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Raf Orens^a & Nadine Lybaert^b

^a Assistant Professor Accountancy, Department of Business Studies, Lessius (K. U. Leuven), Korte Nieuwstraat 33, Antwerpen, 2000, Belgium E-mail:

^b Associate Professor in Accountancy, Hasselt University (KIZOK), Belgium
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Determinants of sell-side financial analysts' use of non-financial information

Raf Orens and Nadine Lybaert*

Abstract — This paper aims to research the context within which sell-side financial analysts make decisions to use corporate non-financial information. Prior research has demonstrated that financial analysts take into account non-financial information in their analyses of firms, but knowledge is scarce about what determines their use of this information. Based on a survey conducted among Belgian financial analysts, we observe a significant negative association between the financial analysts' use of non-financial information and the earnings informativeness of a firm's financial statement information proxied by leverage and stock return volatility. We also find that a higher amount of non-financial information is used by less experienced financial analysts and by financial analysts covering a higher number of firms.

Keywords: financial analysts; market for information; non-financial information

1. Introduction

The quality, relevance and timeliness of corporate information are important issues in the efficient functioning of capital markets. A critical element in this respect is an efficient flow of information among capital market participants as firms, investors or financial analysts (Barker, 1998; Holland and Johanson, 2003). Traditionally, financial statement information has been useful in assessing firms. However, current trends, such as globalisation, the introduction of new technologies and new businesses, and the transition towards a knowledge economy, decrease the value relevance of financial statement information. Financial analysts and investors have been observed to rely on information beyond the financial statements (i.e. non-financial information) to judge firm value (Amir and Lev, 1996; Ittner and Larcker, 1998; Lev and Zarowin, 1999; Graham et al., 2002; Liang and Yao, 2005).

Our paper investigates the behaviour of financial analysts in their use of non-financial information. Financial analysts are primary users of corporate information (Schipper, 1991), and are representatives of the investment community for which the reporting of corporate information is primarily

intended (IASB, 2005). Prior research has shown that investors rely strongly on financial analysts' earnings forecasts, recommendations and reported information (Hirst et al., 1995; Ackert et al., 1996; Womack, 1996). We examine in detail the drivers of the financial analysts' use of non-financial information and propose that the usage of such information increases with a decrease in the information content of the firm's earnings, proxied by firm leverage and stock return volatility. This proposition is consistent with the two most important functions of financial analysts: releasing information to investors and monitoring firm management (Chen et al., 2002). The importance of both functions is increasing with a decrease in the earnings informativeness. We further propose that the financial analysts' use of non-financial information is associated with their experience and task complexity. Since the theoretical justification of the determinants that drive the financial analysts' decision to use non-financial information is scarce, subsequent research could use the insights of our study to develop testable hypotheses.

We focus our study on Belgian sell-side financial analysts covering Belgian listed firms. The Belgian financial reporting environment is similar to that of other continental European countries. A common characteristic is the lower quality of financial statement information due to lower levels of enforcement, earnings management practices, concentrated ownership structures and less developed equity markets (La Porta et al., 1997, 1998; Leuz et al., 2003). Belgian brokerage firms face market characteristics similar to those experienced in other small continental European countries (e.g. Austria) and Scandinavian countries (e.g. Denmark or

*Raf Orens is Assistant Professor in Accountancy at Lessius (K. U. Leuven), Belgium and Nadine Lybaert is Associate Professor in Accountancy at Hasselt University (KIZOK), Belgium.

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Correspondence should be addressed to: Raf Orens, Assistant Professor Accountancy, Lessius (K. U. Leuven), Department of Business Studies, Korte Nieuwstraat 33, 2000 Antwerpen, Belgium. E-mail: raf.orens@lessius.eu.

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Finland) (Bolliger, 2004). In particular, Belgian brokerage firms employ a similar number of financial analysts, and these financial analysts have comparable levels of experience and task complexity (Bolliger, 2004).

To observe financial analysts' use of non-financial information, we conduct a survey among these stakeholders. This approach allows us to collect primary data but it has the disadvantages that responses are received which may not correspond with actual practice, or that the respondents may not comprehend the questions, or that responses cannot be explored in more detail. To deal with these disadvantages, our questionnaire has been read and reviewed by four experts in the field to identify whether all questions were comprehensible. In addition, we have performed content analysis on the reports written by financial analysts as a robustness check on the questionnaire results.

Our results show that Belgian sell-side financial analysts often use non-financial information in assessing firms. Consistent with our propositions, we demonstrate that financial analysts following firms with higher stock return volatility and firms with higher leverage use more non-financial information. Financial analysts' experience and task complexity are also related to their use of non-financial information. Our empirical findings should be of interest to regulators (i.e. standard-setters or stock exchanges) as they have to evaluate whether current reporting requirements, which mainly have a financial focus, are sufficient to meet the information needs of capital market participants. Regulators face difficulties in setting non-financial information requirements as the importance of non-financial information depends on firm and industry characteristics (e.g. Skinner, 2008; Stark, 2008). A common framework including non-financial information would be irrelevant for all firms in assisting investors or financial analysts in assessing firms (Stark, 2008). Our results seem to be in line with these statements. We find that the emphasis placed on non-financial information by financial analysts depends on the nature of the firms covered. In other words, firm-specific factors drive the relevance of non-financial information for financial analysts.

The remainder of the paper is structured as follows. Section 2 reviews relevant prior literature and Section 3 develops our research propositions. The research design is explained in Section 4 and the research results are discussed in Section 5. Section 6 presents sensitivity tests. Section 7 summarises the paper and provides some questions for further research.

2. The relevance of non-financial information

The importance and relevance of non-financial information in decision-making has been the subject of prior studies. However, many provide only some examples of non-financial information metrics, (e.g. Said et al., 2003; Juntilla et al., 2005), rather than a clear definition of non-financial information. The definition of 'non-financial information' that we follow here is included in the special report to the Financial Accounting Standards Board (FASB) on business and financial reporting (Upton, 2001: 5), stating that 'non-financial disclosures and metrics include index scores, ratios, counts and other information not presented in the basic financial statements'. The basic financial statements are the balance sheet, the income statement, the notes, the cash flow statement and the stockholders' equity statement (IAS 1.8, IASB, 2005). Authors such as Robb et al. (2001), Amir et al. (2003) and Flöstrand (2006) also define non-financial information in this way. Amir and Lev (1996) define non-financial information as non-accounting information. According to Barker and Imam (2008), non-accounting information is all information drawn from outside the financial statements. This approach differs slightly from Upton's definition. For instance an earnings forecast, being a metric published outside financial statements, is considered as non-financial information according to Upton's definition but, following Barker and Imam, this is considered to be financial information because an earnings forecast is drawn from financial statements.

Several studies have emerged on the value relevance of corporate non-financial information, using archival data. The first approach described here is seen in the stream of literature that examines the usefulness of non-financial performance measurements to predict future earnings or firm market values. Amir and Lev (1996) demonstrate that share prices are associated with the non-financial indicators 'Population in a service area' and 'Market penetration'. Hirschey et al. (2001) find that non-financial information on patent quality affects stock prices. Banker et al. (2000) show that non-financial measures of customer satisfaction are related to future financial performance. Ittner and Larcker (1998) find the same association, but in their study customer satisfaction does not have an influence on market returns. Kallapur and Kwan (2004) show that recognised brand values affect firm values.

