%	0.18	23%	0%	60%	0.16	+4%	+7%
D_FWL (11)	31%	0%	73%	0.15	41%	0%	91%	0.18	52%	18%	91%	0.17	+10%	+21%
D_MAN (6)	66%	33%	100%	0.16	70%	17%	100%	0.17	74%	33%	100%	0.14	+4%	+8%
D_BI (23)	44%	17%	65%	0.11	46%	22%	65%	0.12	52%	26%	74%	0.10	+2%	+8%
D_BI.A (3)	72%	0%	100%	0.25	71%	0%	100%	0.22	81%	0%	100%	0.21	−1%	+9%
D_BI.B (10)	60%	30%	100%	0.16	64%	40%	90%	0.14	69%	50%	90%	0.11	+4%	+9%
D_BI.C (10)	21%	0%	50%	0.14	22%	0%	60%	0.15	27%	0%	60%	0.14	+1%	+6%
D_IC (20)	36%	5%	70%	0.13	45%	0%	65%	0.14	51%	5%	80%	0.15	+9%	+15%
D_IC.A (7)	25%	0%	57%	0.17	24%	0%	57%	0.19	31%	0%	86%	0.20	−1%	+6%
D_IC.B (8)	38%	0%	88%	0.21	53%	0%	88%	0.20	62%	13%	100%	0.19	+15%	+24%
D_IC.C (5)	48%	0%	80%	0.21	60%	0%	100%	0.24	63%	0%	100%	0.25	+12%	+15%

Notes: D_CAT: the disclosure of non-financial information category CAT, with CAT = TOT: "aggregate amount of non-financial information"; ANA: "management's analysis of financial and non-financial data"; ANA.A: "reasons for changes in the financial, operating and performance related data"; ANA.B: "the identity and past effect of key trends"; FWL: "forward-looking information"; MAN: "information about management and shareholders"; BI: "background information"; BI.A: "broad objectives and strategy"; BI.B: "scope and description of business and properties"; BI.C: "impact of industry structure on the company"; IC: "intellectual capital information"; IC.A: "human capital"; IC.B: "internal structure"; IC.C: "external structure"; * between parentheses the number of information items belonging to each non-financial information category.

We apply the non-parametric, Friedman F-test to test the statistical significance of the increased disclosure of voluntary non-financial information. The research findings related to this test are presented in Table 4 and show that listed Belgian companies report a significantly varying amount of non-financial information (D_TOT) in at least one period. The increasing trend in the rank figures suggests that Hypothesis 1 is not rejected. It also appears that firms report significantly more non-financial information in at least one period for the information categories FWL (forward-looking information), BI (background information), IC (intellectual capital information), and all the sub-categories of BI and IC, except the category IC.A (human capital). The remaining information categories MAN (information about the management and shareholders) and ANA (management's analysis of financial and non-financial data) show a significant increase only at the 10% level.

Additionally, we use the Wilcoxon rank test for a pair-wise (between 2 years) research on the change in the disclosure of non-financial information. The results, in Table 5, show that the aggregate amount of non-financial information (D_TOT) increased significantly from 2001 to 2003 and from 2003 to 2005. In each pair-wise analysis, corporate managers disclose more information of the categories FWL (forward-looking information), and IC (intellectual capital information), especially the sub-category IC.B (internal structure). The 2005 annual reports contain significantly more non-financial information in every information category compared to the annual reports 2001. So these findings support Hypothesis 1.

4.2. The use of voluntary non-financial information by financial analysts

Column 5 of Table 2 shows how often each of the 71 information items are noted in the analyst reports of 2002. Columns 6 and 7 demonstrate the change in the amount of non-financial information mentioned in the analyst reports from 2002 to 2004 and from 2002 to 2006. Table 2 also shows that nearly every financial analyst mentions item BI.4 (the industry in which the business participates). The descriptive statistics further show that financial analysts discuss items BI.6 (the principal products and services); and BI.7 (the principal market and market segments), in more than 90% of their reports. Inconsistent with our assumptions, some information items are included in fewer analysts' reports over time, such as the items BI.2 (the broad strategies of the company) decreasing by 24% in 2004 and 12% in 2006; BI.3 (the (in)consistency of the strategy with the key trends affecting the business) decreasing by 23% in 2004 and 25% in 2006, and BI.1 (the broad objectives of the company) decreasing by 21% in 2004 and 1% in 2006. The decline in the frequency of information about objectives and strategy is remarkable since nearly all annual reports contain such information. Large decreases are also shown for item BI.9 (the seasonality and cyclicality of the company) decreasing by 40% in 2004 and 27% in 2006. Non-financial information items discussed in an increasing number of analyst reports include, for instance, the item FWL.7 (the comparison of actual business performance to previously disclosed opportunities, risks and plans of the company); IC.17 (the main brands of the company); and IC.9 (innovation).

Table 6 provides descriptive statistics of the use of non-financial information provided in the analyst reports over time. As Table 6 shows, the amount of voluntary non-financial information (U_TOT) included in analyst reports remains stable over the three periods. On

Table 4
Results of the non-parametric Friedman test on the disclosure of voluntary non-financial information in annual reports during three years ($N=40$)

Category	Year	Rank	Chi square	Significance level
D_TOT	2001	1.350	39.636	0.000
	2003	1.925		
	2005	2.725		
D_ANA	2001	1.750	4.864	0.088
	2003	2.100		
	2005	2.150		
D_ANA.A	2001	1.850	1.832	0.400
	2003	2.063		
	2005	2.088		
D_ANA.B	2001	1.850	2.939	0.230
	2003	2.000		
	2005	2.150		
D_FWL	2001	1.513	24.014	0.000
	2003	1.938		
	2005	2.550		
D_MAN	2001	1.800	5.691	0.058
	2003	1.963		
	2005	2.238		
D_BI	2001	1.675	12.556	0.002
	2003	1.900		
	2005	2.425		
D_BI.A	2001	1.888	6.343	0.042
	2003	1.850		
	2005	2.263		
D_BI.B	2001	1.713	11.824	0.003
	2003	1.913		
	2005	2.375		
D_BI.C	2001	1.813	6.016	0.049
	2003	1.913		
	2005	2.275		
D_IC	2001	1.463	23.700	0.000
	2003	2.063		
	2005	2.475		
D_IC.A	2001	1.913	2.492	0.288
	2003	1.913		
	2005	2.175		
D_IC.B	2001	1.463	24.111	0.000
	2003	2.125		
	2005	2.413		
D_IC.C	2001	1.613	12.738	0.002
	2003	2.100		
	2005	2.288		

Notes: D_CAT: the disclosure of non-financial information category CAT, with CAT = TOT: "aggregate amount of non-financial information"; ANA: "management's analysis of financial and non-financial data"; ANA.A: "reasons for changes in the financial, operating and performance related data"; ANA.B: "the identity and past effect of key trends"; FWL: "forward-looking information"; MAN: "information about management and shareholders"; BI: "background information"; BI.A: "broad objectives and strategy"; BI.B: "scope and description of business and properties"; BI.C: "impact of industry structure on the company"; IC: "intellectual capital information"; IC.A: "human capital"; IC.B: "internal structure"; IC.C: "external structure".

