

THE INTERTWINING OF FINANCIAL ANALYST BEHAVIOUR AND WEB-BASED PERFORMANCE TRANSPARENCY

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Abstract

The purpose of this study is to assess how a firm's disclosure regarding its web-based performance disclosure maps into financial analysts' earnings forecasts. We assert and empirically test that the determination of a firm's web-based performance disclosure and financial analysts' earnings forecasting work are closely intertwined processes. However, such endogeneity in capital markets' performance information dissemination and use is strongly influenced by a country's governance regime. On the one hand, North American countries (United States and Canada) exhibit a corporate governance regime that encompasses strong investor protection, largely diffuse corporate ownership and a focus on shareholder value creation. On the other hand, continental European countries (France, Germany, Belgium, the Netherlands) exhibit a corporate governance regime with weaker investor protection, a prevalence of large-block shareholding and significant input into the corporate decision-making process by non-shareholder groups such as labour and other social interest organisations. The continental European context will lead corporate managers to refrain from some disclosures and will attenuate the value of financial analysts' activities.

Our sample comprises 678 firms, with web-based performance information being collected from corporate web sites and analysts' earnings forecasts being obtained from IBES. Results from simultaneous equation regressions document significant interrelationships between financial analysts' activities and corporate disclosure transparency for North American firms. We observe that analyst following drives web-based performance disclosure and results in the web-based performance disclosure that reduces the dispersion of analysts' earnings forecasts. These results are consistent with the shareholder model of corporate governance. For continental European firms, no significant relationships emerges between web-based performance disclosure, analyst following and analyst forecasts' dispersion, although web-based performance disclosure related to intangible capital, and quantitative/monetary disclosure content are associated with market-to-book premium. Overall our results suggest that in continental Europe web-based performance disclosure is much less affected by financial market concerns than in North America, a result consistent with a less unilaterally focused stakeholder model of corporate governance.

Key words: Analyst following, analysts' forecasts, corporate governance, corporate disclosure, media exposure, performance disclosure, product market competition, web reporting.

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1. INTRODUCTION

Our purpose in this paper is to assess, and to compare, how North American and continental European firms choose the quality of their performance disclosure and how such disclosure affects financial analysts. More specifically, the paper assesses how web-based performance disclosure affects analysts' forecasts on three complementary aspects: (1) Does web-based performance disclosure convey new information to financial analysts? (2) Is the information content of web-based performance disclosure associated with the number of analysts following the firm? (3) How do the different governance regimes of continental Europe and North America affect financial analyst reaction to web-based performance disclosure? The paper is based on the premise that, while financial disclosure attracts considerable attention from the regulatory, media or financial communities, other socio-economic activities do provide relevant information to assess the firm's future economic prospects. Our theoretical framework essentially relies on the economics of corporate disclosure literature (e.g., Roberts 1992, Scott, 1994; Richardson and Welker, 2001). However, we extend such literature by mapping it into the political view of corporate governance put forward by Roe (2003) to explain between-continent differences.

Prior research documents that in many industries, there is a definite value creation process by which paper-based nonfinancial performance information is a lead indicator for future earnings, which, ultimately, translate into stock market performance (e.g., Amir and Lev, 1996; Iltner and Larcker, 1999). These findings imply that, in forecasting a firm's earnings, financial analysts should rely on performance information that extends beyond the firm's financial disclosures, such as the status of intangibles, customer satisfaction, corporate governance practices, risk management, product development and reliability, human capital, sustainable development, etc. Through a firm's web site, performance information can actually be provided on a continuous cost-effective basis. In that regard, there is limited understanding as to how firms determine their web-based performance

disclosure and how it affects and ultimately is affected by the behaviour of financial markets' participants such as shareholders and financial analysts, with financial analysts' forecasts proxying for the quality of managerial monitoring that is taking place (Leuz, 2003). As information intermediaries, financial analysts play a critical role in the functioning of capital markets and in the production of firm-specific information. Chang, Khanna and Palepu (2000) equate disclosure transparency (or the availability of firm-specific information) with robust analyst activity and accurate analyst forecasts.

However, for financial analysts, web-based performance disclosure may either represent relevant incremental disclosure or, may be simply an alternative information source that replicates disclosure that is available through other means (e.g., annual report). We ascertain this question by strictly focusing on how HTML format performance disclosure that is not mandated by regulatory agencies interfaces with analyst forecasts' dispersion and analyst coverage. Moreover, previous research (although mainly in the US) suggests that the properties of analyst earnings forecasts, the level of analyst following of a firm and the extent and quality of a firm's disclosure practices are to a significant extent simultaneously determined (Alford and Berger, 1999; Hope, 2003a). These simultaneous relationships imply considerable information dynamics at the firm level whereby the level and quality of the analyst services and the disclosure position of a firm influence each other.

Capital markets' information dynamics are likely to also be driven by political and institutional settings. Bushman, Piotroski and Smith (2004) report that financial reporting transparency varies across countries in ways that are consistent with their political regimes. Hence, an international perspective to examine whether the information dynamics surrounding corporate disclosure can be generalised to other institutional contexts seems warranted. More specifically, despite an abundance of prior empirical research, there is limited evidence regarding the comparative information dynamics of European and North American capital markets when the scope of disclosure extends beyond financial reporting. Comparing North American and continental European capital markets, significant institutional differences emerge. These differences are deemed to affect the way financial analysts interact with corporate disclosure information. For instance, differences in corporate governance mechanisms between continents will affect a company's disclosure strategy. Intrusive legislations that lead labour to be involved in

corporate governance as well as block ownership both provide less incentive for management to engage in high-quality corporate disclosure (Roe, 2003). In such a context, corporate disclosure is less likely to affect financial analysts' work.

There is extensive evidence that analyst forecasts in a North American context do impound quickly and efficiently any information that firms may convey about their future outlook (e.g., Lang and Lundholm, 1996; Bushman, Piotroski and Smith, 2004). The numbers involved, as well as the geographical dispersion of analysts in the United States, ensure that American firms face a critical audience when reporting to investors. Overall, some argue that, compared to continental European stock markets, the U.S. stock market is the most efficient in the way it collects and analyses information, the most liquid and the most transparent in matters of corporate disclosure (Saudaragan and Meek, 1997). Each continent's institutional context provides managers and analysts with differential incentives to either produce or use performance information. For instance, Pope (2003) suggests that the efficiency of analyst behaviour is not only a function of the quality of information disclosed and of the wider information environment (including accounting and disclosure rules), but also of available skills and incentives. Differential incentives and skills of financial analysts may affect the demand for and supply of company-specific information.

Our results from simultaneous equation regressions document significant interrelationships between financial analysts' activities and corporate disclosure transparency for North American firms. We observe that analyst following drives web-based performance disclosure and results in performance disclosure that tends to reduce the dispersion of analysts' earnings forecasts. The effect of performance disclosure on analyst forecasts' dispersion is substantiated for intangible capital disclosures and quantitative-monetary disclosure content. For continental European firms, no significant relationships emerge between performance disclosure, analyst following and analyst forecasts' dispersion, although performance disclosure related to intangible capital, and quantitative/monetary disclosure content are associated with market-to-book premium. Overall our results suggest that in continental Europe web-based performance disclosure is much less affected by financial market concerns than in North America, a result consistent with a less unilaterally focused stakeholder model of corporate governance.

Our research extends prior work on international corporate reporting on several dimensions. First, in contrast to most prior work that adopts a narrow financial performance focus, this study adopts a comprehensive definition of performance disclosure that encompasses all aspects of corporate performance. In our view, by taking into account a richer information set, such an approach better captures the process by which financial analysts determine their forecasts (Piotroski and Roulstone, 2004). Second, the study provides evidence as to the incremental financial markets' relevance of web-based performance disclosure, a timely measure that is less likely to be influenced by specific regulations that mostly affect paper-based financial disclosure (Cormier and Magnan, 2004). Such disclosure is not specifically mandated by regulatory agencies and the disclosure format makes it likely that the information is available only on the web and not also in paper form. Moreover, while it is true that securities regulators have oversight responsibilities over all of a firm's disclosure activities, their oversight is bound to be less tight for disclosures for which there is no specified form or content to rely upon. Third, the paper puts forward an integrated framework that maps the economics of corporate disclosure into the two continents' institutional governance contexts and that views corporate disclosure and related information dynamics as being endogenously determined (Roe, 2003). Fourth, the paper provides a comprehensive perspective to rationalize prior disparate findings on the determination of analyst forecasts' precision in the European context. More specifically, the paper allows additional insights into capital markets' information dynamics and its dependence upon the institutional context.