A second approach to determining the relevance of corporate non-financial information is to examine the impact of non-financial disclosure on the

quality of financial analysts' earnings estimates. Vanstraelen et al. (2003) find a positive association between financial analysts' earnings forecast accuracy and forward-looking disclosure. Barron et al. (1999) demonstrate that better quality information included in the Management Discussion and Analysis enhances the accuracy of the analysts' earnings forecasts. These findings support Opdyke's (2000) argument that a strong focus by financial analysts on financial data does not yield accurate earnings forecasts. Orens and Lybaert (2007) show that financial analysts using more forward-looking information, as well as information about innovation and research and development, make smaller errors in estimating future earnings. These results confirm the survey findings of Epstein and Palepu (1999) and Eccles et al. (2001) showing that financial statements are insufficient for meeting financial analysts' information needs.

A third approach determines the relevance of non-financial information by examining the extent to which financial analysts use such information. To discover this, content analysis is often applied to analysts' reports. Rogers and Grant (1997), Breton and Taffler (2001), García-Meca (2005), Flöstrand (2006), García-Meca and Martínez (2007) and Orens and Lybaert (2007) find that a substantial proportion of an analysts' report includes non-financial information. Flöstrand (2006) also shows that analysts' reports issued for firms in the pharmaceutical industry and the telecommunications industry contain more intellectual capital information compared with analysts' reports on energy firms. Conversely, Barker and Imam (2008) find that industry membership does not affect the relative use of accounting and non-accounting keywords to describe earnings quality. García-Meca and Martínez (2007) find that the amount of non-financial information in the analysts' reports increases with profitability and with growth opportunities. Applying protocol analysis, Bouwman et al. (1995) demonstrate that financial analysts collect non-financial information to gain a better insight into firm performance and to observe unusual facts. Dempsey et al. (1997) conduct a survey among financial analysts, finding that financial analysts often use non-financial performance measurements to assess firms.

Despite the increasing importance of non-financial information, such information is hard to mandate and to standardise due to the firm- and industry-specific nature of non-financial information, the disclosure costs (e.g. competitive costs) and the risk of receiving vague and uninformative

disclosure (Skinner, 2008; Stark, 2008). Voluntary non-financial disclosure is considered to be more effective in improving the efficient functioning of capital markets rather than mandating non-financial disclosure (Skinner, 2008). Increased information requirements are additionally detrimental for small listed firms as they lack the financial resources to provide this information (Bushee and Leuz, 2005; Ahmed and Schneible, 2007; Gomes et al., 2007). Based on a survey among financial analysts, corporate managers and investors, Eccles and Mavrinac (1995) find no support for regulatory requirement of non-financial information. Various initiatives have therefore recommended firms to disclose non-financial information voluntarily. For instance, the Jenkins Committee of the American Institute of Certified Public Accountants (AICPA, 1994) concluded that users are unable to assess firms based on traditional financial statement information. The AICPA (1994) developed a business reporting model which includes non-financial information that firms could report voluntarily. The FASB (2001) extended this reporting model by the inclusion of intangible-related information.

3. Research propositions

Despite the empirical findings discussed in the previous section, additional research is required to understand the context within which financial analysts make decisions to use corporate non-financial information in assessing a firm's current financial position, in estimating a firm's earnings or in recommending investment in a stock. In this section, we develop our research propositions which are based on judgments and prior empirical research rather than on theoretical foundations. These propositions are tentative and need to be elaborated in future research. We first develop propositions based on the characteristics of the firms that are included in the financial analyst's portfolio. We then construct research propositions about two demographic characteristics of financial analysts, namely their experience and the complexity of their portfolio.

3.1. Characteristics of firms

We assume that financial analysts use a higher amount of non-financial information when following firms whose current earnings are less informative. If they are less informative, current earnings are less related to future earnings, future cash flows or security prices (Martikainen, 1997; Hodgson and Stevenson-Clarke, 2000; Skinner, 2008). As current financial statement information is less indicative of future company results, financial analysts and

investors are expected to collect additional information in order to interpret current earnings and to estimate future firm performance and firm value (Das et al., 1998; Eccles et al., 2001; Amir et al., 2003). Non-financial information is thereby used to add meaning to accounting data and to assess the quality of current earnings (Barker and Imam, 2008). The increased use of non-financial information where there is a reduction in earnings informativeness is consistent with the two most important functions of financial analysts, namely releasing information to investors and monitoring corporate management (Chen et al., 2002).

The first role of financial analysts is to provide reliable information to investors (Jorge and Rees, 1998; Barker, 2000; Cheng et al., 2006). Analysts add value to investors by transforming a relatively large amount of publicly available information into useful and relevant information for investment decisions (Hong et al., 2000; Elgers et al., 2001). Hayes (1998) asserts that the efforts devoted by financial analysts to collecting information depend on the trading commissions that could be generated. Since investors are risk averse, a decrease in the information content of earnings increases the willingness of investors to rely on financial analysts to become informed about a firm, increasing the financial analysts' contribution to investors (Amir et al., 2003). Analysts have more incentives to collect information since the provision of more information supporting analysts' recommendations increases investors' willingness to trade (Hong et al., 2000). In addition, investors are often unfamiliar with the interpretation of non-financial information (Maines and McDaniel, 2000; Maines et al., 2002; Hoff and Wood, 2008) due to the non-comparability of this information across firms (Maines et al., 2002). Investors rely on financial analysts to become informed (Eccles and Crane, 1988; Amir et al., 1999; Hoff and Wood, 2008), increasing the incentives for financial analysts to collect non-financial information.

Firm monitoring is the second important function of financial analysts. By assessing firms, analysts are able to reduce agency problems between shareholders and corporate management (Jensen and Meckling, 1976; Chung and Jo, 1996; Doukas et al., 2000). Where earnings are less informative, agency problems between investors and corporate management increase (Chung et al., 2005; Jiraporn and Gleason, 2007; LaFond and Watts, 2008). The increased agency costs are mitigated by the monitoring role of financial analysts (Jensen and Meckling, 1976; Moyer et al., 1989). To perform their monitoring role, financial analysts have to rely

more on corporate non-financial information where there is decreasing earnings informativeness.

We conclude that financial analysts are assumed to use more non-financial information when the information content of a firm's earnings is lower.

In our study, earnings informativeness is proxied indirectly by identifying factors that have been shown to affect the information content of earnings.¹ Firth et al. (2007) show that earnings informativeness is associated with risk and growth opportunities, which may be proxied by the market-to-book ratio (García-Meca and Martínez, 2007). We do not include this variable in our analyses because the market-to-book ratio is considered as a proxy for the use of non-financial information by capital market participants (Hossain et al., 2005), which biases our research findings. Risk is an indication of uncertainty, allowing financial analysts to gain from the acquisition of information (García-Meca and Martínez, 2007). Proxies for risks that are often employed in the empirical literature in association with the information content of earnings are firm size, leverage and stock return volatility (Warfield et al., 1995; Lui et al., 2007). Size, in association with the use of non-financial information, can however bias our results. Although smaller firms are considered to be more risky, which may increase financial analysts' need to collect and use non-financial data, smaller firms seem to disclose a lower amount of non-financial information compared to larger firms (Lang and Lundholm, 1993; Vanstraelen et al., 2003). This implies easier access to non-financial information for financial analysts covering larger firms compared to smaller firms, facilitating the use of non-financial information for financial analysts following larger firms (García-Meca and Martínez, 2007). Hence, firm size may have a positive or a negative association with the use of non-financial information. Following the empirical literature, the accessibility to non-financial information is unrelated to a firm's leverage or a firm's stock return volatility (e.g. Depoers, 2000; Ettredge et al., 2002; Gul and Leung, 2004). Hence, we decide to use the latter measurements as proxies for the level of earnings informativeness.