Table 5
Results of the non-parametric Wilcoxon ranks test on the disclosure of voluntary non-financial information in annual reports during 2 years

Category		Comparison 2003–2001			Comparison 2005–2003			Comparison 2005–2001		
		Number AR	Mean rank	z-value	Number AR	Mean rank	z-value	Number AR	Mean rank	z-value
D_TOT	−	9	12.94	−3.690***	6	14.92	−4.081***	3	12.00	−4.854***
	+	29	21.53		32	20.36		35	20.14	
	=	2			2			2		
D_ANA	−	8	14.81	−1.727**	15	15.57	−0.857	10	9.60	−2.662***
	+	19	13.66		18	18.19		19	17.84	
	=	13			7			11		
D_ANA.A	−	10	12.30	−1.374*	14	13.54	−0.625	11	11.09	−1.918**
	+	16	14.25		15	16.37		17	16.71	
	=	14			11			12		
D_ANA.B	−	9	10.17	−1.204	8	10.25	−0.927	8	10.94	−1.883**
	+	13	12.42		12	10.67		16	13.28	
	=	18			20			16		
D_FWL	−	11	13.50	−2.764***	8	15.75	−2.967***	5	10.90	−4.406***
	+	24	20.06		26	18.04		31	19.73	
	=	5			6			4		
D_MAN	−	10	9.70	−1.288*	11	13.27	−1.394*	6	10.50	−2.857***
	+	13	13.77		17	15.29		19	13.79	
	=	17			12			15		
D_BI	−	14	18.04	−1.530*	10	14.85	−3.097***	10	9.60	−3.883***
	+	23	19.59		27	20.54		27	22.48	
	=	3			3			3		
D_BI.A	−	11	12.00	−0.200	6	12.50	−2.449***	8	12.00	−1.980**
	+	11	11.00		18	12.50		17	13.47	
	=	18			16			15		
D_BI.B	−	12	13.83	−1.401*	8	15.25	−2.122**	7	13.00	−3.138***
	+	18	16.61		21	14.90		24	16.88	
	=	10			11			9		
D_BI.C	−	13	16.31	−0.432	9	12.44	−2.378***	10	13.20	−2.332***
	+	17	14.88		20	16.15		21	17.33	
	=	10			11			9		
D_IC	−	7	10.43	−3.732***	9	11.89	−2.956***	6	9.25	−4.371***
	+	26	18.77		23	18.30		30	20.35	
	=	7			8			4		
D_IC.A	−	13	12.35	−0.323	12	9.67	−2.244**	10	14.00	−1.706**
	+	11	12.68		17	18.76		19	15.53	
	=	16			11			11		
D_IC.B	−	5	6.50	−3.813***	11	10.45	−2.284**	4	7.13	−4.635***
	+	22	15.70		18	17.78		30	18.88	
	=	13			11			6		
D_IC.C	−	8	12.56	−2.593***	10	12.85	−0.952	7	13.50	−3.303***
	+	21	15.93		15	13.10		25	17.34	
	=	11			15			8		

average, 33% to 35% of all the non-financial information items are discussed over time in each year (2002, 2004 and 2006). The frequency with which certain non-financial information categories are mentioned in the three periods evolves as well. For example, analysts provide less information for the categories BI.A (broad objectives and strategy) decreasing by 23% in 2004 and 12% in 2006; and BI.B (scope and description of business and properties) decreasing by 11% in 2004 and 7% in 2006. In contrast they mention more non-financial information for the information categories ANA.A (management's analysis of financial and non-financial data) increasing by 5% in 2004 and 9% in 2006; and IC.B, (internal structure) increasing by 2% in 2004 and 7% in 2006. The remaining categories demonstrate a limited evolution over time.

   Table 6 shows further that the items in category BI are often discussed in the analyst reports, despite an overall decrease in mentioning this category in 2004 and 2006. Each analyst report discusses about one half of the information items belonging to this category. The category FWL appears to be important as well, with almost one half of the information items appearing in each analyst report. On the other hand, financial analysts only occasionally discuss the category IC although Table 6 shows a moderate increase in the number of times these items are mentioned in the analyst reports. The table also shows that only a low amount of human capital information (category IC.A) is provided in the analyst reports which drives our finding that intellectual capital information as a whole is only moderately used. We also show that the analyst reports contain a limited amount of information items belonging to the category MAN (around 21% in the three periods).

   In order to compare the quantity of voluntary non-financial information mentioned in the analyst reports over time, only those analyst reports issued for the same company by the same financial analyst operating at the same brokerage firm in all periods, are included for further analysis resulting in 30 paired analyst reports. The average amount of voluntary non-financial information is somewhat larger in this paired sample compared to the full sample. This finding is consistent with the results of Flöstrand and Ström (2006). To examine the significance of the changes in the frequency with which non-financial information is included in analyst reports, we apply the Friedman test to the limited sample of 30 analyst reports. The research findings, in Table 7, do not show a significant difference in any one of the three periods analyzed, suggesting that Hypothesis 2 is not supported. The research results in Table 7 further reveal a significant difference in the amount of information mentioned for information category BI and its sub-categories BI.A and BI.B. As previously discussed, financial analysts mention a larger number of items in the 2002

Notes to Table 5:
D_CAT: the disclosure of non-financial information category CAT, with CAT = TOT: "aggregate amount of non-financial information"; ANA: "management's analysis of financial and non-financial data"; ANA.A: "reasons for changes in the financial, operating and performance related data"; ANA.B: "the identity and past effect of key trends"; FWL: "forward-looking information"; MAN: "information about management and shareholders"; BI: "background information"; BI.A: "broad objectives and strategy"; BI.B: "scope and description of business and properties"; BI.C: "impact of industry structure on the company" IC: "intellectual capital information" IC.A: "human capital"; IC.B: "internal structure"; IC.C: "external structure"; number AR: the number of annual reports showing a decrease (−), an increase (+) or no evolution (=) between the periods analyzed; ***significant at a 1% level; **significant at a 5% level; *significant at a 10% level.

Table 6

Descriptive statistics of the use of voluntary non-financial information in the analyst reports 2002, 2004 and 2006 (full sample $N=52$ in 2002; $N=63$ in 2004 and $N=62$ in 2005)