The remainder of the paper is organized as follows. Section 2 contains a theoretical framework for analysing the interdependence of financial analysts' behaviour and performance reporting, as well as research hypotheses. The study's methodology is described in section 3. Results are presented in section 4. Finally, section 5 provides a discussion of results' potential implication.

2. BACKGROUND AND HYPOTHESES

2.1 Performance Disclosure and Information Asymmetry

In light of their accountability toward a firm's shareholders, the board of directors and top management must provide shareholders with value-relevant information that impounds cost-benefit trade-off assessments. In that respect, management's incentive in disclosure

decisions is to minimize the firm's cost of capital (Richardson and Welker, 2001). For instance, by reassuring a firm's investors about various aspects of its operations or performance, expanded disclosure leads to a reduction in information asymmetry between managers and investors and, ultimately, to a reduction in *information costs* to be incurred by investors (e.g., Kim and Verrecchia, 1994). This, in turn, brings benefits to a firm by having investors lower its cost of capital, raise its valuation multiples and increase stock liquidity. It also translates in an enhanced interest by institutional investors (Healy, Hutton and Palepu, 1999).

The decision by a firm's management to disclose information about its underlying performance is likely to be influenced by a trade-off between the direct and indirect costs to be incurred for providing such disclosure and the benefits to be derived by the firm or its shareholders from such disclosure (Scott, 1994). On the one hand, a firm may decide to voluntarily disclose information if doing so is less costly than having investors and other market participants incur information costs themselves (Atiase 1985; Lang and Lundholm 1993; Milgrom, 1981; Roberts, 1992). For instance, firms which expansion is dependent upon continuous access to capital markets or firms that are widely followed by investors have incentives to reduce information asymmetry between managers and investors since such actions lower financing costs (Gibbins, Richardson and Waterhouse, 1990; Frankel, McNichols and Wilson, 1995; Clarkson, Kao and Richardson, 1994). On the other hand, a firm may decide to refrain from disclosing some aspects of its activities or performance if it provides outside parties with information that could be used to the firm's detriment (e.g., competitors, unions) (Scott, 1994; Darrough and Stoughton, 1990).

Overall, our emphasis on information quality is consistent with prior work in financial/non-financial disclosure (e.g., Botosan, 1997; Association for Investment Management and Research, 1992, 1993 and 2000; Healy, Hutton and Palepu, 1999; Lang and Lundholm, 1993 and 1996; Gibbins, Richardson and Waterhouse, 1990; Welker, 1995). It is our view that performance disclosure quality, more than its level, ultimately affects capital market participants. In this vein, we posit that web-based performance disclosure has an impact on the precision of financial analysts' earnings forecasts.

2.2 Performance Disclosure and Analysts' Forecasts

Liquid and efficient capital markets critically rely on market participants' ability to obtain, at low cost, timely and relevant information about firm performance. Previously, such relative properties of financial disclosure have been assessed from either investors' or analysts' perspectives. In this study, we will concentrate on the impact of performance disclosure on financial analyst behaviour. Analysts are considered to be sophisticated users of company information, and, unlike market expectations, their expectations are directly observable. Analyst forecasts' dispersion has been cited as a proxy for the quality of information about firm value (e.g. Daley, Senkow and Vigeland, 1988; Barron, Kim, Lim and Stevens, 1998). In forecasting future earnings, analysts face firms' economic uncertainties. In that respect, analysts can reduce uncertainties by relying on disclosed information about research and development projects, product market segments, employees' competence, and product quality provided this information has a predictive value. Information about corporate governance practices can also help analyst assess the reliability of a firm's performance disclosure (Bushman and Smith, 2003). Barron, Kile and O'Keefe (1999) show, and empirically test, that analyst forecasts' dispersion varies inversely with the quality of publicly available information (which is Management Discussion and Analysis in their case). Lang and Lundholm (1996), Higgins (1998) and Hope (2003a,b) provide empirical evidence that is consistent with more corporate disclosure leading to less analyst forecasts' dispersion. Thus, high quality disclosure by firm is likely to provide analysts with incentives to exert more effort, which will result in analyst information of a higher quality. Building on this relationship, analysts' forecasts have been used as a benchmark to evaluate one GAAP regime versus another (see Ashbaugh and Pincus, 2001).

On the other hand, in response to managerial accounting concerns, there is an emerging body of evidence which shows that non-financial performance measures may actually be useful in predicting a firm's future earnings and, ultimately, its stock market performance. Most of these studies are industry-specific since, in contrast to financial performance, there is no single generally accepted non-financial performance measure. For instance, in a seminal paper, Amir and Lev (1996) report that the number of customers signed up by a wireless operator, and its related costs, contain relevant information about future earnings and stock returns. Ittner and Larcker (1999) show that, in the context of some industries, non-financial performance measures are actually leading indicators of future financial performance measures such as sales or earnings that ultimately translate into enhanced

stock market performance. Behn and Riley (1999) report that in the airline industry, non-financial performance measures are critical signals about a firm's underlying economic performance and eventually translate into financial performance. Finally, Rajgopal, Venkatachalam and Kotha (2003) also provide evidence that some non-financial measures of business activity and success are actually associated with financial performance.

These findings regarding earnings predictability and information content of nonfinancial disclosure suggest that securities markets and accounting regulators should be concerned about the ways and means by which such information reaches investors and other capital markets' participants such as financial analysts. Moreover, such evidence also highlights the limited scope of prior research on the stock market implications from corporate disclosure. Thus, by strictly focusing on the association interaction between financial disclosure and analysts' forecasts, prior research may be omitting sources of information that are critical in the forecasting process, especially for firms in industries where such measures are widely reported outside of financial statements or standard financial disclosures. Since analysts have been shown to make proper use of high quality information, and since qualitative performance information has been shown to have predictive ability, we propose that analysts will rely on a broader scope of corporate disclosures when making earnings forecasts. To the extent that non-financial performance disclosures are informative about a firm's future prospects, we hypothesize that:

H1) Web-based performance disclosure reduces analyst forecasts' dispersion

Another component of a firm's information environment that may interact with a firm's disclosure policy is the extent of its analyst coverage. The effectiveness of analysts' monitoring, as well as market efficiency in a particular firm's shares, are enhanced if the number of analyst following the firm increases (Lang and Lundholm, 1996). Extensive analyst coverage, with low forecasts' dispersion, enhances a firm's stock market liquidity. Since stock market liquidity translates into a lower cost of capital (Healy and Palepu, 2001), firms have an incentive to increase their disclosure to attract more analysts and to reduce forecasts' dispersion. Prior evidence is consistent with analyst coverage being associated with less dispersion in analysts' forecasts (Lys and Soo, 1995; Hope,

2003a,b). From an information dynamics perspective, it is, a priori, difficult to ascertain if corporate disclosure and analyst coverage are complements or substitutes (Bushman and Smith, 2001). However, Hope (2003c) shows that analyst following essentially acts as a substitute for quality of financial disclosure. Moreover, in a similar vein, Botosan (1997) and Richardson and Welker (2001) report that for firms with few analysts, corporate disclosure does affect the cost of capital, but not for firms with extensive following. Hence, we expect the impact of non-financial, performance disclosure in explaining forecast consensus to vary with the number of analysts who follow the firm. This gives rise to the following hypothesis:

H2) Extensive analyst following weakens the association between the level of web-based performance disclosure and analyst forecasts' dispersion.

2.3 Governance regime, corporate disclosure and financial analysts' behaviour

Several studies document that institutional characteristics impact the information environment across countries (e.g., Ball, Kothari and Robin, 2000; Rajan and Zingales, 2003) and these may affect analysts' costs and rewards from collecting and interpreting corporate information. Capital markets' information dynamics are ultimately driven by a country's governance regime as it affects both the relative benefits and costs of information for disclosing firms and capital markets' users such as financial analysts, and the functioning of capital markets participants (Bushman and Smith, 2003). In other words, the quality of performance disclosure and the effectiveness of its use by stock market participants are joint outcomes of a country's governance regime (Roe, 2003: p. 40). The advantage of the governance-based framework that is proposed by Roe (2003) is that it presents an endogenous view of disclosure determination and capital markets' information dynamics, with both being determined simultaneously within the context of a particular legal and political governance regime. Essentially, Roe (2003) argues that a country's (or a continent's) political trade-offs and contexts drive its corporate governance landscape and override legal or financial factors. For instance, while ownership is highly concentrated in continental Europe, it is widely dispersed in the United States, and to a lesser extent Canada. Yet, each continent is socially and economically very advanced and sophisticated. Moreover, each continent has extensive legal protections for investors (although the severity of enforcement may differ). However, concentrated ownership appears necessary in Europe to ensure that managers act in stockholders' best interests

as many social legislations impose constraints or divergent interests on managers (e.g., workers' representatives on supervisory boards in Germany).