Hodgson and Stevenson-Clarke (2000) find that

¹ Earnings informativeness can also be proxied in a direct way by relating current earnings to future earnings. In order to evaluate the information content of earnings for each firm, financial data of consecutive periods are necessary. Quarterly financial data in this context are best suited, but Belgian listed firms were not required to publish quarterly interim statements at the time of our study. Although half-yearly reports were required, these were not included in the database available to us. Hand collection would leave gaps in the data.

investors perceive earnings disclosed by firms with higher leverage to be less informative due to the increased likelihood of firm failure and earnings management. In a similar way, Watts and Zimmerman (1990) assert that the level of earnings management correlates with firm leverage. Duke and Hunt (1990) and Press and Weintrop (1990) show empirically that higher leveraged firms to a larger extent apply income-increasing accounting methods. Managers of these firms have to report earnings that are high enough to cover interest, amortisation, and dividends. Hence, the earnings informativeness decreases with an increase in firm leverage (Dhaliwal et al., 1991; Martikainen, 1997; Yeo et al., 2002; Petra, 2007). The informativeness of financial statement information also decreases with an increase in the variability of a firm's stock returns (Lipe, 1990; Warfield et al., 1995; Vafeas, 2000). Large stock price changes reflect larger changes in a firm's financial performance, increasing the uncertainty around future earnings. Since an inverse association exists between earnings informativeness on the one hand and firm leverage and stock return volatility on the other hand, we propose that financial analysts use a larger amount of non-financial information covering firms with higher leverage and higher stock return volatility, leading to the following research propositions:

RP 1: Financial analysts' use of non-financial information is positively associated with the mean leverage of the firms followed by the financial analysts.

RP 2: Financial analysts' use of non-financial information is positively associated with the mean volatility in stock returns of the firms followed by the financial analysts.

3.2. Demographic characteristics of analysts

Next, we develop two propositions related to financial analysts' experience and task complexity. Perkins and Rao (1990) and Hunton and McEwen (1997) observe that experts, in comparison to novices, have more cognitive structures allowing them to structure problems effectively. Less experienced decision-makers follow an opportunistic approach by collecting and examining all available information in a chronological manner. The more experienced financial analysts conduct a more sophisticated information search (Yates, 1990). They spend less time, and are more directed, in searching for information since they collect only information from a predetermined list of information items (Bouwman et al., 1987; Anderson, 1988; Hunton and McEwen, 1997; Frederickson and

Miller, 2004). These findings allow us to propose that less experienced financial analysts use a higher amount of non-financial information. Hence, we state that:

RP 3: Financial analysts' use of non-financial information is negatively associated with the experience of the financial analysts.

Financial analysts' use of corporate information also depends on task complexity (Plumlee, 2003). In our study, we proxy task complexity as the number of firms financial analysts follow. An increase in the number of firms reduces the time left to devote to each individual firm (Clement, 1999; Jacob et al., 1999; Brown, 2001), decreasing the complexity of the decision-makers' evaluation techniques and restricting the decision-makers' need to collect and use information (Paquette and Kida, 1988; Payn et al., 1992; Libby et al., 2002). As the efforts to collect information reduce with task complexity, we assume that financial analysts use a lower amount of non-financial information when they cover a higher number of firms.

On the other hand, an interview with a financial analyst informs us that financial analysts covering a smaller number of firms normally perform other tasks besides evaluating listed firms, such as taking sales orders or making direct client contacts, which reduce the time left to analyse the firms in their portfolio in detail. As a consequence, the use of non-financial information is restricted. Since the direction of the association between the use of non-financial information and task complexity is unclear, we posit the following research proposition:

RP 4: Financial analysts' use of non-financial information is associated with the number of firms they follow.

4. Research design

4.1. Measurement of the use of non-financial information by financial analysts

In this study we make use of survey data as a proxy for the financial analysts' use of non-financial information. Surveys have the advantage that primary data can be collected about the behaviour of financial analysts with regard to non-financial information. The survey method is helpful to provide insight into the black box created by archival studies which are inappropriate for observing the actual use of non-financial information by financial analysts. The survey has the disadvantages that responses are received which may not correspond with actual practice, that the respondents may

not comprehend the questions or that responses cannot be delved into in more detail. To deal with these disadvantages, our questionnaire has been proofread by two financial analysts and two academics to identify whether all questions were comprehensible. In addition, we have performed content analysis to the reports written by financial analysts as a robustness check for the questionnaire results. We detail the design of the content analysis approach in Section 5.2.

The non-financial information indicators included in the questionnaire are based on the recommendations contained in the reports AICPA (1994) and FASB (2001). Studies such as Rogers and Grant (1997), Robb et al. (2001) and Vanstraelen et al. (2003) also use these recommendations to construct their disclosure index. Using an existing disclosure index increases the validity of our research findings.

In 1994 the AICPA proposed a reporting model which included relevant corporate information, financial as well as non-financial, that users require in making investment decisions. This reporting model consists of a limited number of recommendations classified into five information categories: business data, management's analysis of financial and non-financial data, forward-looking information, information about management and shareholders and background information about the firm. All categories include non-financial measurements, but the category 'business data' also contains financial indicators. In 1998, the FASB studied the AICPA recommendations in order to enhance firms' corporate reporting practices. FASB (2001) extended the AICPA disclosure index by adding a sixth information category which consisted of non-financial information about firms' intangible assets. Unlike AICPA (1994), FASB (2001) did not provide an exhaustive list of information items that firms might disclose.

The disclosure index applied in our questionnaire includes 71 non-financial information items which are selected from both discussed papers, and which firms may disclose voluntarily.² The items are grouped into five non-financial 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 firm (BI): 23 items;
- Intellectual capital information (IC): 20 items.

The items from the categories ANA, FWL, MAN and BI are all non-financial information indicators included in the corresponding information categories discussed in AICPA (1994). The items mentioned in the category IC are derived from the non-financial information items included in the category 'business data' from AICPA (1994) together with indicators from the sixth information category of FASB (2001) regarding firms' intangible assets. Table 1 presents all non-financial information items included in the disclosure index of our study.

In our survey, each financial analyst was asked to indicate on a five-point Likert scale³ the extent to which each item is used in the analysis of all firms followed. This methodology biases the results to some extent since the use of corporate non-financial information by financial analysts may differ between the firms they analyse. Ideally, we should have asked each financial analyst to indicate the use of corporate non-financial information for each firm separately, but probably respondents would have been deterred by the length of the survey and would have been reluctant to provide so much detailed information about each firm. Similar to Dempsey et al. (1997), we asked financial analysts to indicate their average use of information. The sample size of our study consists of 31 responses, which is a response rate of 63% out of the population of 49 sell-side financial analysts employed by Belgian brokerage houses in 2005.

4.2. Regression model

The following multivariate regression model associates analysts' use of non-financial information to the independent variables:

$$USE_{ij} = \beta_0 + \beta_1 LEV_i + \beta_2 SDR_i + \beta_3 EXP_i + \beta_4 NCOM_i + \varepsilon$$

² In Belgium, firms are required to disclose relevant non-financial performance measurements (about, e.g. environmental performance or human resources information), research and development, shareholder structure, corporate governance and risks.