Category	Analyst reports 2002				Analyst reports 2004				Analyst reports 2006				Changes	
	Mean	Min	Max	Standard deviation	Mean	Min	Max	Standard deviation	Mean	Min	Max	Standard deviation	2004 v 2002	2006 v 2002
U_TOT (71)*	35%	14%	52%	0.09	33%	15%	61%	0.10	35%	17%	54%	0.09	−2%	0%
U_ANA (11)	30%	0%	45%	0.12	31%	0%	55%	0.12	33%	9%	55%	0.11	+1%	+3%
U_ANA.A (6)	40%	0%	83%	0.18	45%	0%	83%	0.19	49%	17%	83%	0.16	+5%	+9%
U_ANA.B (5)	17%	0%	60%	0.16	14%	0%	60%	0.15	13%	0%	60%	0.16	−3%	−4%
U_FWL (11)	48%	18%	82%	0.16	48%	18%	82%	0.15	51%	18%	82%	0.15	0%	+3%
U_MAN (6)	21%	0%	50%	0.16	23%	0%	50%	0.15	20%	0%	67%	0.16	+2%	−1%
U_BI (23)	50%	9%	74%	0.14	43%	13%	78%	0.14	45%	22%	78%	0.14	−7%	−5%
U_BI.A (3)	70%	0%	100%	0.28	47%	0%	100%	0.31	58%	0%	100%	0.27	−23%	−12%
U_BI.B (10)	65%	20%	100%	0.16	54%	20%	100%	0.16	58%	30%	100%	0.15	−11%	−7%
U_BI.C (10)	30%	0%	70%	0.17	30%	0%	70%	0.18	29%	0%	90%	0.19	0%	−1%
U_IC (20)	18%	0%	40%	0.10	19%	0%	55%	0.11	21%	0%	50%	0.10	+1%	+3%
U_IC.A (7)	6%	0%	29%	0.09	6%	0%	43%	0.10	5%	0%	29%	0.08	0%	−1%
U_IC.B (8)	16%	0%	63%	0.15	18%	0%	75%	0.17	23%	0%	63%	0.18	+2%	+7%
U_IC.C (5)	36%	0%	80%	0.22	39%	0%	80%	0.24	40%	0%	100%	0.24	+3%	+4%

Notes: U_CAT: the use of non-financial information category CAT, with CAT = TOT: "aggregate amount of non-financial information"; ANA: "management's analysis of financial and non-financial data"; ANA.A: "reasons for changes in the financial, operating and performance related data"; ANA.B: "the identity and past effect of key trends"; FWL: "forward-looking information"; MAN: "information about management and shareholders"; BI: "background information"; BI.A: "broad objectives and strategy"; BI.B: "scope and description of business and properties"; BI.C: "impact of industry structure on the company"; IC: "intellectual capital information"; IC.A: "human capital"; IC.B: "internal structure"; IC.C: "external structure"; * between parentheses the number of information items belonging to each non-financial information category.

Table 7
Results of the non-parametric Friedman test on the use of voluntary non-financial information in analyst reports during three years ($N=30$)

Category	Year	Rank	Chi square	Significance level
U_TOT	2002	2.217	3.774	0.152
	2004	1.733		
	2006	2.050		
U_ANA	2002	1.983	0.064	0.969
	2004	1.983		
	2006	2.033		
U_ANA.A	2002	1.850	2.116	0.347
	2004	2.167		
	2006	1.983		
U_ANA.B	2002	2.117	1.000	0.607
	2004	1.917		
	2006	1.967		
U_FWL	2002	1.917	7.458	0.024
	2004	1.717		
	2006	2.367		
U_MAN	2002	2.033	0.644	0.725
	2004	2.067		
	2006	1.900		
U_BI	2002	2.483	12.056	0.002
	2004	1.683		
	2006	1.833		
U_BI.A	2002	2.317	6.473	0.039
	2004	1.750		
	2006	1.933		
U_BI.B	2002	2.483	14.168	0.001
	2004	1.650		
	2006	1.867		
U_BI.C	2002	2.200	2.154	0.341
	2004	1.867		
	2006	1.933		
U_IC	2002	1.883	1.691	0.429
	2004	1.933		
	2006	2.183		
U_IC.A	2002	2.083	3.085	0.214
	2004	2.100		
	2006	1.817		
U_IC.B	2002	1.883	3.449	0.178
	2004	1.867		
	2006	2.250		
U_IC.C	2002	1.900	1.089	0.580
	2004	2.117		
	2006	1.983		

Notes: U_CAT: the use of non-financial information category CAT, with CAT = TOT: "aggregate amount of non-financial information"; ANA: "management's analysis of financial and non-financial data"; ANA.A: "reasons for changes in the financial, operating and performance related data"; ANA.B: "the identity and past effect of key trends"; FWL: "forward-looking information"; MAN: "information about management and shareholders"; BI: "background information"; BI.A: "broad objectives and strategy"; BI.B: "scope and description of business and properties"; BI.C: "impact of industry structure on the company"; IC: "intellectual capital information"; IC.A: "human capital"; IC.B: "internal structure"; IC.C: "external structure".

Table 8
Results of the non-parametric Wilcoxon rank test on the use of voluntary non-financial information in analyst reports during 2 years

Category		Comparison 2004–2002			Comparison 2006–2004			Comparison 2006–2004		
		Number AR	Mean rank	z-value	Number AR	Mean rank	z-value	Number AR	Mean rank	z-value
U_TOT	−	24	18.04	−1.934**	20	19.88	−0.676	15	16.63	−0.029
	+	11	17.91		22	22.98		16	15.41	
	=	0			2			3		
U_ANA	−	12	12.67	−0.613	18	16.28	−0.080	11	12.32	−0.740
	+	14	14.21		16	18.88		14	13.54	
	=	9			10			9		
U_ANA.A	−	8	11.81	−1.369*	19	14.26	−0.176	8	10.06	−1.528*
	+	15	12.10		14	20.71		14	12.32	
	=	12			11			12		
U_ANA.B	−	11	10.59	−0.920	12	11.88	−0.144	14	10.14	−0.520
	+	8	9.19		11	12.14		8	13.88	
	=	16			21			12		
U_FWL	−	18	15.44	−0.948	15	20.60	−1.604**	8	15.31	−1.093
	+	12	15.58		26	21.23		17	11.91	
	=	5			3			9		
U_MAN	−	12	11.17	−0.126	20	14.20	−1.121	14	14.54	−0.747
	+	11	12.91		10	18.10		12	12.29	
	=	12			14			8		
U_BI	−	26	16.81	−3.248***	18	19.75	−0.483	21	14.43	−2.287**
	+	6	15.17		21	20.21		7	14.71	
	=	3			5			6		
U_BI.A	−	19	13.00	−2.877***	12	15.21	−1.582*	18	15.11	−1.687**
	+	5	10.60		20	17.28		10	13.40	
	=	11			12			6		
U_BI.B	−	24	14.60	−3.404***	12	13.79	−0.869*	20	13.68	−2.060**
	+	4	13.88		16	15.03		7	14.93	
	=	7			16			7		
U_BI.C	−	18	15.00	−1.541*	19	16.95	−0.755	17	15.41	−0.973
	+	10	13.60		14	17.07		12	14.42	
	=	7			11			5		
U_IC	−	15	16.77	−0.069	19	18.71	−0.742	11	15.45	−1.043
	+	16	15.28		21	22.12		18	14.72	
	=	4			4			5		
U_IC.A	−	8	8.50	0.000	14	10.93	−1.966**	8	5.00	−1.387*
	+	8	8.50		6	9.50		2	7.50	
	=	19			24			24		
U_IC.B	−	14	16.14	−0.910	11	12.91	−1.889**	9	11.50	−1.866**
	+	13	11.69		19	17.00		17	14.56	
	=	8			14			8		
U_IC.C	−	7	13.57	−0.735	15	15.20	−0.240	11	9.82	−0.269
	+	14	9.71		14	14.79		10	12.30	
	=	14			15			13		

analyst reports compared to the analyst reports for the remaining periods. A significant increase in the information category FWL is noted in analyst reports issued in 2006.