While there are various types of governance regimes, two are well-documented and actually encompass many countries: the stakeholder-based governance regime of continental European countries and the shareholder-based regime of North America (United States and Canada) (Buck and Shahrin, 2005; Dore, 2000). The stakeholder/shareholder model of corporate governance co-varies with the legal constraints under which capital market participants function. In this vein, La Porta, Lopez-De-Silanes, Shleifer and Vishny (1997, 1998) document that outside investor protection rights vary internationally. They provide evidence of a close relationship between outside investor protection rights and the legal origin of a country's governance regime. As such, La Porta et al. (1997, 1998) make a distinction between common or case law countries on the one hand and code or civil law countries on the other hand, with investor protection rights being one of the main differentiating factors.

Large and liquid equity markets, dispersed ownership and highly developed corporate governance mechanisms are joint outcomes of strong investor protection in common law countries. In these countries, financial accounting is oriented towards transparency and full disclosure with accounting and corporate taxation being separated. Stock markets dominate as a source of financing and as a driver for public reporting. Hence, financial reporting is typically aimed at fulfilling the information needs of investors. In code law countries, financial reporting is more oriented towards formal compliance with generally low level of disclosure and a strong alignment between accounting and taxation (Basu, Hwang and Jan, 1998). Financial institutions, government and large insiders dominate as a source of financing (Roe, 2003, p. 17).

Efficient capital market participants' functioning is typically leveraged when the legal environment sustains the enforceability of contracts with outside investors. For instance, Ball, Kothari and Robin (2000) document that accounting income in common law or shareholder-focused countries (e.g., Canada, USA) is significantly more timely than in code law countries (with "timeliness" defined as the extent to which current period accounting income incorporates current period economic income). This is however mainly due to quicker incorporation of economic losses ("conservatism"). In addition, accounting

earnings are more closely related to underlying economic activity (e.g. change in a country's gross domestic product) than in code law or stakeholder-based countries, such as France and Germany (Guenther and Young, 2000). Value relevance of earnings and book value of equity is generally higher in countries with a dominant market-oriented financing system and an Anglo-Saxon accounting orientation (Ali and Hwang, 2000). Overall, it does appear that providing value-relevant information is not the primary driver of accounting and disclosure in code law countries.

The stakeholder-based governance regime that is typical of continental European countries is characterized by a legal and regulatory framework that protects stakeholders others than stockholders, weak minority shareholders' rights, intrusive employees' rights and involvement, the prevalence of blockholders' ownership, large and ineffectual boards and extensive bank influence (La Porta, Silanes and Shleifer, 1999). In such a context, managers are not likely to be closely monitored by boards of directors. Instead, blockholders circumvent formal monitoring processes and deal directly with managers to minimize conflicting influences by other stakeholders. The resulting corporate disclosure is typically of lower quality as blockholders do not want other stakeholders to possess information that would facilitate their intervention into corporate affairs beyond their already extensive statutory roles (Roe, 2003, p. 32).

In contrast, the shareholder-based governance regime that is typical of North America is characterized by a legal and regulatory framework that emphasizes the firm's obligations toward its shareholders, flexible labour laws, diffuse ownership and a more limited short-term financing role for banks (Roe, 2003, pp. 137-140). In such a context, directors are mandated explicitly to pursue shareholder value maximization as a goal and to monitor managers accordingly. Corporate disclosure is of relatively high quality to ensure directors' and managers' accountability and to convey to shareholders information that allows them to better value the firm. Furthermore, the cost of disclosing information that may be captured by other stakeholders is minimized since non-shareholders are not formally involved in the firm's governance: their interaction with the firm is through contractual arrangements on open markets. As a result, stock market participants are likely to rely on such disclosure for their investment decisions.

As financial analysts are an integral part of the information dissemination process in capital market, the imperfect provision and use of available information would be reflected in the way they function, and in the quality of their forecasts. Clement, Rees and Swanson (2003) offer evidence of the impact of cultural and institutional (governance systems and financial reporting environments) differences on the efficiency of analyst functioning. Their evidence indicates that the weighted average forecast error in code law countries is almost double that of common law countries and shows that the effect of analysts' attributes such as experience, research support and specialization on the properties of their forecasts varies across countries. They argue that in code law countries the institutional environment makes information search efforts of financial analysts less rewarding, whereas, on the supply side, management has less incentive to share information with analysts or may show favouritism to analysts representing large equity investors. However, even more importantly, the efficiency of analyst functioning in capital markets may itself be a reflection of the institutional characteristics of the governance regime in which they operate. As the major capital market intermediaries, their role and behaviour are largely affected by the imperfections and constraints of the capital market and by the complexity of the regulatory environment in which they operate. Bolliger (2004) argues that European financial analysts face a labour market that does not provide them incentives to produce excellent forecast track records, rewarding analysts for other criteria than the quality of their forecasts. In the US, because of the prevalence of the CFA (Chartered Financial Analyst) designation, the North American financial analysts' sector is fast becoming a profession in which individual analysts adhere to similar ethical and professional standards as set by the CFA. Moreover, the link between career concerns and US analyst behaviour has been demonstrated to be very important, creating a competitive labour market that provides financial analysts incentives to produce high-quality forecasts (Hong, Kubik and Salomon, 2000). Capstaff, Paudyal and Rees (1998) observe that, in Germany, analysts' forecasts made more than seven months before year-end are less accurate than a naive prediction model. In contrast, UK analysts' forecasts are superior to naive prediction models within a sixteen months' horizon prior to year-end. They suggest that this relative inefficient forecasting is difficult to explain other than by a lack of institutional and investor interest. Orpurt (2004) also argues that in Europe analyst behaviour is somewhat impeded by differences in local languages, customs and market diversities creating significantly more variance in information asymmetry between analysts in continental Europe than in North America. There is some empirical evidence

that information disclosure by continental European firms and information gathering by analysts does not emphasize formal performance disclosure. For instance, Bayens, Manigart and Verschueren (2003) show that in continental European countries, venture capitalists rely on informal information to value firms and do not rely on formal communications by a firm. Such informal information includes entrepreneur personalities, personal preferences, etc. In addition, Vanstraelen, Zarzeski and Robb (2003) report that, for Germany, Belgium and the Netherlands, historical non-financial disclosures has no effect on forecasts accuracy and dispersion, with forward looking non-financial disclosures actually having a negative impact on dispersion.

Such differences in the overall governance regimes between North America and continental Europe do imply differences in demand for, and thus in the process by which firms determine performance disclosure and in the way financial analysts impound such disclosure into their forecasts. More precisely, we propose the following differential hypothesis:

H3a) Web-based performance disclosure by European firms has less impact on analyst forecasts' dispersion than in North American firms.

H3b) Web-based performance disclosure by European firms is less associated with analyst following than in North American firms.

3.0. METHODOLOGY

3.1 Sample

The sample comprises 267 continental European firms (43 from Belgium, 97 from France, 84 from Germany, 43 from Netherlands) and 627 North American firms (208 from Canada and 419 from U.S.). All non-financial firms represented on Euronext (SBF120; DAX70/DAX30; Euronext Brussels-50 biggest market capitalization¹; AEX/MIDKAP- 48 firms) and S&P500 (U.S.) and S&P/TSX300 (Canada). Our measure of web-based performance disclosure comprises 101 items that are grouped in seven components:

¹ In Belgium, we expanded the BEL-20 index companies to the 50 largest companies in terms of market capitalization.

Financial; corporate governance; customer value; human and intellectual capital; production efficiency; innovation, development and growth; and social responsibility. performance disclosure is coded from these firms' Internet site for the year 2002 (web page and HTML). Financial data is collected from Worldscope and from firms' Internet sites. Earnings forecasts' estimates and analysts following data are collected from IBES.

Sample firms operate in the following industries (S&P classification): Consumer goods and services; Energy; Chemicals & Drugs; Industrials; Information technology; Materials (resources); Telecom & Media; and Utilities.