³ The scores in the questionnaire were arranged as follows: 1 = always used; 2 = often used; 3 = sometimes used; 4 = rarely used and 5 = never used. In order to facilitate the interpretation of our results – so that a higher score suggests a higher use of non-financial information – we have recoded our results as follows: 0 = never used; 1 = rarely used; 2 = sometimes used; 3 = often used and 4 = always used.

With:

USE_{ij} = average use of non-financial information by financial analyst i from the information category j , with j representing the average use of all 71 non-financial information items (TOT) and the average use of the five components of non-financial information, i.e. the categories ANA, FWL, MAN, BI and IC.

LEV_i = average ratio of long- and short-term debt to total assets of the firms followed by financial analyst i
 SDR_i = average standard deviation in daily stock returns of the firms followed by financial analyst i
 EXP_i = number of years that financial analyst i performs his/her profession
 $NCOM_i$ = number of firms followed by financial analyst i
 ε = error term

Table 1

Overview of the 71 non-financial information items included in the disclosure index

Category ANA: Management's analysis of financial and non-financial data

Reasons for changes in the financial, operating and performance-related data

Reasons identified by the management for changes in the volume of units sold or in revenues

Reasons identified by the management for changes in innovation

Reasons identified by the management for changes in profitability

Reasons identified by the management for changes in the long-term financial position

Reasons identified by the management for changes in the short-term liquidity and financial flexibility

Unusual or nonrecurring events and the effect of them on the firm

The identity and past effect of key trends

Social trends and the past effect of them on the firm

Demographic trends and the past effect of them on the firm

Political trends and the past effect of them on the firm

Macro-economic trends and the past effect of them on the firm

Regulatory trends and the past effect of them on the firm

Category FWL: Forward-looking information

Future risks for the firm

Future opportunities for the firm

Effects of the risks and opportunities on the business's future earnings and future cash flows

Activities and plans to meet the broad objectives and business strategy

Conditions that must occur within the business that management believes must be present to meet the broad objectives and business strategy

Conditions that must occur in the external environment that management believes must be present to meet the broad objectives and business strategy

Comparison of actual business performance to previously disclosed opportunities, risks and plans of the firm

New products launched in the next years

Expectations about the future growth of the firm

Evolution of future macro-economic indicators (e.g. economic climate, exchange rates) and the effect on the firm

Future production capacity of the firm

Category MAN: Information about management and shareholders

Directors and executive management

Major shareholder(s) of the firm's stock

Number of shares owned by the directors, managers or employees

Director and executive management compensation

Transactions and relationships among stakeholders and the firm

Disagreement with directors, auditors, bankers not associated with the firm

Table 1
Overview of the 71 non-financial information items included in the disclosure index (*continued*)

Category BI: Background information about the firm

Broad objectives and strategy

Broad objectives of the firm

Broad strategies of the firm

Consistency or inconsistency of the strategy with key trends affecting the business

Scope and description of business and properties

Industry in which the business participates

General development of the business

Principal products and services

Principal markets and market segments

Processes used to make and render principal products and services

Seasonality and cyclicity of the firm

Existing laws that have an influence on the business

Macroeconomic activity

Major contractual relationships with customers and suppliers

Location and productive capacity of the firm's principal plants

Impact of industry structure on the firm

Major suppliers of a firm

Availability or scarcity of supply of products or services

Relative bargaining power of suppliers

Dominant customers of the firm

Extent that the business is dispersed among its customers

Relative bargaining power of customers

Major competitors of a firm

Intensity of the competition

Competitive position

Ability of new firms to enter the business

Category IC: Intellectual capital information

Human capital

Compensation of employees

Education and training programmes of employees

Level of expertise of the employees

Staff policy

Job rotation

Employee satisfaction

Quality of the management

Internal structure

Productivity of a firm

Innovation (e.g. new products, new production processes)

Important patents, trademarks or licenses

Research and development programmes

Quality of the products or services

Organisation structure

Technological know how

Time required to perform activities such as production, delivery of products, development of new products

External structure

Evolution in the market share

Main brands of the firm

Customer satisfaction or customer loyalty

Realised acquisitions

Distribution and delivery methods

We use two data sources to measure our independent variables. The Bel-First database⁴ provides us with firm-specific data of 2005, and the survey contains the necessary demographic data. Since the dependent variable is measured as the average use of non-financial information of all firms included in a financial analyst's portfolio, we, in a similar way, compute LEV and SDR as the average leverage or the average stock return variability of the firms covered by each financial analyst. This approach biases our research findings to some extent, but it is also applied in other research areas.⁵

5. Research findings

5.1 Descriptive statistics

Table 2 presents the descriptive statistics for the use of non-financial information which ranges from 0 (never used) to 4 (always used) – and for the independent variables.

Panel A of Table 2 shows that financial analysts, with a mean score of 2.46, rely on non-financial information with a frequency 'sometimes to often'. However, the high standard deviation suggests a wide variation in this usage. The mean scores on analysts' use of non-financial information range from 1.06 (rarely used) to 3.77 (nearly always used) suggesting significant differences in the importance attached to the various information categories, which is supported by an ANOVA test. Our research data demonstrate that financial analysts often use background information about the firm (BI) and forward-looking information (FWL). Information about management and shareholders (MAN) and intellectual capital information (IC) is used to a lower extent. This result is surprising since intellectual capital information is useful to assess firm value (e.g. Barth and Clinch, 1998; Kallapur and Kwan, 2004), but it confirms prior findings from Johanson (2003) demonstrating that financial analysts have their reservations about the validity and the reliability of the reported IC information, and about the impact of this information on future cash flows. The use of IC disclosure is also

restricted by the reluctance of firms to report this information publicly, increasing collection costs for financial analysts (Dempsey et al., 1997). Our result that the sample financial analysts only use information about the management and shareholders occasionally is remarkable, given the fact that such information is largely disclosed by Belgian firms (Orens and Lybaert, 2007), increasing the accessibility of this information.

Panel B of Table 2 shows descriptive statistics for the independent variables. The respondents of our survey have, on average, 7.5 years experience in analysing listed firms and follow, on average, eight firms. The firm-specific determinants show a wide variation in the portfolio of firms followed by each financial analyst.

5.2 Multivariate regression results

We apply ordinary least squares (OLS) to test our propositions about the influences of the firm-specific and demographic determinants on the analysts' use of non-financial information. This approach can be criticised because the dependent variable, the average use of non-financial information, is censored between 0 and 4 through the use of ordinal data. However, alternative methods, such as asymptotic methods, seem to be no option as these create unreliable estimates with small sample sizes (Noreen, 1988). Similar to Dempsey et al. (1997) who have comparable data, we apply an OLS regression. We control for heteroscedasticity by the estimation of White's robust standard errors. The low levels of variance inflation factors (VIF) indicate that multicollinearity is not present in our data. The research results of the multivariate analyses are provided in Table 3.

The research findings in Table 3 reveal that financial analysts following higher leveraged firms, and firms with greater stock return volatility, employ significantly more non-financial information. This finding suggests that the level of earnings informativeness affects analysts' use of non-financial information. Hence, we are able to support RP1 and RP2. This finding is consistent across all non-financial information categories.

With regard to the demographic determinants, we conclude that less experienced financial analysts, and financial analysts covering more firms, use more non-financial information. These findings confirm RP3 and RP4. Breaking down non-financial information into various components, we observe that the use of three non-financial information categories, i.e. forward-looking information ($USE_{i,FWL}$), information about management and shareholders ($USE_{i,MAN}$) and background informa-

⁴ This database contains accounting data of all firms operating in Belgium that have filed their annual financial statement with the Central Balance Sheet Office of the National Bank of Belgium.