We also perform a pair-wise analysis of the various two-year periods in order to observe possible changes. The Wilcoxon rank test is applied to a limited number of analyst reports selected by the same criteria as discussed above. This limitation results in a sample size of 35 paired cases between 2002 and 2004, 44 cases between 2004 and 2006 and 34 cases between 2002 and 2006. The results, in Table 8, show that the total amount of non-financial information in analyst reports significantly declines between the period 2002 and 2004. This decrease is especially noticeable in the information categories BI and the sub-categories BI.A and BI.B. The 2006 analyst reports show an increase in these information categories compared to the 2004 analyst reports. We also note a lower amount of human capital information in the 2006 analyst reports compared to the 2004 analyst reports. A significant increase in the reporting of forward-looking information in the period 2006 compared to the previous periods is consistent with the hypothesis. In addition, the 2006 analyst reports contain a larger number of items from category IC.B (internal structure).

Although two information categories show a significant increase in use in the analyst reports, the general trend is that financial analysts do not include much more non-financial information items in their reports over time. Therefore, with the exception of the information categories FWL and IC.B, our results do not support Hypothesis 2.

4.3. The comparison between corporate managers and financial analysts

Comparing Tables 3 and 5, shows that annual reports include more non-financial information than analyst reports, a consistent finding of García-Meca (2005). This finding, however, is expected because companies have to respond to multiple stakeholders (Bowen, DuCharme, & Shores, 1995; Moneva and Llena, 2000). Firms also report some information in order to enhance stock prices and or to reduce the cost of capital (Garcia-Meca, 2005). Rogers and Grant (1997) further mention that financial analysts do not mention all available information in their analyst reports. In particular, they tend to avoid including information they consider less reliable (e.g., human capital information).

By examining the mean scores for each information category separately (Tables 3 and 5), we see that analyst reports issued in 2002 discuss more information of the non-financial information (sub)categories ANA.B, FWL, BI, and its sub-categories BI.B and BI.C. Annual

---

Notes to Table 8:
U_CAT: the use of non-financial information category CAT, with CAT = TOT: "aggregate amount of non-financial information"; ANA: "management's analysis of financial and non-financial data"; ANA.A: "reasons for changes in the financial, operating and performance related data"; ANA.B: "the identity and past effect of key trends"; FWL: "forward-looking information"; MAN: "information about management and shareholders"; BI: "background information"; BI.A: "broad objectives and strategy"; BI.B: "scope and description of business and properties"; BI.C: "impact of industry structure on the company"; IC: "intellectual capital information"; IC.A: "human capital"; IC.B: "internal structure"; IC.C: "external structure"; number AR: the number of analyst reports showing a decrease (−), an increase (+) or no evolution (=) between the periods analyzed; ***significant at a 1% level; **significant at a 5% level; *significant at a 10% level.

reports of 2001 contain more information of the remaining non-financial information categories. When comparing the content of annual reports of 2003 with analyst reports issued in 2004, we see that financial analysts only include more information for the non-financial information categories FWL and BI.C in their reports. The 2006 analyst reports mention more information only for the category BI.C.

The Mann–Whitney *U* test comparing the amount of non-financial information presented in annual reports and analyst reports confirm our descriptive findings. So, Table 9 documents a significant difference (10%) in 2002 with respect to the aggregate disclosure and use of voluntary non-financial information, suggesting that corporate managers are discussing a little more voluntary non-financial information in their reports. However, analyst reports provide significantly more information for the categories FWL, BI, and the sub-categories BI.B and BI.C. Annual reports, on the other hand, discuss significantly more information for the categories ANA, ANA.A, MAN, IC, and each of the IC sub-categories. The statistical results show no significant difference in the disclosure and usage of the information sub-categories ANA.B and BI.A.

For the period 2006, Table 9 demonstrates that corporate managers also increased reporting in categories FWL and BI.C, since investors can find the same amount of this information in annual reports as in analyst reports. With regard to the remaining information categories, Table 9 shows that the 2005 annual reports contain significantly more non-financial information than the 2006 analyst reports.

Our research confirms our expectations. Consistent with Hypothesis 3, companies have improved their reporting in those categories that financial analysts were using more often in 2002, i.e., the information categories FWL, BI, BI.B, and BI.C.

4.4. The use of voluntary non-financial information and the accuracy of forecasts

In the second stage, a questionnaire, which included the same non-financial information items as the disclosure index applied in the content-analysis method, was sent to the same population of financial analysts. The extent to which each of the 31 respondents relies on voluntary non-financial information for each information category and a summary of statistics about control variables are presented in Table 10.[4] On average, our respondents follow 8 companies (ranging from two to 15 companies). The respondents reported having about 7.5 years of experience.

The scores regarding the use of non-financial information range from zero (never used) to four (always used). The average score for our research analysts is 2.46, indicating that they "sometimes to often" rely on voluntary non-financial information. Table 10 also shows large differences in use, depending on the non-financial information category. Financial analysts are most concerned with items in the sub-category BI.A (broad objectives and strategy). An average score of 3.23 denotes that analysts "often to always" use the items in this information category. The category FWL (forward-looking information) is the second most important information category, with an average value of 2.99 which shows that financial analysts "often" rely on forward-looking information. Our research also shows

---

[4] The survey findings for each individual information item can be obtained from the authors.

Table 9
Results of the Mann–Whitney U test on the comparison between the disclosure and the use of voluntary non-financial information

Category		2002		2004		2006	
		Mean rank	z-value	Mean rank	z-value	Mean rank	z-value
DU_TOT	Annual reports	47.71	−1.920*	70.29	−5.480***	74.05	−6.728***
	Analyst reports	37.26		37.51		34.14	
DU_ANA	Annual reports	46.91	−1.748*	59.65	−2.789***	58.64	−2.801***
	Analyst reports	37.70		43.25		42.34	
DU_ANA.A	Annual reports	48.66	−2.281**	57.50	−2.258**	56.36	−2.234**
	Analyst reports	36.73		44.41		43.55	
DU_ANA.B	Annual reports	40.14	−0.267	56.99	−2.211**	57.53	−2.661***
	Analyst reports	41.48		44.69		42.93	
DU_FWL	Annual reports	25.69	−4.432***	42.06	−1.818*	50.35	−0.620
	Analyst reports	49.54		52.75		46.75	
DU_MAN	Annual reports	65.71	−7.170***	79.97	−8.099***	78.41	−7.983***
	Analyst reports	27.22		32.29		31.81	
DU_BI	Annual reports	33.29	−2.220**	55.18	−1.599	59.44	−2.967***
	Analyst reports	45.30		45.67		41.91	
DU_BI.A	Annual reports	41.36	−0.112	62.41	−3.710***	62.89	−4.172***
	Analyst reports	40.80		41.76		40.07	
DU_BI.B	Annual reports	34.81	−1.810*	61.01	−3.157***	62.71	−3.873***
	Analyst reports	44.45		42.52		40.17	
DU_BI.C	Annual reports	31.98	−2.613***	40.03	−2.343**	47.89	−0.028
	Analyst reports	46.03		53.84		48.06	
DU_IC	Annual reports	58.36	−4.999***	74.79	−6.658***	75.00	−7.007***
	Analyst reports	31.32		35.08		33.63	
DU_IC.A	Annual reports	55.72	−4.543***	67.03	−5.006***	70.23	−6.189***
	Analyst reports	32.79		39.27		36.17	
DU_IC.B	Annual reports	54.81	−4.040***	73.54	−6.398***	74.20	−6.826***
	Analyst reports	33.30		35.75		34.06	
DU_IC.C	Annual reports	48.55	−2.225**	63.34	−3.784***	65.29	−4.561***
	Analyst reports	36.79		41.26		38.80	