3.2 Empirical models

This study attempts to provide an integrated analysis of firms' overall web disclosure strategy. We posit that this strategy affects simultaneously web-based performance disclosure, analyst following and the properties of financial analysts' forecasts. It is thus important to actually control for the presence of endogeneity between our critical variables (web-based performance reporting, analyst following and forecasts' dispersion). Given our contrasting perspective, we test for the total sample and for North America and Europe separately. To control for endogeneity, a three-stage least square model is used.

The following structural equations model summarizes the approach to be adopted in the empirical analysis:

Analyst forecasts' dispersion_{it} =

$$f(\text{Beta, Analyst following, Change in earnings per share, Negative earnings per share, Web-based performance disclosure, Web-based performance disclosure*Analyst following})_{it} \quad (2.1)$$

Web-based performance disclosure_{it} =

$$f(\text{Analyst following, Stock exchange listings, Concentrated ownership, Profitability, Leverage, Capital investment intensity, Concentration ratio, Media exposure, Firm size, Market-to-book, Country})_{it} \quad (2.2)$$

Analyst following_{it} =

$f(\text{Web-based performance disclosure, Foreign listings, Concentrated ownership, Leverage, Size, Market-to-book, Beta, Industry, Country})_{it}$ (2.3)

3.2.1 Variables description

A) Determinants of analyst forecasts' dispersion

Besides our performance disclosure measures, the following variables are introduced as determinants of analyst forecasts' dispersion.

Analyst following. A firm's analyst following is used as a proxy for the level of other disclosures and the extent of a firm's communication with financial analysts (Leuz, 2003). Analyst forecasts' performance is likely to improve, as more information about a company is processed and disclosed by analysts (Alford and Berger, 1999). A negative association between analyst following and forecasts' dispersion is expected.

Absolute change in earnings per share and Beta. Variability in earnings increases the difficulty of forecasting. So, a positive association is expected between the level of earnings change and forecasts' dispersion. The same reasoning applies for beta that measures the inherent uncertainty in predicting earnings. A negative relationship is expected between beta and analyst forecasts' dispersion.

Negative earnings. We expect that forecasting earnings is more difficult for companies that experience losses. We use an indicative variable for negative earnings and anticipate a positive relationship between this binary variable and forecasts' dispersion (Hope, 2003a,b).

Additionally, we control for industry and country effects on analyst forecasts' dispersion. Chang, Khanna and Palepu (2000) demonstrate that country level institutional factors such as legal and information infrastructure have a first-order effect on the precision of analyst forecasts. Industry characteristics are also expected to affect the complexities of earnings forecasting.

B) Determinants of web-based performance disclosure

Web-based performance disclosure

Web-based performance disclosure comprises seven components: Financial; corporate governance; customer value; human and intellectual capital; production efficiency; innovation, development and growth; and social responsibility. Appendix 1 provides a detailed listing of coding items.

Performance disclosure indicators, financial or non-financial, are based on balance scorecard literature and emerging performance measurement practices (e.g. Standard & Poors, 2002 for financial and governance disclosure; Pirchegger and Wagenhofer, 1999, and Marston and Polei, 2004, for investors, governance and social responsibility disclosures; Kaplan et Norton, 1996, Ittner and Larcker, 1998 and Robb, Single and Zarzeski, 2001, for indicators about operations' efficiency, value for client, innovation, development and growth). We measure performance reporting using a coding instrument in a way that is similar to Wiseman (1982) and Cormier and Magnan (2003). The grid comprises 101 items. The 101 performance disclosure items are grouped into seven categories: financial performance; corporate governance; customer value; human and intellectual capital; production efficiency; innovation, development and growth; and social responsibility. The rating is based on a score of one to three, three for an item described in monetary or quantitative terms, two when an item is described specifically and one for an item discussed in general. The potential relevance and usefulness of monetary or quantitative disclosure are generally perceived to be higher than that of qualitative and descriptive disclosure (Bryan, 1997; Ahmed, Kilic and Lobo, 2005; Ghozzi, 2005). As we expect that analysts are likely to impound more rapidly additional information of quantitative/monetary nature in their decision models than qualitative information, disclosure content of the three different quality levels will also be analysed separately to explore the impact of information quality on the hypothesized relationships.

The use of coding scale to qualify a firm's performance disclosure is deemed appropriate for the following reasons. First, it allows for some integration of different types of information into a single figure that is comparable across firms in terms of relevance. Second, while other disclosure studies rely on word counts to measure performance disclosure (e.g., Neu, Warsame and Pedwell 1998; Williams and Ho Wern Pei, 1999), a

qualitative scale allows for the researcher's judgment to be impounded in rating the value or quality of the disclosure made by a firm. While this process is more subjective, it ensures that irrelevant or redundant generalities are not considered strategic performance disclosure.

To ensure consistency across firms, two persons coded all individual websites independently. All disagreements were subsequently reviewed by one of the co-researchers.

Information costs and benefits

Since costs being incurred by shareholders to collect information as well as potential costs resulting from the disclosure of proprietary information are not directly observable, we rely on a set of proxy variables that capture the extent of such costs and the firm's financial condition. Similarly, public pressures are represented by the extent of firm's media exposure.

Five variables are used to capture information incentives and costs with respect to a firm's performance disclosure:

Analyst following. A firm's analyst following is often used as a proxy for the level of other disclosures and the extent of a firm's communication with financial analysts (Leuz, 2003). Moreover, Lang and Lundholm (1996) and Healy, Hutton and Palepu (1999) find a positive relation between analyst following and the quality of a firm's disclosure. Hence, we expect a positive relation between analyst following and actual performance disclosure (Khanna, Palepu and Srinivasan, 2004).

Stock exchange listings. Listings in many stock exchanges are meant to capture disclosure pressures internationally (Leuz and Verrecchia, 2000). Dechow, Gray and Rashman (2002) find that in addition to firm's size, listing on US exchange is a specific determinant of Internet financial reporting. Based on Hope (2003a), listing on a domestic exchange and on foreign exchanges (except U.S. listings and London) are given a weight of 1 per listing while U.S. listings and London stock exchange are given a weight of 1.5 because of their importance. The score for each firm is summed. The disciplining aspects

of listing on a foreign exchange should be greater for continental European companies, as US and Canadian listings require already more and more detailed disclosure than the continental European markets. We expect a positive association between the variable stock exchange listing and performance disclosure.

Barriers to entry are items that constitute a cost that a new entrant would have to face compared to existing companies. These include cost in making capital investment intensity, existing intellectual property rights that make entry difficult, and industry concentration. Dye (1985) asserts that an incumbent firm with good news to communicate may choose to withhold information to prevent competition. The lower the market competition, the easier a firm can keep private information (Verrecchia, 1983). In the opposite, Darrough and Stoughton (1990) assess that the more it is difficult to enter a market, the more confident the incumbents will feel about disclosing information.

Two variables are used to capture product market concerns with respect to a firm's performance disclosure:

Capital investment intensity. We use a well-known measure of entry barriers: the level of capital investment as measured by gross property, plant and equipment as expressed in percentage of total assets. We expect that the level of capital investment intensity, as measured by the ratio of gross property, plant and equipment divided by total assets, is associated with performance disclosure. Since the actual impact of product market competition on performance reporting is unclear, no directional predictions are made for this variable.

Concentration ratio. As a second proxy for barriers to entry, we will use the concentration ratio, i.e. an indicator of the relative size of firms in relation to the industry as a whole. It is common to use the four-firm concentration ratio, which consists of the percentage of market share owned by the largest four firms in the industry. In contrast to the first proxy, which is firm-specific, the concentration ratio approaches the notion of barriers to entry from an industry-wide perspective. Again, since the actual impact of product market competition on performance reporting is unclear, no directional predictions are made for this variable.

Concentrated ownership. Firms with closely-held ownership are not expected to be responsive to public investors' information costs since the dominant shareholders typically have access to the information they need (Ball, Robin and Wu, 2003; Hope, 2003c) and do not want or need to share it to other stakeholders such as employees (Roe, 2003). Concentrated ownership is measured as a dichotomous variable taking a value of one (1) when an investor, or a related group of investors, owns more than 20% of a firm's outstanding voting shares, and zero (0) otherwise.² A negative relationship is expected between concentrated ownership and performance disclosure.

Financial condition

The magnitude of potential costs a firm faces because of disclosure is difficult to assess since it requires the identification of all parties that may use the information to the firm's detriment. However, a firm's financial condition does provide a measure of its willingness to release information since only firms that are financially sound may be able to trade off the benefits from additional disclosure with the costs of revealing potentially damaging information. In contrast, firms in poor financial condition may be unable to withstand the initial negative consequences that are needed to gain any benefits from more extensive disclosure.