⁵ Many studies in the international accounting literature use mean scores on firm-specific variables in order to make comparisons across countries. La Porta et al. (1997), for instance, measure the median of the total debt to sales ratio for all the firms in a given country. Chang et al. (2000) relate the average size of the firms or the average ownership structure of the firms in a country to the average number of financial analysts following the firms in a country. Leuz et al. (2003) compute the average earnings management score of the firms operating in a country.

Table 2
Descriptive statistics for the dependent and independent variables

	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Standard deviation</i>
Panel A: Dependent variables¹				
USE _{i,TOT}	2.46	1.06	3.77	0.56
USE _{i,ANA}	2.39	1.27	3.64	0.61
USE _{i,FWL}	2.99	1.55	4.00	0.66
USE _{i,MAN}	1.91	0.17	4.00	0.90
USE _{i,BI}	2.88	0.60	4.00	0.88
USE _{i,IC}	1.91	0.65	3.45	0.52
Panel B: Independent variables				
<i>Characteristics of firms</i>				
LEV _i	0.468	0.146	0.663	0.133
SDR _i	0.089	0.033	0.138	0.027
<i>Demographic characteristics of financial analysts</i>				
EXP _i	7.45	1	26	4.88
NCOM _i	8.23	2	15	3.73

This table provides descriptive statistics for the dependent variables USE_{i,j}: average use of non-financial information by financial analyst *i* from the information category *j*, with *j* representing the average use of all 71 non-financial information items (TOT) and the average use of the five components of non-financial information, i.e. the categories ANA (management's analysis of financial and non-financial data), FWL (forward-looking information), MAN (information about management and shareholders), BI (background information about the firm) and IC (intellectual capital information) and for the independent variables LEV_i: average ratio of long- and short-term debt to total assets of the firms followed by financial analyst *i*; SDR_i: average standard deviation in daily stock returns of the firms followed by financial analyst *i*; EXP_i: number of years that financial analyst *i* performs his/her profession; NCOM_i: number of firms followed by financial analyst *i*.

¹ The scores on the measurements of non-financial information use range from 0 (never used) to 4 (always used).

tion about the company (USE_{i,BI}), show a negative association with financial analysts' experience and a positive association with financial analysts' task complexity.

6. Sensitivity analysis

Surveys are often criticised due to low response rates, the impossibility of delving deeper into responses, the possibility that respondents discuss their answers with others, and the possibility that responses do not reflect actual behaviour (Saunders et al., 1997). To control for the reliability of the survey results, we inspect the content of analysts' reports written by the respondents in our study. This approach overcomes the problem of subjectivity in surveys, but it has the drawback that no conclusions can be drawn as to whether financial analysts include all information they use in their reports. Limited space and competitive reasons restrict the amount of information mentioned in an analysts' report (Schipper, 1991; Rogers and Grant, 1997).

In particular, we study whether the frequency

with which items are mentioned in the analysts' reports corresponds with the frequency of use according to the survey results. We have selected the analysts' reports that were written during a period of one year prior to the survey. In general, two types of analysts' reports exist: company reports and result reports (García-Meca and Martínez, 2007). We have examined company reports only because, in these reports, financial analysts present a fundamental analysis of the firm. Such reports include a large amount of corporate information, providing a detailed picture of a firm's activities and performance. Financial analysts however do not publish such reports on a regular basis. Results reports are published frequently during the year and include information related to a particular event in a firm (e.g. an earnings announcement, the introduction of a new product or an acquisition). We have not researched these reports since they are restricted in providing non-financial information.

This selection procedure results in 40 analysts' reports written by 15 financial analysts that

Table 3
Multivariate regression results of the analysts' use of non-financial information on firm and demographic characteristics

USE_{ij}		<i>Intercept</i>	LEV_i	SDR_i	EXP_i	$NCOM_i$	<i>Adjusted R²</i>	<i>F-value</i>
$USE_{i,TOT}$	Coefficient	0.502	0.023	11.661	-0.947	0.066	35.9	5.205**
	T-value	1.005	3.302**	3.130**	-2.640**	2.472**		
$USE_{i,ANA}$	Coefficient	0.697	0.021	9.580	-0.623	0.039	16.6	2.493*
	T-value	1.148	2.505*	2.117*	-1.430	1.222		
$USE_{i,FWL}$	Coefficient	1.382	0.022	11.422	-1.317	0.074	26.4	3.685*
	T-value	2.227*	2.521**	2.468**	-2.958**	2.236*		
$USE_{i,MAN}$	Coefficient	-0.809	0.026	13.202	-1.063	0.137	24.6	3.442*
	T-value	-0.943	2.182*	2.064*	-1.728*	2.991**		
$USE_{i,BI}$	Coefficient	0.526	0.026	12.689	-1.049	0.085	35.9	5.197**
	T-value	0.919	3.274**	2.969**	-2.552**	2.788**		
$USE_{i,IC}$	Coefficient	0.552	0.017	9.242	-0.672	0.029	14.3	2.255*
	T-value	0.983	2.208**	2.209**	-1.668	0.956		

** significant on a 1% level; * significant on a 5% level (one-tailed), based on White (1980) corrected standard errors.

This table provides the multivariate regression results of the following model:

$$USE_{ij} = \beta_0 + \beta_1 LEV_i + \beta_2 SDR_i + \beta_3 EXP_i + \beta_4 NCOM_i + \varepsilon$$

with USE_{ij} : average use of non-financial information by financial analyst i from the information category j , with j representing the average use of all 71 non-financial information items (TOT) and the average use of the five components of non-financial information, i.e. the categories ANA (management's analysis of financial and non-financial data), FWL (forward-looking information), MAN (information about management and shareholders), BI (background information about the firm) and IC (intellectual capital information); and with the independent variables LEV_i : average ratio of long- and short-term debt to total assets of the firms followed by financial analyst i ; SDR_i : average standard deviation in daily stock returns of the firms followed by financial analyst i ; EXP_i : number of years that financial analyst i performs his/her profession; $NCOM_i$: number of firms followed by financial analyst i ; ε : error term.

The scores on the measurements of non-financial information use range from 0 (never used) to 4 (always used).

responded to our survey. We were unable to collect analysts' reports for all 31 respondents as we did not gain access to the reports written by all these financial analysts. The selected reports were issued for 26 Belgian listed firms. Each report is researched for the presence of the corresponding items included in the survey. We allocated a score of 1 when a particular non-financial information item is mentioned in an analysts' report and a score of 0 otherwise. We observe that financial analysts mainly disseminate forward-looking information and background information, but hardly mention intellectual capital information and information about the management and the shareholders in their reports. These findings support the survey results. In addition, we obtain a significant positive correlation between the mean score on each of the 71 non-financial information items based on the survey results and the frequency that each item occurred in the analysts' reports (untabulated results). Non-financial information elements being

used more frequently according to the survey, are more frequently inserted in the analysts' reports. These findings allow us to conclude that the results of our regression equation do not suffer from biases in the measurement of the dependent variable.