Notes: DU_CAT: the disclosure/use of non-financial information category CAT, with CAT = TOT: "aggregate amount of non-financial information"; ANA: "management's analysis of financial and non-financial data"; ANA. A: "reasons for changes in the financial, operating and performance related data"; ANA.B: "the identity and past effect of key trends"; FWL: "forward-looking information"; MAN: "information about management and shareholders"; BI: "background information"; BI.A: "broad objectives and strategy"; BI.B: "scope and description of business and properties"; BI.C: "impact of industry structure on the company"; IC: "intellectual capital information"; IC.A: "human capital"; IC.B: "internal structure"; IC.C: "external structure"; ***significant at a 1% level; **significant at a 5% level; *significant at a 10% level.

that financial analysts use the information categories ANA.A (reasons for changes in the financial, operating and performance related data), BI.B (scope and description of business and properties) and BI.C (impact of industry structure on the company) to a large degree.

Conversely, we find that financial analysts rarely use information from the category IC. A (human capital). An average score of 1.39 indicates that the items in this information category are "rarely to sometimes" used, but they occasionally use the information category MAN (information about management and shareholders) which has an average score of 1.91.

Table 10
Descriptive statistics of the dependent and independent variables based on the survey method

Variables	Mean	Min	Max	SD
ACC_i	0.61	0.06	3.91	0.88
COM_i	8.23	2	15	3.73
EXP_i	7.45	1	26	4.88
U_TOT_i	2.46	1.06	3.77	0.56
U_ANA_i	2.39	1.27	3.64	0.61
$U\_ANA.A_i$	2.82	1.50	4.00	0.69
$U\_ANA.B_i$	1.87	0.60	3.20	0.68
U_FWL_i	2.99	1.55	4.00	0.66
U_MAN_i	1.91	0.17	4.00	0.90
U_BI_i	2.88	0.60	4.40	0.88
$U\_BI.A_i$	3.23	1.00	4.00	0.83
$U\_BI.B_i$	2.76	1.00	4.00	0.83
$U\_BI.C_i$	2.76	1.20	4.00	0.71
U_IC_i	1.91	0.65	3.45	0.52
$U\_IC.A_i$	1.39	0.29	3.71	0.60
$U\_IC.B_i$	2.04	0.50	3.25	0.61
$U\_IC.C_i$	2.45	1.40	3.80	0.60

Notes: This table provides the descriptive statistics for the variables ACC_i: the mean forecast accuracy (measured as the absolute difference between the forecasted and the actual EPS scaled by the actual EPS) of the companies followed by financial analyst i; COM_i: the number of companies followed by financial analyst i; EXP_i: the years of experience of financial analyst i; U_CAT_i: the use of non-financial information category CAT by financial analyst i, with CAT = TOT: "aggregate amount of non-financial information"; ANA: "management's analysis of financial and non-financial data"; ANA.A: "reasons for changes in the financial, operating and performance related data"; ANA.B: "the identity and past effect of key trends"; FWL: "forward-looking information"; MAN: "Information about management and shareholders"; BI: "background information"; BI.A: "broad objectives and strategy"; BI.B: "scope and description of business and properties"; BI.C: "Impact of industry structure on the company"; IC: "intellectual capital information"; IC.A: "human capital"; IC.B: "internal structure"; IC.C: "external structure"; U_CAT_i is measured based on a Likert scale ranged as follows zero = never used; one = rarely used; two = sometimes used; three = often used; four = always used.

The survey results are comparable to the content analysis of the analyst reports.[5] In both analyses the categories ANA.A, FWL, BI.A, and BI.B are seen as most important, while the categories ANA.B, MAN, and IC.A are seen as least important. The two research methods show differences however. For instance, the item IC.18 (customer satisfaction) is almost "never" discussed in the analyst reports, whereas the survey results document that financial analysts "sometimes" use this item. This finding illustrates that financial analysts do employ some non-financial information items, even when they do not discuss them in their reports.

To determine whether or not forecast accuracy is influenced by the use of non-financial information, we perform univariate correlation analyses on the data we collect by the survey

---

[5] The comparison between the content of analyst reports and the survey results is first conducted on a limited sample that only contains the respondents to the questionnaire for whom analyst reports are analyzed. The sample consists of 15 respondents of the survey and 40 analyst reports. Second, the results of the 31 respondents to the survey and the content analysis of the 62 analyst reports are compared with each other as well. The research findings of both analyses–the comparison conducted on the full sample and on the limited sample–are similar, indicating that no biases exist which can be attributed to the difference in the samples.

method. These results in Table 11 demonstrate an insignificant correlation coefficient between the aggregate use of more non-financial information and accurate forecasts. Thus, Hypothesis 4 is not supported. Although the use of various non-financial information categories is positively related to the analysts' forecast accuracy, this association is only significant with respect to the categories FWL (forward-looking information) and IC.B (internal structure). For all the remaining information categories, Hypothesis 4 is not supported.

We also note that financial analysts who follow more companies forecast less accurately than those with fewer companies, which is consistent with earlier studies (Jacob et al., 1999; Clement & Tse, 2003). Furthermore, as in Jacob et al. (1999), length of experience does not influence the analysts' forecast accuracy.

We also estimate a regression model with the dependent variable being the ranking of raw data. The results, presented in Table 12, confirm the univariate research statistics in Table 11: analysts assessing fewer companies perform better, and analysts with more years of experience do not necessarily make more accurate forecasts. Our multivariate regression results show,

Table 11
Univariate correlation statistics between the analysts' forecast accuracy and the analyst-specific characteristics based on the survey method

	Pearson correlation			Spearmans' rho correlation		
	ACC_i	COM_i	EXP_i	ACC_i	COM_i	EXP_i
ACC_i	1.000	0.473***	0.175	1.000	0.328*	0.164
COM_i	0.473***	1.000	0.226	0.328*	1.000	0.327*
EXP_i	0.175	0.226	1.000	0.164	0.327*	1.000
U_TOT_i	−0.146	0.234	0.042	−0.142	0.262	−0.057
U_ANA_i	−0.096	0.119	0.080	−0.077	0.101	−0.059
$U\_ANA.A_i$	−0.129	0.146	0.142	−0.037	0.177	0.058
$U\_ANA.B_i$	−0.032	0.053	−0.022	−0.044	0.059	−0.154
U_FWL_i	−0.393**	0.108	−0.108	−0.392**	0.191	−0.265
U_MAN_i	0.189	0.398**	0.019	0.097	0.317*	0.004
U_BI_i	−0.128	0.240	0.061	−0.190	0.213	−0.020
$U\_BI.A_i$	−0.069	0.296	0.068	−0.133	0.295	−0.009
$U\_BI.B_i$	0.009	0.322*	0.099	−0.154	0.294	−0.025
$U\_BI.C_i$	−0.236	0.087	0.014	−0.181	0.214	0.017
U_IC_i	−0.141	0.174	0.033	−0.037	0.069	−0.073
$U\_IC.A_i$	−0.024	0.148	0.060	0.151	0.039	0.002
$U\_IC.B_i$	−0.332**	0.180	0.063	−0.318**	0.137	−0.044
$U\_IC.C_i$	−0.097	0.130	−0.027	−0.131	0.123	−0.107