Two variables proxy for a firm's financial condition:

Profitability. Many studies document a positive association between a firm's level of disclosure and its financial performance (Mills and Gardner, 1984; Cochran and Wood, 1984; McGuire, Sundgren and Schneeweis, 1988; Cormier and Magnan, 2003). A positive relationship is expected between profitability, as measured by return on assets, and web-based performance disclosure.

Leverage. Firms in poor financial condition may be unable to withstand the initial negative consequences that are needed to gain any benefits from more extensive disclosure. Thus, consistent with prior findings (McGuire, Sundgren and Schneeweis, 1988; Cormier and Magnan, 2003), it is expected that there is a negative relationship between a firm's

² According to International Accounting Standards (IAS No. 28, 2000), an ownership stake of 20% defines significant influence over a firm's affairs.

leverage as measured by Long term financial debt/Equity and web-based performance disclosure.

Control Variables

Four variables are introduced as control variables in the analysis: Firm size; Market-to-book ratio; Media exposure and Country.

Firm Size. Prior evidence is consistent in highlighting a positive relation between the extent of corporate disclosure and firm size (Scott 1994; Cormier and Magnan 2003; Neu, Warsame and Pedwell, 1998, Leuz and Verrecchia, 2000; Debreceeny, Gray and Rashman, 2002). Firm size, measured as the log of Assets, is introduced as a control variable, with a positive relation being expected between firm size and the extent of performance disclosure.

Market-to-book value. Market premium is used as a proxy for the extent of intangible assets not accounted for in traditional financial statements. There is prior evidence suggesting that firms in high technology exhibit higher market-to-book ratios (Frankel, Johnson and Skinner, 1999). The demand for intellectual capital information is higher in companies with a higher market-to-book ratio. This is especially so for financial analysts. Amir, Lev and Sougiannis (2003) and Barron, Byard, Kile and Riedl (2002) provide evidence that for companies owning significant intangibles, financial analysts supplement in their reports financial information and place relatively greater emphasis on their own private information. In turn, they will put pressure on management to be provided with this information. We expect that the higher the level of intangible capital as proxied by market-to-book ratio, the higher is the level of the firm's performance reporting.

Media exposure. To legitimize their firm's activities, managers must be able to assess and react to public pressures. In other words, they need to assess the nature and scope of the comments expressed by the public regarding the firm's activities. One such outlet is the media. Media attention, e.g., press coverage, directly underlies public pressures managers may feel regarding their firm's activities (Brown and Deegan, 1998). It is expected that managers, in an effort to legitimize their actions, will react to such increased pressure by increasing the extent of web-based performance disclosure.

The degree of exposure of the firm in the international publications (database ABI Inform) is proxied by taking the average of number of articles for the period 1997 through 2001. The reason for this choice is because disclosure this year (2001) may be affected by the amount and types of articles that have been published about a firm in the recent past. We expect that as media exposure increases, the firm will increase its performance reporting. A positive relation is expected between Public Pressures and the extent of web-based performance reporting.

Country. Dummy variables are used to control for country effects.

C) Determinants of analyst following

Since analyst following and forecast dispersion are not likely to be exogenous (Lang, Lins and Miller, 2003), it is thus important to assess the determinants of a firm's analyst coverage and as such to include web-based performance disclosure as a determinant.

Performance disclosure. Prior research shows that analyst coverage tends to be positively related to the degree of information disclosure by a company, presumably because better disclosure decreases the cost of doing research on a company (Lang and Lundholm, 1996; Healy, Hutton and Palepu, 1999). Hence, analysts are less likely to be attracted to firms with poor disclosure (Lang and Lundholm, 1996; Healy, Hutton and Palepu, 1999; Bushman and Smith, 2003).

Foreign listings. We also expect that foreign listings will potentially influence the demand for analysts' services. Lang, Lins and Miller (2003) find that firms that are cross-listed on the US exchanges have greater analyst following than firms that are not cross-listed. Foreign listing is likely to stimulate activity by analysts in the foreign country, adding to the domestic supply of analysts' services. In addition, since foreign investors are likely to experience greater information asymmetry than domestic investors, they create greater demand for analysts' research. From the supply side, analysts may be more inclined to follow cross-listed firms since these firms are more likely to attract a larger investor base.

Concentrated ownership. There is likely to be a greater demand for analysts' services if ownership is more widely dispersed. As Hope (2003c) posits, when ownership is concentrated, information is likely to be communicated through private channels, decreasing the role of financial analysts. Moreover, Lang, Lins and Miller (2004) argue that analysts are unwilling to follow firms with potential agency problems. They document that analyst coverage is negatively related to the control rights held by family or management groups.

Leverage. In contrast to well-capitalized firms, indebted firms rely less on equity markets to raise capital. Hence, this reduces their appeal and value for analysts. Therefore, we expect a negative relation between leverage and analyst following.

Size. Prior research on analyst following in the US shows that firm's size is positively related to analyst following. Bhushan (1989) argues that company size affects both the aggregate demand and the aggregate supply for analysts' services. Demand is positively affected by company size because the aggregate potential payoff for shareholders from access to higher quality information is more important for larger firms. Supply is positively affected, presumably because there are significant fixed costs in following a company and the payoff from following is related to its size (Bhushan, 1989).

Market-to-book. Analyst coverage has been shown to be related to Tobin's Q (Lang, Lins and Miller, 2003). The demand for analyst services will generally be higher in high-intangibles firms, where the informativeness of financial reports is relatively lower. (Amir, Lev and Sougiannis, 2003; Barth, Beaver and Landsman, 2001). Since Market-to-Book is often used as a proxy for the level of intangibles, we expect a positive relation between market-to-book and analyst following.

Beta. Prior research documents a relation between stock volatility and analyst coverage (e.g. Bhushan, 1989; Lang, Lins and Miller, 2003), suggesting that demand for analysts' services is higher for companies with higher financial risk. Therefore, we expect a positive relationship between beta and analyst coverage.

Industry membership. Industries are not likely to equally attract financial analysts. Hence, dummy variables are used to control for industry effects. Sample firms are grouped according to S&P500 classification mentioned earlier (eight industries).

Country. Chang, Khanna and Palepu (2000) provide evidence that country level institutional variables affect the availability of analyst forecasts. Hence, we introduce country dummies to control for country effect.

3.2.2 Variables Measurement

Variable	Measure
Analyst Forecasts' Dispersion:	IBES standard deviation of forecasted EPS for year 2003 (collected in May 2003 after the release of 2002 annual earnings). ³
Beta:	Systematic risk in 2002.
Analyst following:	Number of analysts following a firm in 2002.
Change in earnings per share:	Absolute value (Percentage change in EPS for year 2002 versus EPS for year 2001).
Negative Earnings:	Dummy variable if loss in 2002. same
Web-based performance disclosure:	Score based upon a content coding of the quality of the web-based performance information being available on a firm's web site in 2002.
Industry:	Dummy variable for each broad industrial sector.
Country:	Dummy variable for each country.
Stock exchange listing:	Based on Hope (2003a), listing on a domestic exchange and on foreign exchanges (except U.S. listings and London) are given a weight of 1 per listing while U.S. listings and London stock exchange are give a weight of 1.5 because of the importance. The score for each firm is summed up for 2001.
Concentrated ownership:	Dummy variable taking a value of one (1) when an investor, or a related group of investors, owns more than 20% of a firm's outstanding voting shares, and zero (0) otherwise. ⁴
Profitability:	Return on assets in 2001.
Leverage:	(Long term financial debt)/(Equity) at year-end 2001.
Capital intensity:	Gross property, plant and equipment as expressed in percentage of total assets in 2001.
Concentration ratio	Four-firm concentration ratio, which consists of the percentage of market share owned by the largest four firms in the industry in 2001.
Media Exposure	Average number of articles in international publications that are surveyed by ABI Inform for the period 1997 through 2001.
Firm Size	Ln(Total Assets) as of year-end 2001.
Market-to-book	(Stock market value)/(Stockholders' Equity) as of year-ends 2001 (web-based performance disclosure regression) and 2002 (market-to-book regression).