We also control for additional determinants that may affect the use of non-financial information by financial analysts. First, we examine whether the education level of financial analysts is related to the use of non-financial information. Belgian financial analysts have the opportunity to receive a specific training organised by the Chartered Financial Analysts Institute (CFA) or the Belgian Association of Financial Analysts (BAFA). Financial analysts are encouraged to take part in these training programmes on a voluntary basis. These courses enhance the knowledge and skills to perform analyses of firms (Huber et al., 1993; Lee et al., 2005). We propose that financial analysts who took part in these courses rely more on non-financial information to interpret financial statement infor-

mation. Our research findings (not tabulated) show that financial analysts who have attended such training programmes use more non-financial information.

The size of the brokerage firm is the second control variable which we associate with the use of non-financial information. Demirakos et al. (2004) show that brokerage houses differ in their preferences for using valuation models, such as discounted cash flows or accounting-based economic profitability models. Clement (1999) and Jacob et al. (1999) emphasise that larger brokerage houses employ more financial analysts and supporting staff, resulting in larger and better networks for collecting, disseminating and interpreting corporate information. Additionally, larger brokerage firms demonstrate a larger influence on capital markets than smaller brokerage houses. As a result, managers are more eager to provide voluntary information to analysts employed by larger brokerage houses. Both arguments suggest that analysts from larger brokerage firms have better access to non-financial information, which in turn may increase the usage of this information (Dempsey et al., 1997). Our research findings (not tabulated) show that financial analysts employed at larger brokerage houses do not employ significantly more non-financial information than financial analysts employed at smaller brokerage houses. We attribute this result to the low variation in the number of financial analysts operating in Belgian brokerage houses.

Finally, we research whether the average firm size and the proportion of firms with negative earnings in the financial analysts' portfolio affect the financial analysts' use of non-financial information. Prior literature shows that the information content of earnings is lower for small firms and loss-making firms (Hayn, 1995; Vafeas, 2000; Petra, 2007), suggesting an increased need for financial analysts to use non-financial information. However, our findings (not tabulated) are unsupportive for concluding that firm size and negative earnings influence the analysts' use of non-financial information.

7. Conclusion

The current study provides insight into the drivers of financial analysts' use of corporate non-financial information. Prior studies have found that financial analysts consider the importance of non-financial information in estimating value creation by firms, but these studies do not focus on the context within which financial analysts make the decision to use corporate non-financial information.

Based on tentative propositions, our empirical results show that financial analysts' use of non-financial information is negatively associated with the firm's earnings informativeness, proxied by the risk indicators leverage and stock return volatility. Financial analysts following firms with higher leverage and higher stock return volatility use more non-financial information than financial analysts covering firms with lower leverage or lower stock return volatility in order to counter concerns over higher risks and to capture underlying economic events. These findings are consistent with the two most important functions of financial analysts: providing information to investors and monitoring firm management. As earnings are less informative, the importance of both functions increases. In order to add meaning to the financial figures, financial analysts use non-financial information to perform both functions. Our empirical results also indicate that the less experienced financial analysts, and the financial analysts following a higher number of firms, make more efforts to use corporate non-financial information.

One important limitation of our study relates to the small sample size, which restricts the generalisation of our findings to other small continental European countries. Additional research in both code law and common law countries is necessary to increase our knowledge regarding the determinants affecting the financial analysts' use of non-financial information. Another limitation relates to the application of mean scores in the association between the use of non-financial information and firm-specific determinants. In a future study, the analysts' use of non-financial information for each individual firm separately could be examined instead of averaging the use of non-financial information across all firms covered by a financial analyst.

Because theoretical evidence about determinants of the use of non-financial information is scarce, further research is necessary to elaborate this research area. Our research propositions in this respect could be used to develop hypotheses about the drivers of analysts' use of non-financial information. Further research could also focus on the information sources on which financial analysts rely in collecting non-financial information. It is important to gain more insight into the extent to which financial analysts collect non-financial information privately. Such research maps the potential information asymmetry between investors and financial analysts. Future research can also focus on the impact of financial analysts' use of corporate non-financial information on financial analysts' esti-

mates of a firm's future cash flows and a firm's market value.

References

- Ackert, L., Church, B. and Shehata, M. (1996). 'What affects individuals' decisions to acquire forecasted information?'. *Contemporary Accounting Research*, 13(2): 379–399.
- Ahmed, A. and Schneible, R. (2007). 'The impact of regulation fair disclosure on investors' prior information quality – evidence from an analysis of changes in trading volume and stock price reactions to earnings announcements'. *Journal of Corporate Finance*, 13(2–3): 282–299.
- 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, NY: American Institute for Certified Public Accountants.
- Amir, E. and Lev, B. (1996). 'Value-relevance of non-financial information: The wireless communications industry'. *Journal of Accounting and Economics*, 22(1): 3–30.
- Amir, E., Lev, B. and Sougiannis, T. (1999). 'What value analysts?'. Working paper, The Recanati Graduate School of Management, Tel Aviv University, 42pp.
- Amir, E., Lev, B. and Sougiannis, T. (2003). 'Do financial analysts get intangibles?'. *European Accounting Review*, 12(4): 635–659.
- Anderson, M. (1988). 'A comparative analysis of information search and evaluation behaviour of professional and non-professional financial analysts'. *Accounting, Organizations and Society*, 13(5): 431–446.
- Banker, R., Potter, G. and Srinivasan, D. (2000). 'An empirical investigation of an incentive plan that includes nonfinancial performance measures'. *Accounting Review*, 75(1): 65–92.
- Barker, R. (1998). 'The market for information: evidence from finance directors, analysts and fund managers'. *Accounting and Business Research*, 29(1): 3–20.
- Barker, R. (2000). 'FRS3 and analysts' use of earnings'. *Accounting and Business Research*, 30(2): 95–109.
- Barker, R. and Imam, S. (2008). 'Analysts' perception of "earnings quality"'. *Accounting and Business Research*, 38(4): 313–329.
- Barron, O., Kile, C. and O'Keefe, T. (1999). 'MD&A quality as measured by the SEC and analysts' earnings forecasts'. *Contemporary Accounting Research*, 16(1): 75–109.
- Barth, M. and Clinch, G. (1998). 'Revalued financial, tangible, and intangible assets: associations with share prices and non-market based value estimates'. *Journal of Accounting Research*, 36(3): 199–233.
- Bolliger, G. (2004). 'The characteristics of individual analysts' forecasts'. *Journal of Banking and Finance*, 28(9): 2283–2309.
- Bouwman, M., Frishkoff, P. and Frishkoff, P. (1987). 'How do financial analysts make decisions? A process model of the investment screening decision'. *Accounting, Organizations and Society*, 12 (1): 1–29.
- Bouwman, M., Frishkoff, P. and Frishkoff, P. (1995). 'The relevance of GAAP-based information; a case study exploring some uses and limitations'. *Accounting Horizons*, 9(4): 22–47.
- Breton, G. and Taffler, R. (2001). 'Accounting information and analyst stock recommendation decisions: a content analysis approach'. *Accounting and Business Research*, 31(2): 91–102.
- Brown, L. (2001). 'How important is past analyst forecast accuracy'. *Financial Analysts Journal*, 57(6): 44–49.
- Bushee, B. and Leuz, C. (2005). 'Economic consequences of SEC disclosure regulation: evidence from the OTC Bulletin Board'. *Journal of Accounting and Economics*, 39(2): 233–264.
- Chang, J., Khanna, T. and Palepu, K. (2000). 'Analyst activity around the world'. Working paper, Harvard Business School, 46pp.
- Chen, C., Chan, K. and Steiner, T. (2002). 'Are all security analysts equal?'. *Journal of Financial Research*, 25(3): 415–430.
- Cheng, Y., Liu, M. and Qian, J. (2006). 'Buy-side analysts, sell-side analysts, and investment decisions of money managers'. *Journal of Financial and Quantitative Analysis*, 41(1): 51–83.
- Chung, K and Jo, H. (1996). 'The impact of security analysts' monitoring and marketing functions on the market value of firms'. *Journal of Financial and Quantitative Analysis*, 31(4): 493–512.
- Chung, R., Firth, M. and Kim, J.-B. (2005). 'FCF agency costs, earnings management, and investor monitoring'. *Corporate Ownership and Control*, 2(4): 51–61.
- Clement, M. (1999). 'Analyst forecast accuracy: do ability, resources, and portfolio complexity matter?'. *Journal of Accounting and Economics*, 27(3): 285–303.
- Das, S., Levine, C. and Sivaramakrishnan, K. (1998). 'Earnings predictability and bias in analysts' earnings forecasts'. *Accounting Review*, 73(2): 277–294.
- Demirakos, E., Strong, N. and Walker, M. (2004). 'What valuation models do analysts use'. *Accounting Horizons*, 18(4): 221–240.
- Dempsey, S., Gatti, J., Grinnell, J. and Cats-Baril, W. (1997). 'The use of strategic performance variables as leading indicators in financial analysts' forecasts'. *Journal of Financial Statement Analysis*, 2(4): 61–79.
- Depoers, F. (2000). 'A cost-benefit study of voluntary disclosure: some empirical evidence from French listed companies'. *European Accounting Review*, 9(2): 245–263.
- Dhaliwal, D., Lee, K. and Fargher, N. (1991). 'The association between unexpected earnings and abnormal security returns in the presence of financial leverage'. *Contemporary Accounting Research*, 8(1): 20–41.
- Doukas, J., Kim, C. and Pantzalis, C. (2000). 'Security analysis, agency costs, and company characteristics'. *Financial Analysts Journal*, 56(6): 54–63.
- Duke, J. and Hunt, H. (1990). 'An empirical examination of debt covenant restrictions and accounting-related debt proxies'. *Journal of Accounting and Economics*, 12(1–3): 45–63.
- Eccles, R. and Crane, D. (1988). *Doing deals: investment banks at work*. Harvard Business School Press Books, 288pp.
- Eccles, R. and Mavrinac, S. (1995). 'Improving the corporate disclosure process'. *Sloan Management Review*, 36(4): 11–25.
- Eccles, R., Herz, R., Keegan, E. and Phillips, D. (2001). *The ValueReporting revolution: moving beyond the earnings game*. 1st edn., New York, NY: John Wiley & Sons, 350pp.
- Elgers, P., Lo, M. and Pfeiffer, R. (2001). 'Delayed security price adjustments to financial analysts' forecasts of annual earnings'. *Accounting Review*, 76(4): 613–632.
- Epstein, M. and Palepu, K. (1999). 'What financial analysts want'. *Strategic Finance*, 80(10): 48–52.
- Ettredge, M., Richardson, V. and Scholz, S. (2002).