Notes: This table provides the Pearson correlations and the Spearman's rho correlations for the variables ACC_i: the mean forecast accuracy (measured as the absolute difference between the forecasted and the actual EPS scaled by the actual EPS) of the companies followed by financial analyst i; COM_i: the number of companies followed by financial analyst i; EXP_i: the years of experience of financial analyst i; U_CAT_i: the use of non-financial information category CAT by financial analyst i, with CAT = TOT: "aggregate amount of non-financial information"; ANA: "management's analysis of financial and non-financial data"; ANA.A: "reasons for changes in the financial, operating and performance related data"; ANA.B: "the identity and past effect of key trends"; FWL: "forward-looking information"; MAN: "information about management and shareholders"; BI: "background information"; BI.A: "broad objectives and strategy"; BI.B: "scope and description of business and properties"; BI.C: "impact of industry structure on the company"; IC: "intellectual capital information"; IC.A: "human capital"; IC.B: "internal structure"; IC.C: "external structure"; ***significant at a 1% level; **significant at a 5% level; *significant at a 10% level.

Table 12
Multivariate regression statistics between the analysts' forecast accuracy and the analyst-specific characteristics based on the survey method

Variables	Bèta coefficient	*t*-value	Significance level variable	*F*-value model	*p*-value model	R^2
Intercept	0.702	1.145	0.262	3.820	**0.021****	29.8
COM$_i$	0.115	3.063	**0.005*****			
EXP$_i$	0.012	0.415	0.682			
U_TOT$_i$	−0.394	−1.631	0.114			
Intercept	0.319	0.531	0.600	3.052	**0.046****	25.3
COM$_i$	0.105	2.760	**0.010*****			
EXP$_i$	0.013	0.470	0.642			
U_ANA$_i$	−0.215	−0.940	0.356			
Intercept	0.519	0.845	0.406	3.388	**0.032****	27.3
COM$_i$	0.107	2.851	**0.008*****			
EXP$_i$	0.016	0.554	0.584			
U_ANA.A$_i$	−0.266	−1.289	0.208			
Intercept	−0.038	−0.077	0.939	2.715	0.065*	23.2
COM$_i$	0.102	2.654	**0.013****			
EXP$_i$	0.012	0.402	0.691			
U_ANA.B$_i$	−0.065	−0.322	0.750			
Intercept	1.000	1.793	0.084	5.270	**0.005*****	36.9
COM$_i$	0.118	3.332	**0.003*****			
EXP$_i$	0.009	0.33	0.742			
U_FWL$_i$	−0.434	−2.453	**0.021****			
Intercept	−0.165	−0.415	0.681	2.671	0.068*	22.9
COM	0.100	2.394	**0.024****			
EXP	0.012	0.414	0.682			
U_MAN$_i$	0.006	0.038	0.970			
Intercept	0.653	1.070	0.294	3.709	**0.024****	29.2
COM$_i$	0.115	0.005	**0.005*****			
EXP$_i$	0.012	0.442	0.662			
U_BI$_i$	−0.328	−1.550	0.133			
Intercept	0.518	0.868	0.393	3.444	**0.031****	27.7
COM$_i$	0.116	2.990	**0.006*****			
EXP$_i$	0.012	0.428	0.672			
U_BI.A$_i$	−0.241	−1.338	0.192			
Intercept	0.290	0.497	0.623	3.035	**0.046****	25.2
COM$_i$	0.112	2.828	**0.009*****			
EXP$_i$	0.013	0.444	0.661			
U_BI.B$_i$	−0.192	−0.919	0.366			
Intercept	0.582	1.102	0.280	3.968	**0.018****	30.6
COM$_i$	0.106	2.916	**0.007*****			
EXP$_i$	0.012	0.425	0.674			
U_BI.C$_i$	−0.294	−1.733	0.094*			
Intercept	0.436	0.818	0.421	3.500	**0.029****	28.0
COM$_i$	0.110	2.923	**0.007*****			
EXP$_i$	0.012	0.417	0.680			
U_IC$_i$	−0.344	−1.386	0.177			
Intercept	0.001	0.001	1.000	2.814	0.058*	23.8
COM$_i$	0.104	2.704	**0.012*****			
EXP$_i$	0.012	0.430	0.670			
U_IC.A$_i$	−0.132	−0.576	0.569			

Table 12 (*continued*)

Variables	Bèta coefficient	*t*-value	Significance level variable	*F*-value model	*p*-value model	R^2
Intercept	0.619	1.276	0.213	4.509	**0.011****	33.4
COM$_i$	0.114	3.144	**0.004*****			
EXP$_i$	0.013	0.493	0.626			
U_IC.B$_i$	−0.434	−2.063	**0.049****			
Intercept	0.321	0.532	0.599	3.050	**0.046****	25.3
COM$_i$	0.106	2.782	**0.010*****			
EXP$_i$	0.010	0.364	0.719			
U_IC.C$_i$	−0.205	−0.937	0.357			

Notes: This table includes the regression results of the following model:

$$ACC_i = \beta_0 + \beta_1 COM_i + \beta_2 EXP_i + \beta_3 U\_CAT_i + e_i$$

where ACC$_i$: the mean forecast accuracy (measured as the absolute difference between the forecasted and the actual EPS scaled by the actual EPS) of the companies followed by financial analyst i; COM$_i$: the number of companies followed by financial analyst i; EXP$_i$: the years of experience of financial analyst i; U_CAT$_i$ = the usage of the non-financial information category CAT by financial analyst i, with CAT = TOT: "aggregate amount of non-financial information"; ANA: "management's analysis of financial and non-financial data"; ANA.A: "reasons for changes in the financial, operating and performance related data"; ANA.B: "the identity and past effect of key trends"; FWL: "forward-looking information"; MAN: "information about management and shareholders"; BI: "background information"; BI.A: "broad objectives and strategy"; BI.B: "scope and description of business and properties"; BI.C: "impact of industry structure on the company"; IC: "intellectual capital information"; IC.A: "human capital"; IC.B: "internal structure"; IC.C: "external structure"; *** significant at a 1% level; ** significant at a 5% level; * significant at a 10% level; e_i: error term.

consistent with the univariate statistics, a positive, significant relationship between the use of the non-financial information categories FWL and IC.B and the analysts' forecast accuracy, as well as a significant positive association (on a 10% level) between the use of the information category BI.C (impact of industry structure on the company) and the analysts' forecast accuracy. Hypothesis 4 is, therefore, supported regarding the information categories FWL, IC. B, and BI.C; it is not supported for the remaining information categories.

5. Discussion and topics for further research

This study examines the relevance of non-financial information to the Belgian capital market. Prior studies document that non-financial information is given greater weight in judging the value of a company. And, capital-market participants are requiring firms to voluntarily disclose more non-financial information.