³ Analysts' dispersions were collected at beginning of May 2003 for 239 European firms and for 556 North American firms. Observations with an absolute values greater than three on the dispersion measure, when the firm is followed by less than two analysts (11 + 12 for European firms and 16 + 50 for North American firms) were excluded from analyses. There were also seven observations with missing data for European firms and 19 for North American firms. The final sample is 209 for continental European firms and 471 for North American firms. Moreover, scaling the forecast dispersion variable by average stock price does not alter our results.

⁴ According to International Accounting Standards (IAS No. 28, 2000), an ownership stake of 20%

4. RESULTS

4.1 Descriptive statistics

Descriptive statistics are presented in table 1. On average, North American firms exhibit higher web-based performance disclosure than continental European firms on all disclosure components, with the exception of financial performance reporting. Internal consistency estimates (Cronbach's alpha) show that the variance is quite systematic, the less systematic being social responsibility disclosure (0.72).⁵ For the total score based on seven components, Cronbach's alpha is 0.74. This is higher than Botosan (1997) who finds an alpha of 0.64 for an index including five categories of disclosure in annual reports.

[Insert table 1]

As illustrated in Table 2, the average level of web-based performance disclosure by industry varies from a score of 74 for Consumer goods and services to 114 for Telecom and media. Among the seven disclosure components, Customer value (19.13) exhibits the highest score, followed by corporate governance (15.69) and social responsibility (13.71). The lowest score relates to disclosure on Production efficiency (6.55).

[Insert table 2]

Table 3 provides some descriptive statistics about sample firms' financial variables and the level of media exposure. Firms' size is on average larger for U.S. and German firms. France and U.S. firms show higher systematic risk while Benelux and Canadian firms present lower risk. More than half of sample firms have a concentrated ownership in France while the free float is quite high in U.S. Canadian firms are less followed by analysts than their American and continental European counterparts. Finally, U.S. firms exhibit a much higher market-to-book ratio compared to other country firms.

defines significant influence over a firm's affairs.

⁵ A Cronbach's alpha estimates the proportion of variance in the test scores that can be attributed to true score variance. It can range from 0 (if no variance is consistent) to 1.00 (if all variance is consistent).

[Insert table 3]

4.3 Multivariate results

Since we posit that a firm's information dynamics affect performance disclosure and financial analyst forecasts and analyst following simultaneously, we first assess whether or not endogeneity exists between these variables using a Hausman test. Using this procedure, we reject the null hypothesis of no endogeneity with respect to total performance disclosure and analyst forecasts' dispersion ($p < 0.023$), total performance disclosure and analyst following ($p < 0.001$), and analyst following and analyst forecasts' dispersion ($p < 0.061$).⁶

4.3.1. Disclosure and analyst forecasts' dispersion - Continental Europe versus North America (total disclosure)

Table 4 panel A provides evidence regarding the simultaneous test of performance disclosure, analyst following and forecasts' dispersion for continental European firms and for North American firms separately. Concerning the impact of performance disclosure on analyst forecasts' dispersion, results do not show a significant statistical relationship between performance disclosure and forecasts' dispersion, either in continental Europe or in North America.

Table 4 panel B provides evidence regarding the simultaneous test of web-based performance disclosure, analyst following and forecasts' dispersion, restricting disclosure to monetary/quantitative content. Concerning the impact of performance disclosure on analyst forecasts' dispersion, consistent with H1, we document a negative relationship between performance disclosure and forecasts' dispersion for North American firms

6 In 3SLS regressions, all dependent variables are explicitly endogenous to the system and as such are treated as correlated with the disturbances in the system's equations. All exogenous variables are used as instruments. In the case that regressions and error terms are not related, i.e. absence of endogeneity, 3SLS will produce the same estimates as OLS. Therefore, if any of the endogeneously specified variables are in fact exogeneous, the 3SLS is still appropriate (Judge, Griffiths, Lütkepohl, and Lee, 1988, p. 655).

(-0.014; $p < 0.01$). However, such a relationship is not observed for continental Europe. Furthermore, the coefficient for the interaction term performance disclosure*Analyst following is positive and significant suggesting that performance reporting has a greater impact on forecasts' precision for firms followed by few analysts, thus supporting H2 (0.001; $p < 0.01$). However, there is still no significant statistical evidence of relevance of performance disclosure for analyst forecasts in continental Europe. Moreover, consistent with H3a, there is a difference between continental Europe and North America regarding the impact of web-based performance disclosure on analyst forecasts' dispersion ($t = 1.31$; $p < 0.10$).

4.3.2. Disclosure and analyst forecasts' dispersion - Continental Europe versus North America (disclosure components)

The analysis reported above suggests that the type of disclosure being provided by firms (i.e., quantitative or monetary vs. qualitative) may affect the relation between performance disclosure and analyst forecasts' dispersion. However, performance disclosure can also be characterized in terms of the aspects of a firm's performance that are emphasized, different firms potentially emphasizing different aspects of their performance. Therefore, a principal components factor analysis (Varimax Rotated Component) is performed on the seven performance disclosure components and industry dummies to identify performance disclosure patterns across firms. Three factors emerge. A first factor comprises reporting about innovation, development and growth in addition to reporting about customer value as well as operations' efficiency and human/intellectual capital, thus emphasizing performance information about intangible capital. Firms exhibiting these reporting attributes typically face extensive media exposure and have large financial analyst followings. A second combination concerns financial performance disclosure, and corporate governance practices, essentially financial oriented disclosure. Finally, social responsibility disclosure appears as a separate factor that is driven by firms operating in Consumer goods and services, Natural resources, Energy, and Utilities, essentially environmentally sensitive industries. The same three patterns emerge when we run a K-mean cluster analysis on the seven performance disclosure components.⁷

⁷ Both in continental Europe and in North America, separate clusters emerge for financial/Governance, and Social responsibility.

Based on this analysis, we estimate regressions on two separate groupings: Financial/Governance oriented disclosure and Intangible capital oriented disclosure. Moreover, as a sensitivity analysis, a separate analysis is done on social responsibility disclosure. Regression results from these two groupings are shown in panels A and B of Table 4.

Financial/Governance disclosure

Table 4 panel A provides evidence regarding financial oriented disclosure (Financial and corporate governance). Results are entirely consistent with those shown for total disclosure.

In panel B, consistent with H1 and with total disclosure monetary/quantitative content analyses, we document a negative relationship between financial oriented disclosure (monetary/quantitative content) and forecasts' dispersion for North American firms (-0.023; $p < 0.01$). Furthermore, and consistent with H2, the coefficient for the interaction term performance disclosure*Analyst following is positive and significant (0.001; $p < 0.01$). This result suggests that performance reporting has a greater impact on forecasts' dispersion for firms followed by few analysts. However, there is still no significant statistical evidence of relevance of financial oriented disclosure for analyst forecasts in continental Europe. Consistent with H3a, there is a difference between continental European and North American firms regarding the relevance of financial oriented disclosure for analyst forecasts ($t = 1.42$; $p < 0.10$).

Intangible capital disclosure

Concerning intangible capital oriented total disclosure, panel A shows that performance disclosure is related to analyst forecasts' dispersion for North American firms (-0.006; $p < 0.01$), a finding that is consistent with H1. Moreover, in contrast to expectations, there is no statistically significant difference between European and North American firms.

Focusing on quantitative or monetary disclosure, performance disclosure is negatively related with forecasts' dispersion for North American firms (-0.040; $p < 0.01$) but not for European firms. Such findings are consistent with H1 and with H3a. Moreover, consistent with H2, the interaction term Intangible Capital Disclosure*Analyst following is positive for

North American firms, thus suggesting that web-based performance reporting has a greater impact on forecasts' dispersion for firms followed by few analysts.

[Insert table 4 panel A and panel B]

5.3.3. Determinants of web-based performance disclosure and analyst coverage

Table 5 provides results from simultaneous equations analyses of the determinants of total web-based performance disclosure and analyst following in both continental Europe and North America. Consistent with H3b, performance disclosure by continental European firms (0.053; $p > 0.10$) is less driven by analyst following than North American firms (1.723; $p < 0.01$), the difference being statistically significant ($t = 2.073$; $p < 0.05$). Media exposure is an important determinant of performance disclosure in both continental Europe (0.376; $p < 0.01$) and in North America (0.118; $p < 0.01$). Analyst coverage is related to Systematic risk, Size, Stock listings, web-based performance disclosure (North America), and Market-to-book premium (continental Europe), and, to a lesser extent, Concentrated ownership. Stock listings is not an important determinant of analyst coverage in North America. It is likely that being listed at a U.S. stock exchange is sufficient to attract analysts. Moreover, performance disclosure does not seem to attract financial analysts in continental Europe.⁸ Finally, although not hypothesized, table 5 shows that web-based performance disclosure is a significant determinant of analyst following in North America but not in continental Europe. This result would suggest that while voluntary disclosure seems to attract analysts in the North America context, in continental Europe, analyst demand for high quality disclosure does not seem to drive voluntary web-disclosure.