- 'Dissemination of information for investors at corporate web sites'. *Journal of Accounting and Public Policy*, 21 (4–5): 357–369.
- FASB. (2001). *Improving Business Reporting: Insights into Enhancing Voluntary Disclosures*. Steering Committee Report, Business Reporting Research Project, Financial Accounting Standards Board. 90pp.
- Firth, M., Fung, P. and Rui, O. (2007). 'Ownership, two-tier board structure, and the informativeness of earnings – evidence from China'. *Journal of Accounting and Public Policy*, 26(4): 463–496.
- Flöstrand, P. (2006). 'The sell side-observations on intellectual capital indicators'. *Journal of Intellectual Capital*, 7(4): 457–473.
- Frederickson, J and Miller, J. (2004). 'The effects of pro forma earnings disclosure on analysts' and nonprofessional investors' equity valuation judgments'. *Accounting Review*, 79(3): 667–686.
- 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. and 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.
- Gomes, A., Gorton, G. and Madureira, L. (2007). 'SEC regulation fair disclosure, information, and the cost of capital'. *Journal of Corporate Finance*, 13(2–3): 300–334.
- Graham, C., Cannice, M. and Sayre, T. (2002). 'The value relevance of financial and non-financial information for internet companies'. *Thunderbird International Business Review*, 44(1): 47–70.
- Gul, F. and Leung, S. (2004). 'Board leadership, outside directors' expertise and voluntary corporate disclosures'. *Journal of Accounting and Public Policy*, 23(5): 351–379.
- Hayes, R. (1998). 'The impact of trading commission incentives on analysts' stock coverage decisions and earnings forecasts'. *Journal of Accounting Research*, 36(2): 299–320.
- Hayn, C. (1995). 'The information content of earnings'. *Journal of Accounting and Economics*, 20(2): 125–153.
- Hirschey, M., Richardson, R. and Scholz, S. (2001). 'Value relevance of nonfinancial information: the case of patent data'. *Review of Quantitative Finance and Accounting*, 17(3): 223–235.
- Hirst, E., Koonce, L. and Simko, P. (1995). 'Investor reactions to financial analysts' research reports'. *Journal of Accounting Research*, 33(2): 335–351.
- Hodgson, A. and Stevenson-Clarke, P. (2000). 'Earnings, cashflows, and returns: functional relations and the impact of firm size'. *Accounting and Finance*, 40(1): 51–73.
- Hoff, B. and Wood, D. (2008). *White paper: Report on project findings – The use of non-financial information: What do investors want*. Boston College Center for Corporate Citizenship, 16pp.
- Holland, J. and Johanson, U. (2003). 'Value-relevant information on corporate intangibles – creation, use and barriers in capital markets – "between a rock and hard place"'. *Journal of Intellectual Capital*, 4(4): 465–486.
- Hong, H., Lim, T. and Stein, J. (2000). 'Bad news travels slowly: size, analyst coverage, and the profitability of momentum strategies'. *Journal of Finance*, 55(1): 265–295.
- Hossain, M., Ahmed, K. and Godfrey, J. (2005). 'Investment opportunity set and voluntary disclosure of prospective information: a simultaneous equations approach'. *Journal of Business Finance and Accounting*, 32(5–6): 871–907.
- Huber, G., Sutcliffe, K., Miller, C. and Glick, W. (1993). 'Understanding and predicting organizational change'. in Huber, G. and Glick W. (Eds.), *Organizational Change and Redesign*: 215–265, New York, NY: Oxford University Press.
- Hunton, J. and McEwen, R. (1997). 'An assessment of the relation between analysts' earnings forecast accuracy, motivational incentives and cognitive information search strategy'. *Accounting Review*, 72(4): 497–515.
- IASB. (2005). *International Financial Reporting Standards*. International Accounting Standards Board, London.
- Ittner, C. and Larcker, D. (1998). 'Are nonfinancial measures leading indicators of financial performance? An analysis of customer satisfaction'. *Journal of Accounting Research*, 36(3): 1–35.
- Jacob, J., Lys, T. and Neal, M. (1999). 'Expertise in forecasting performance of security analysts'. *Journal of Accounting and Economics*, 28(1): 27–50.
- Jensen, M. and Meckling, W. (1976). 'Theory of the firm: managerial behavior, agency costs and ownership structure'. *Journal of Financial Economics*, 3(4): 305–360.
- Jiraporn, P. and Gleason, K. (2007). 'Delaware incorporation and earnings management: an empirical analysis'. *Journal of Applied Finance*, 17(1): 40–51.
- Johanson, U. (2003). 'Why are capital markets actors ambivalent to information about certain indicators on intellectual capital?'. *Accounting, Auditing & Accountability Journal*, 16(1): 31–38.
- Jorge, M. and Rees, W. (1998). 'Agency issues and financial analysis in Spain'. Working paper, Universidad de Cad, 32pp.
- Juntilla, J., Kallunki, J.-P., Kärja, A. and Martikainen, M. (2005). 'Stock market response to analysts' perceptions and earnings in a technology-intensive environment'. *International Review of Financial Analysis*, 14(1): 77–92.
- Kallapur, S. and Kwan, S. (2004). 'The value relevance and reliability of brand assets recognized by U.K. firms'. *Accounting Review*, 79(1): 151–172.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R. (1997). 'Legal determinants of external finance'. *Journal of Finance*, 52(3): 1131–1150.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R. (1998). 'Law and finance'. *Journal of Political Economy*, 106(6): 1113–1155.
- LaFond, R. and Watts, R. (2008). 'The information role of conservatism'. *Accounting Review*, 83(2): 447–478.
- Lang, M. and Lundholm, R. (1993). 'Cross-sectional determinants of analyst ratings of corporate disclosure'. *Journal of Accounting Research*, 31(2): 246–271.