Our empirical results suggest that companies have disclosed more non-financial information over time in response to the demands of regulatory bodies, financial analysts, and other capital-market participants for these disclosures. These findings correspond to the research results of earlier studies (e.g., Marston & Polei, 2004; Vandemaele et al., 2005). Despite this increase, financial analysts tend not to use the additional voluntary non-financial information except in two categories: forward-looking information and the internal structure of the company. Our findings further document that the increase in the disclosure of voluntary non-financial information has narrowed the gap between the information financial analysts require and the information provided by corporate managers.

We evaluated the use of non-financial information by examining the content of financial analysts' reports as compared to annual reports. This analysis is supplemented by a survey questionnaire. In general, the information use statistics found by the content-analysis method and the survey method differ very little. However, based on the survey results, we note that the use of forward-looking information and internal-structure information is positively related to the analysts' forecast accuracy. This is in contrast to the content analysis of analyst reports which shows no significant relationship.

An interesting topic for further research would be to examine whether information used by financial analysts, but which does not appear in their reports, has an influence on forecast accuracy. The results of this study should encourage listed companies to continue to enhance their disclosure strategy.

Acknowledgment

References

Abdolmohammadi, M. J. (2005). Intellectual capital disclosure and market capitalization. *Journal of Intellectual Capital*, *6*(3), 397−416.

Ackert, L. F., Church, B. K., & Shehata, M. (1996). What affects individuals' decisions to acquire forecasted information? *Contemporary Accounting Research*, *13*(2), 379−399.

American Institute for Certified Public Accountants (AICPA). (1994). *Improving business reporting: a customer focus: Meeting the information needs of investors and creditors.* Report of the special committee on financial reporting New York: AICPA.

Amir, E., & Lev, B. (1996). Value-relevance of nonfinancial information: The wireless communications industry. *Journal of Accounting and Economics*, *22*(1), 3−30.

Barker, R. G. (1998). The market for information: Evidence from finance directors, analysts and fund managers. *Accounting and Business Research*, *29*(1), 3−20.

Beattie, V., McInnes, B., & Fearnley, S. (2002). *Narrative reporting by listed UK companies: A comparative within-sector topic analysis.* Research paper University of Stirling.

Beretta, S., & Bozzolan, S. (2004). A framework for the analysis of firm risk communication. *The International Journal of Accounting*, *39*(3), 265−288.

Blij, I. H. C. (2001). Het gebruik van jaarrekeningen door analisten. *Maandblad voor Accountancy en Bedrijfseconomie*, *75*(10), 421−430.

Botosan, C. A. (1997). Disclosure level and the cost of equity capital. *Accounting Review*, *72*(3), 323−350.

Botosan, C. A., & Plumlee, M. A. (2002). A re-examination of disclosure level and the expected cost of equity capital. *Journal of Accounting Research*, *40*(1), 21−40.

Bowen, R. M., DuCharme, L., & Shores, D. (1995). Stakeholders' implicit claims and accounting method choice. *Journal of Accounting and Economics*, *20*(3), 255−295.

Bozzolan, S., Favotto, F., & Ricerri, F. (2003). Italian annual intellectual capital disclosure. *Journal of Intellectual Capital*, *4*(4), 543−558.

Brennan, N. (2001). Reporting intellectual capital in annual reports: Evidence from Ireland. *Accounting, Auditing and Accountability Journal*, *14*(4), 423−436.

Breton, G., & Taffler, R. J. (2001). Accounting information and analyst stock recommendation decisions: A content analysis approach. *Accounting and Business Research*, *31*(2), 91−102.

Brown, L. D. (2001). How important is past analyst forecast accuracy. *Financial Analysts Journal*, *57*(6), 44−49.

Brown, S., Hillegeist, S. A., & Lo, K. (2004). Conference calls and information asymmetry. *Journal of Accounting and Economics*, *37*(3), 343−366.

Capstaff, J., Rees, W., & Paudyal, K. (1998). Analysts' forecasts of German firms' earnings: A comparative analysis. *Journal of International Financial Management & Accounting*, *9*(2), 83−116.

Clement, M. B. (1999). Analyst forecast accuracy: Do ability, resources, and portfolio complexity matter. *Journal of Accounting and Economics*, *27*(3), 285−303.

Clement, M. B., & Tse, S. V. (2003). Do investors respond to analysts' forecast revisions as if forecast accuracy is all that matters. *Accounting Review*, *78*(1), 227−249.

Cooke, T. E. (1989). Disclosure in the corporate annual reports of Swedish companies. *Accounting and Business Research*, *19*(74), 113−124.

Covrig, V., & Low, B. S. (2005). The relevance of analysts' earnings forecasts in Japan. *Journal of Business Finance and Accounting*, *32*(7−8), 1437−1463.

Dempsey, S. J., & Gatti, J. F. (1997). The use of strategic performance variables as leading indicators in financial analysts' forecasts. *Journal of Financial Statement Analysis*, *2*(4), 61−79.

Duru, A., & Reeb, D. M. (2002). International diversification and analysts' forecast accuracy and bias. *Accounting Review*, *44*(2), 415−433.

Engelen, P. -J. (1999). *Informatieverstrekking door beursgenoteerde vennootschappen: efficiënte financiële markten en beursregulering in België.* Antwerpen: Intersentia Rechtswetenschappen.

Financial Accounting Standards Board (FASB). (2001). *"Improving business reporting: insights into enhancing voluntary disclosures" Steering Committee Report, Business Reporting Research Project.*

Flöstrand, P., & Ström, N. (2006). The valuation relevance of non-financial information. *Management Research News*, *29*(9), 580−597.

Fort, P. C. (1997). Analysts' forecast accuracy and the presentation of a mandated accounting change. *Journal of Applied Business Research*, *13*(4), 93−105.

Francis, J. R., Khurana, I. K., & Pereira, R. (2005). Disclosure incentives and effects on cost of capital. *Accounting Review*, *80*(4), 1125−1162.

García-Meca, E. (2005). Bridging the gap between disclosure and use of intellectual capital information. *Journal of Intellectual Capital*, *6*(3), 427−440.

García-Meca, E., & Martínez, I. (2007). The use of intellectual capital information in investment decisions: An empirical study using analyst reports. *International Journal of Accounting*, *42*(1), 57−81.

Graham, C. M., Cannice, M. V., & Sayre, T. L. (2002). The value relevance of financial and non-financial information for internet companies. *Thunderbird International Business Review*, *44*(1), 47−70.

Gray, S. J., Radebaugh, L. H., & Robert, C. B. (1990). International perceptions of cost constraints on voluntary information disclosures: A comparative study of U.K. and U.S. multinationals. *Journal of International Business Studies*, *21*(4), 597−622.

Grüning, M., & Stöckmann, K. (2004). Corporate disclosure policy of German DAX-30 companies. Paper presented at the 27th EAA-annual congress Prague.

Gu, Z., & Wu, J. S. (2003). Earnings skewness and analyst forecast bias. *Journal of Accounting and Economics*, *35*(1), 5−29.

Guo, R. -J., Lev, B., & Zhou, N. (2004). Competitive costs of disclosure by Biotech IPO's. *Journal Accounting Research*, *42*(2), 319−355.