[Insert table 5]

4.3.3. Sensitivity analysis

First, to assess the robustness of our results, we replace analyst forecasts' dispersion by market-to-book ratio. Since our intent is to assess if web-based performance disclosure

⁸ Models estimated separately for financial oriented disclosure and intangible capital provide similar results.

convey incremental information to stock market investors in their interpretation of a firm's financial statements, we rely on an empirical model that incorporates both the balance sheet and the income statement. Such an approach is consistent with prior empirical work (Amir, 1993; Harris and Muller, 1999):

$$\text{Market-to-book premium}_{it} = \beta_0 + \beta_1 1/\text{Equity}_{it} + \beta_2 \text{Earnings/Equity}_{it} + \beta_3 \text{Web-based performance disclosure}_{it} + \beta_4 \text{Negative Earnings (1/0)}_{it} + e_{it}$$

We focus on monetary/quantitative content. Table 6 presents results of a 3SLS regression for total score using Market-to-book premium in place of analyst forecasts' dispersion. The results are generally consistent with those observed using analyst forecasts' dispersion (and presented in table 4 panel B). For North American firms, as expected, the coefficient of performance disclosure is positive and highly significant (0.063; $p < 0.01$) (H1). For continental European firms, again, results suggest that performance disclosure do not convey incremental information to stock market investors since the disclosure variable is not significant (0.013 $p > 0.10$). Consistent with H3a, t-statistics of coefficient difference between European and North American firms confirm this pattern ($t = 2.13$; $p < 0.05$).

Regarding financial oriented disclosure, results are essentially similar as those provided in table in 4 panel B. Again, for North American firms, as expected, the coefficient financial oriented disclosure is positive and highly significant (0.071; $p < 0.05$) (H1). For continental European firms, again, results suggest that financial oriented disclosure **do** not convey incremental information to stock market investors since the disclosure variable is not significant (-0.003 $p > 0.10$). Consistent with H3a, t-statistics of coefficient difference between European and North American firms confirm this pattern ($t = 1.48$; $p < 0.10$).

As for intangible capital oriented disclosure, consistent with H1, the coefficient for intangible capital oriented disclosure is positive and significant for firms in both continents (0.115; $p < 0.01$ for North American firms, and 0.048; $p < 0.05$). However, consistent with H3a, t-statistics of coefficient difference between European and North American still show a significant difference between Europe and North America ($t = 1.47$; $p < 0.10$).

[Insert table 6]

Second, 3SLS regressions are estimated for social responsibility disclosure. Results (not tabulated) show that Social responsibility disclosure is only related to forecasts' dispersion for North American firms and quantitative/monetary content (-0.069; $p < 0.01$). The coefficient for the interaction term Social responsibility disclosure*Analyst following is not significant suggesting that analyst coverage does not affect the impact of social responsibility disclosure on forecasts' dispersion.

Third, analysts have an incentive to follow firms with high trading volume, which is correlated with firm size (Alford and Berger, 1999). Regressions are re-estimated introducing trading volume as a determinant of analyst following. Results (not reported) show a significant relationship between volume and analyst following but the coefficient for the variable Market-to-book premium is not significant anymore.

5. DISCUSSION AND CONCLUSION

In this paper, three research questions are addressed in an international context (i.e., Europe vs. North America). (1) Does web-based performance disclosure convey new information to financial analysts? (2) Is the information content of web-based performance disclosure affected by the number of analysts following the firm? (3) How does the institutional governance regime affect financial analyst behaviour with regard to web-based performance disclosure? These questions are addressed using firms from continental Europe (Belgium, the Netherlands, France, Germany) and North America (USA, Canada). In light of endogeneity diagnostics, results are obtained from three simultaneous regressions with forecasts' dispersion, web-based performance disclosure and, analyst following respectively as dependent variables.

Firstly, results show that North American firms provide much more web-based performance disclosure than continental European firms, except for financial disclosure. Regarding the impact of total web-based performance disclosure on analyst forecasts' dispersion, consistent with Hypothesis 1, results show that performance disclosure is associated with a decrease in analyst forecasts' dispersion for North American firms.

Moreover, consistent with Hypothesis 2, performance disclosure is less important in explaining forecasts' dispersion for North American firms when they are followed by many analysts. Consistent with Hypothesis 3a, we provide evidence that performance disclosure has less impact on analyst forecasts' dispersion in continental Europe than in North America. Moreover, consistent with Hypothesis 3b, we document that analyst following has less impact on performance disclosure in Europe than in North America. Finally, we show that performance disclosure is a significant determinant of analyst following in North America but not in continental Europe. This result would suggest that while voluntary disclosure seems to attract analysts in the North America context, in continental Europe, analyst demand for high quality disclosure does not seem to drive voluntary web-disclosure. It is possible that European firms use other communication means to make the same disclosure to their stakeholders. The barrier of language makes it very hard for a European firm and their analysts to reach all stakeholders with a unilingual website. Then, they may use analyst conference calls, press releases, phone conversation, etc. Our results indicate that the quality level of disclosure content in the sense of quantitative/monetary versus qualitative information has a major impact on the information dynamics with regard to financial analysts. Monetary/quantitative disclosure conveys more new information to financial analysts than indicative or qualitative disclosure content. Quantitative information seems to be in greater demand by financial analysts than descriptive and qualitative data. At least, quantitative data will be easier to use in monitoring, benchmarking and ranking firms. Future research needs to address this issue.

The present study contributes to our knowledge of performance reporting in the following manner. First, we adopt a comprehensive and qualitative view of performance reporting as comprising both financial and non-financial information, thus extending prior work that strictly focused on financial disclosure as a tool for earnings forecasting. Second, we expect that insights into the determination of corporate performance disclosure and its interaction with analyst behaviour will help standard setters and regulators in the development of new and effective disclosure guidelines. Third, our results suggest that when assessing information relevance for market participants, it is important to control for the endogenous relationship of a firm's decision to disclose information and its attitude towards financial analysts. Finally, by examining the relevance of different performance disclosure components in a multi-country setting, we enhance our understanding of how a

country governance regime underlies its capital markets' information dynamics. Findings in that regard contribute to the literature on determinants of analyst forecasts' dispersion.

Our results do allow us to highlight some attributes about the information dynamics of both continents' capital markets. Lack of control for such relations could thus lead to erroneous conclusions. The total absence of any of the hypothesized relationships in the simultaneous relationships model for continental Europe, in striking contrast to our results for North American firms, leads us to speculate on how continental European institutional governance characteristics affect the way financial analysts function as information intermediaries. Assuming insufficient analyst efficiency in the production and dissemination of firm-specific information in Europe (Bolliger, 2004), analyst behaviour will not incite management to provide value-relevant information through web-disclosure. Web-based performance disclosure by European firms is not driven by analyst concerns, which makes it as much less inspiring for financial analysts and thus deficient in attracting extra analyst activity. In the same vein, the web-based performance disclosure does not seem to have the quality to improve the properties of analysts' earnings forecasts. Ineffective analyst behaviour would also explain why the amount of analyst activity does not have an effect on its quality in terms of decreasing the dispersion in analyst forecasts. This line of reasoning implies that institutional governance characteristics may have an aggregate and indirect but profound effect on a firm's voluntary disclosure policy through the manner in which firms accommodate their disclosure position to the efficiency of their analysts' mode of searching and processing company-specific information.

A potential limitation of our study is its reliance on Roe's political governance perspective to explain differences in the relationship between corporate disclosure and analyst forecasts between Europe and North America. Other models have been put forward to explain national governance regimes. For instance, Rajan and Zingales (2003) argue that the relative power of beneficial political forces explain a country's financial development and its governance regime. In contrast to Roe (2003), where investors and workers have opposite interests, Rajan and Zingales' view allows for alliances between groups that affect the governance equilibrium. However, the striking difference that we find in our results is more consistent with Roe's view than with Rajan and Zingales' view.