- Lee, S., Wong, P. and Chong, C. (2005). 'Human and social capital explanation for R&D outcome'. *IEEE Transactions on Engineering Management*, 52(1): 59–68.
- Leuz, C., Nanda, D. and Wysocki, P. (2003). 'Earnings management and investor protection: an international comparison'. *Journal of Financial Economics*, 69(3): 505–527.
- Lev, B. and Zarowin, P. (1999). 'The boundaries of financial reporting and how to extend them'. *Journal of Accounting Research*, 37(2): 353–385.
- Liang, C.-J. and 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.
- Libby, R., Bloomfield, R. and Nelson, M. (2002). 'Experimental research in financial accounting'. *Accounting, Organizations and Society*, 27(8): 775–810.
- Lipe, R. (1990). 'The relation between stock returns and accounting earnings given alternative information'. *Accounting Review*, 65(1): 49–71.
- Lui, D., Markov, S. and Tamayon, A. (2007). 'What makes a stock risky? Evidence from sell-side analysts' risk ratings'. *Journal of Accounting Research*, 45(3): 629–665.
- Maines, L. and McDaniel, L. (2000). 'Effects of comprehensive-income characteristics on nonprofessional investors' judgments: The role of financial-statement presentation format'. *Accounting Review*, 75(2): 179–207.
- Maines, L., Bartov, E., Fairfield, P., Hirst, D., Iannaconi, T., Mallet, R., Schrand, C., Skinner, D. and Vincent, L. (2002). 'Recommendations on disclosure of nonfinancial performance measures'. *Accounting Horizons*, 16(4): 353–362.
- Martikainen, M. (1997). 'Accounting losses and earnings response coefficients: the impact of leverage and growth opportunities'. *Journal of Business Finance and Accounting*, 24(2): 277–291.
- Moyer, R., Chatfield, R. and Sisnores, P. (1989). 'Security analyst monitoring activity: agency cost and information demands'. *Journal of Financial and Quantitative Analysis*, 24(4): 503–512.
- Noreen, E. (1988). 'An empirical comparison of probit and OLS regression hypothesis tests'. *Journal of Accounting Research*, 26(1): 119–133.
- Opdyke, J. (2000). 'Best on the street 2000 analysts survey: the winningest pros of them all'. *Wall Street Journal*, 25 July.
- Orens, R. and Lybaert, N. (2007). 'Does the financial analysts' usage of non-financial information influence the analysts' forecast accuracy? Some evidence from the Belgian sell-side financial analyst'. *International Journal of Accounting*, 42(3): 237–271.
- Paquette, L. and Kida, T. (1988). 'The effect of decision strategy and task complexity on decision performance'. *Organizational Behavior and Human Performance*, 16(2): 366–387.
- Payn, J., Bettman, J. and Johnson, E. (1992). 'Behavioral decision research: a constructive processing perspective'. *Annual Review of Psychology*, 43(1): 87–131.
- Perkins, W. and Rao, R. (1990). 'The role of experience in information use and decision making by marketing managers'. *Journal of Marketing Research*, 27(1): 1–10.
- Petra, S. (2007). 'The effects of corporate governance on the informativeness of earnings'. *Economics of Governance*, 8(2): 129–152.
- Plumlee, M. (2003). 'The effect of information complexity on analysts' use of that information'. *Accounting Review*, 78(1): 275–296.
- Press, E. and Weintrop, J. (1990). 'Accounting-based constraints in public and private debt agreements'. *Journal of Accounting and Economics*, 12(1–3): 65–95.
- Robb, S., Single, L. and Zarzeski, M. (2001). 'Nonfinancial disclosures across Anglo-American countries'. *Journal of International Accounting, Auditing & Taxation*, 10(1): 71–83.
- Rogers, R. and Grant, J. (1997). 'Content analysis of information cited in reports of sell-side financial analysts'. *Journal of Financial Statement Analysis*, 3(1): 14–30.
- Said, A., Hassab Elbany, H. and Wier, B. (2003). 'An empirical investigation of the performance consequences of nonfinancial measures'. *Journal of Management Accounting Research*, 15: 193–223.
- Saunders, M., Lewis, P. and Thornhill, A. (1997). *Research Methods for Business Students*. London: Pitman Publishing, 429 pp.
- Schipper, K. (1991). 'Commentary on analysts' forecasts'. *Accounting Horizons*, 5(4): 105–121.
- Skinner, D. (2008). 'Accounting for intangibles – a critical review of policy recommendations'. *Accounting and Business Research*, 38(3): 191–204.
- Stark, A. (2008). 'Intangibles and research – an overview with a specific focus on the UK'. *Accounting and Business Research*, 38(3): 275–285.
- Upton, W. (2001). *Special report on business and financial reporting, challenges from the new economy*. Norwalk, Connecticut, MA: Financial Accounting Standards Board, 118pp.
- Vafeas, N. (2000). 'Board structure and the informativeness of earnings'. *Journal of Accounting and Public Policy*, 19(2): 139–160.
- Vanstraelen, A., Zarzeski, M. and Robb, S. (2003). 'Corporate nonfinancial disclosure practices and financial analyst behaviour across three European countries'. *Journal of International Financial Management and Accounting*, 14(3): 249–278.
- Warfield, T., Wild, J. and Wild, K. (1995). 'Managerial ownership, accounting choices, and informativeness of earnings'. *Journal of Accounting and Economics*, 20(1): 61–91.
- Watts, R. and Zimmerman, J. (1990). 'Positive accounting theory a ten year perspective'. *Accounting Review*, 65(1): 131–156.
- White, H. (1980). 'Heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroscedasticity'. *Econometrica*, 48(4): 817–838.
- Womack, K. (1996). 'Do brokerage analysts' recommendations have investment value'. *Journal of Finance*, 51(1): 137–166.
- Yates, F. (1990). *Judgment and decision making*. Englewood Cliffs, NJ: Prentice Hall.
- Yeo, G., Tan, P., Ho, K. and Chen, S.-S. (2002). 'Corporate ownership structure and the informativeness of earnings'. *Journal of Business Finance and Accounting*, 29(7–8): 1023–1046.