Guthrie, J., & Petty, R. (2000). Intellectual capital: Australian annual reporting practices. *Journal of Intellectual Capital*, *1*(3), 241−251.

Hail, L. (2002). The impact of voluntary corporate disclosures on the ex-ante cost of capital for Swiss firms. *European Accounting Review*, *11*(4), 741−772.

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

Healy, P. M., & Palepu, K. G. (1993). The effect of firms' financial disclosure strategies on stock prices. *Accounting Horizons*, *7*(1), 1−11.

Hirst, E. D., Koonce, L., & Simko, P. J. (1995). Investor reactions to financial analysts' research reports. *Journal of Accounting Research*, *33*(2), 335−351.

Ho, L. -C. J., & Tsay, J. (2004). Analysts' forecasts of Taiwanese firms' earnings: Some empirical evidence. *Review of Pacific Basin Financial Markets and Policies*, *7*(4), 571−597.

Ho, S. S. M., & Wong, K. S. (2001). A study of corporate disclosure practice and effectiveness in Hong Kong. *Journal of International Financial Management and Accounting*, *12*(1), 75−102.

Ho, S. S. M., & Wong, K. S. (2004). Investment analysts' usage and perceived usefulness of corporate annual reports. *Corporate Ownership & Control*, *1*(3), 61−71.

Hofstede, G. (2001). *Culture's consequences: comparing values, behaviors, institutions, and organizations across countries*, 2nd ed. Thousand Oaks: Sage.

Hope, O. -K. (2003). Disclosure practices, enforcement of accounting standards, and analysts' forecast accuracy: An international study. *Journal of Accounting Research*, *41*(2), 235−272.

Holland, J., & 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*, *4*(4), 465−486.

Ittner, C. D., & Larcher, D. F. (1999). Are nonfinancial measures leading indicators of financial performance. *Journal of Accounting Research*, *36*(3), 1−35.

Jacob, J., Lys, T. J., & Neal, M. A. (1999). Expertise in forecasting performance of security analysts. *Journal of Accounting and Economics*, *28*(1), 27−50.

Kristensen, K., & Westlund, A. H. (2004). Accountable business performance measurement for sustainable business excellence. *Total Quality Management*, *15*(5–6), 629−643.

Lang, M. H., Lins, K. V., & Miller, D. P. (2003). ADRs, analysts and the accuracy: Does cross listing in the United States improve a firm's information environment and increase market value? *Journal of Accounting Research*, *41*(2), 317−345.

Lang, M. H., & Lundholm, R. J. (2000). Voluntary disclosure and equity offerings: Reducing information asymmetry or hyping the stock? *Contemporary Accounting Research*, *17*(4), 623−662.

La Porta, R., Lopez-de-Silanes, F., Schleifer, A., & Vishny, R. W. (1997). Legal determinants of external finance. *The Journal of Finance*, *52*(3), 1131−1150.

La Porta, R., Lopez-de-Silanes, F., Schleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of Political Economy*, *106*(6), 1113−1155.

La Porta, R., Lopez-de-Silanes, F., & Schleifer, A. (2006). What work in securities laws. *Journal of Finance*, *61*(1), 1−32.

Leuz, C., & Verrecchia, R. E. (2000). The economic consequences of increased disclosure. *Journal of Accounting Research*, *38*(3), 91−124.

Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings management and investor protection: An international comparison. *Journal of Financial Economics*, *69*(3), 505−527.

Lev, B., & Zarowin, P. (1999). The boundaries of financial reporting and how to extend them. *Journal of Accounting Research*, *37*(2), 353−385.

Liang, C. -J., & Yao, M. -L. (2005). The value relevance of financial and nonfinancial information — Evidence from Taiwan's information electronics industry. *Review of Quantitative Finance and Accounting*, *24*(2), 135−157.

Marston, C., & Polei, A. (2004). Corporate reporting on the Internet by German companies. *International Journal of Accounting Information Systems*, *5*(3), 285−311.

Marston, C., & Shrives, P. (1991). The use of disclosure indices in accounting research: A review article. *British Accounting Review*, *23*(3), 195−210.

McEwen, R. A., & Hunton, J. E. (1999). Is analyst forecast accuracy associated with accounting information use? *Accounting Horizons*, *13*(1), 1−16.

Meek, G., Roberts, C. B., & Gray, S. J. (1995). Factors influencing voluntary annual report disclosures by US, UK, and continental European multinational corporations. *Journal of International Business Studies*, *26*(3), 555−572.

Moneva, J. M., & Llena, F. (2000). Environmental disclosures in the annual reports of large companies in Spain. *European Accounting Review*, *9*(1), 7−29.

Mueller, G., Gernon, H., & Meek, G. (1994). *Accounting: an international perspective*, 3rd ed. New York: Irwin.

Nielsen, C. (2005). Essays on business reporting: production and consumption of strategic information in the market for information. Ph.D. Dissertation, Copenhagen Business School.

Plumlee, M. (2003). The effect of information complexity on the analysts' use of that information. *Accounting Review*, *78*(1), 275−296.

Previts, G. J., Bricker, R. J., Robinson, T. R., & Young, S. J. (1994). A content analysis of sell-side financial analyst company reports. *Accounting Horizons, 8*(2), 55−70.

Richardson, A. J., & Welker, M. (2001). Social disclosure, financial disclosure and the cost of equity capital. *Accounting, Organizations and Society, 26*(7), 597−616.

Robb, S. W. G., Single, L. E., & Zarzeski, M. T. (2001). Non-financial disclosures across Anglo-American countries. *Journal of International Accounting, Auditing & Taxation, 10*(1), 71−83.

Rogers, R. K., & Grant, J. (1997). Content analysis of information cited in reports of sell-side financial analysts. *Journal of Financial Statement Analysis, 3*(1), 14−30.

Sercu, P., & Sips, G. (1993). Leveren beleggingsadviezen een uitzonderlijk rendementop. *Tijdschrift voor Economie en Management, 38*(4), 371−383.

Sengupta, P. (1998). Corporate disclosure quality and the cost of debt. *Accounting Review, 73*(4), 459−474.

Sinha, P., Brown, L. D., & Das, S. (1997). A re-examination of financial analysts' differential earnings forecast accuracy. *Contemporary Accounting Research, 14*(1), 1−42.

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

Vandemaele, S. N., Vergauwen, P. G. M. C., & Smits, A. J. (2005). Intellectual capital disclosure in The Netherlands, Sweden and the UK: A longitudinal and comparative study. *Journal of Intellectual capital, 6*(3), 1469−1930.

Vanstraelen, A., Zarzeski, M. T., & Robb, S. W. (2003). Corporate non-financial disclosure practices and financial analyst behavior across three European countries. *Journal of International Financial Management and Accounting, 14*(3), 249−278.

Vergoossen, R. G. A. (1993). The use and perceived importance of annual reports by investment analysts in the Netherlands. *European Accounting Review, 2*(2), 219−244.

Welker, M. (1995). Disclosure policy, information asymmetry and liquidity in equity markets. *Contemporary Accounting Research, 11*(3), 801−828.

Womack, K. L. (1996). Do brokerage analysts' recommendations have investment value. *Journal of Finance, 51*(1), 137−166.