While our evidence pertains to a comprehensive measure of web-based performance disclosure, it does allow us to draw inferences about new financial reporting regulations. With International Financial Reporting Standards now being mandated for all publicly listed firms in the European Union and under consideration in many other countries such as Canada, cross-country differences in financial reporting are slowly being eliminated. Such forceful regulatory action on the financial reporting practices of European firms is likely to attenuate observed differences in the timeliness and relevance of earnings information for stock market participants between Europe and North America (e.g., Ball, Kothari and Robin 2000; Hope, 2003a; Hope, 2003b). However, financial reporting is one but a partial facet of corporate disclosure, with managers being able to convey information about their firm's performance through other means that are financial or non-financial, qualitative or quantitative. In that regard, IFRS adoption is bound to have a destabilizing effect on European firms' performance disclosure strategies, as their governance regime does not otherwise change.

The lack of significant empirical relationships between performance disclosure and analysts' forecasting abilities in continental Europe suggests that corporate governance regimes in continental Europe are but one aspect of a comprehensive social, political and economic equilibrium, which trades off a strong financial shareholder orientation for other stakeholders' benefits. Such trade-offs lead to a loose coupling between performance disclosure and financial market information needs. This loose coupling results in analysts discounting the performance information voluntarily disclosed by firms. However, other institutional mechanisms within a country may be at play. As such, they have a collective effect on how management will perceive the demand for performance disclosure transparency. Although an inquiry into the relevance and specific impact of these finer grained institutional factors on corporate disclosure incentives falls outside the scope of this paper, they certainly deserve more attention in future research. Our results are actually not inconsistent with recent evidence that is reported by Buck and Shahrim (2005) on how corporate governance changes such as incentive compensation translate across national cultures. They show that while US-style governance innovations can be diffused into a country with a different governance regime (Germany), national cultures and institutions may considerably affect their shape, features and effectiveness. Moreover, the adoption of US-style incentive schemes in Germany was not accompanied by the emergence of US-style levels of information disclosure. In other words, exogenous

changes such as executive compensation or stock markets' monitoring through financial analysts may be quickly coopted within a strong national culture and lose their effectiveness or edge.

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Table 1

Web-based performance Disclosure Mean Scores by Country

	Germany	France	Benelux	Continental Europe	Canada	United States	North America	Cont. Europe/ N.America Mean difference p-value	Internal consistency estimate Cronbach alpha
Financial performance	9.86	13.93	9.15	11.11	7.48	12.29	10.79	0.592	0.91
Corporate Governance	10.52	20.10	10.15	13.88	14.38	17.38	16.46	0.000	0.80
Customer Value	7.12	17.38	5.85	10.44	19.52	24.37	22.83	0.000	0.87
Human / Intellectual Capital	7.64	10.48	5.29	7.92	7.22	19.94	15.73	0.000	0.80
Production Efficiency	3.62	7.70	3.52	5.07	8.18	6.66	7.18	0.000	0.79
Innovation / Development and Growth	3.57	9.59	2.09	5.28	5.95	7.75	7.17	0.000	0.80
Social Responsibility	6.55	8.68	5.66	7.04	9.23	20.25	16.55	0.000	0.72
Total score	48.88	88.66	41.72	61.03	73.50	108.20	96.68	0.000	0.75
Sample	84	97	86	267	208	419	627	0.000	0.74

Table 2

Web-based performance disclosure Mean scores by Industry

	Sample	Financial performance	Corporate Governance	Customer Value	Human / Intellectual Capital	Production Efficiency	Innovation / Development and Growth	Social Responsibility	Total score
Consumer goods and services	296	10.40	12.91	15.53	10.58	4.46	4.97	11.80	74.22
Energy	55	8.58	15.13	10.98	11.85	5.91	4.44	17.76	77.60
Chemicals & Drugs	68	8.93	13.18	15.60	18.50	3.54	12.26	15.93	86.69
Industrials	115	7.75	12.46	19.57	13.37	5.42	6.05	11.90	81.49
Information technology	132	15.26	19.27	28.67	17.95	9.89	9.33	11.39	115.95
Materials (resources)	149	10.01	17.20	15.85	9.23	9.59	5.66	14.29	84.64
Telecom & Media	64	8.19	15.42	21.36	9.31	5.13	5.06	7.41	74.42
Utilities	51	13.00	20.94	22.61	21.35	6.57	4.96	25.55	114.42
		18.89	15.69	19.13	13.40	6.55	6.61	13.71	

Table 3
Descriptive statistics
Financial Market, Product Market and
Media Exposure Variables by Country
Means

	Germany	France	Benelux	Canada	United States
Total Assets (million Eur)	22,933	13,989	7,840	6 574	24,225
(median)	(5,522)	(3,891)	(2,425)	(2,285)	(7,526)
Beta	0.49	1.10	0.49	0.59	1.08
Leverage	1.35	1.00	1.02	0.65	1.19
Concentrated ownership	0.48	0.56	0.40	0.28	0.09
Return on Assets	0.06	0.03	0.03	0.01	0.02
Market-to-book	2.67	2.77	3.31	1.81	7.56
Stock exchange	3.07	3,04	1.49	1.66	1.72
Concentration ratio	0.54	0.56	0.55	0.55	0.44
Capital investment intensity	0.36	0.48	0.40	0.45	0.33
Analyst following (number)	12.86	16.21	12.31	5.52	15.93
Analyst forecasts' dispersion	0.46	0.45	0.14	0.16	0.09
Analyst forecasts' dispersion scaled by year average stock price	0.017	0.010	0.004	0.011	0.002
Earnings per share in Eur 2002	1.61	1.53	2.05	0.39	0.57
Absolute change in EPS %	1.40	1.76	5.56	2.17	2.28
(median)	0.38	0.37	0.40	0.68	0.53
Negative EPS (1 or 0) (%)	0.12	0.24	0.27	0.24	0.23
Media exposure- total number	10.14	13.81	1.69	2.63	31.15
Media exposure- Annual average 5 years	10.60	9.67	1.85	4.27	26.28

Table 4
Simultaneous Equations Analysis (3SLS) of the Determinants of Forecasts' Dispersion^Φ

	Sign	Total Web-based performance Disclosure		Financial Oriented Disclosure		Intangible capital oriented disclosure	
		Continental Europe	North America	Continental Europe	North America	Continental Europe	North America
Panel A							
Total content							
Beta	+	***0.246	0.027	***0.270	0.013	***0.270	0.025
Change in Earnings per share	+	-0.001	0.003	-0.001	0.002	-0.001	0.003
Negative Earnings per share	+	**0.180	***0.320	*0.161	***0.325	**0.193	***0.326
Analyst following	-	-0.024	***-0.028	-0.001	***-0.033	**0.028	**0.019
Web-based performance disclosure	-	-0.002	-0.001	-0.007	-0.003	-0.009	*-0.006
Web-based performance disclosure* Analyst following	+	0.001	0.001	0.001	0.001	0.001	0.001
R-square		12.28%	6.11%	9.91%	4.62%	13.13%	7.30%
Durbin-Watson		1.79	1.78	1.83	1.79	1.77	1.80
N		209	471	209	471	209	471
Panel B							
Quantitative/ Monetary content							
Beta	+	***0.263	0.031	***0.262	0.014	***0.271	*0.057
Change in Earnings per share	+	-0.001	0.003	-0.001	0.003	-0.001	0.003
Negative Earnings per share	+	**0.167	***0.317	**0.163	***0.328	**0.167	***0.312
Analyst following	-	-0.006	***-0.024	0.005	***-0.029	*-0.020	***-0.023
Web-based performance disclosure	+	0.005	***-0.014 ¹	0.022	***-0.023 ²	-0.014	***-0.040 ³
Web-based performance disclosure* Analyst following	+	-0.001	***0.001	-0.001	***0.001	0.001	***0.002
R-square		10.3%	5.45%	8.28%	5.67%	12.56%	3.00%
Durbin-Watson		1.82	1.89	1.87	1.88	1.80	1.89
N		209	471	209	471	209	471

*: p < 0.10; **: p < 0.05; ***: p < 0.01. One-tailed if there is a predicted sign, two-tailed otherwise.

^Φ Regression on the determinants of web-based performance disclosure, and regression on the determinants of analyst following are presented in table 5.

1 t-coefficient difference p-value significant at 0.091

2 t-coefficient difference p-value significant at 0.078

3 t-coefficient difference p-value significant at 0.171

Table 5
Simultaneous Equations Analysis of the Determinants of
Total Web-based performance Disclosure and Analyst Following
Europe versus North America

	Sign	Continental Europe		North America	
		Disclosure	Analyst following	Disclosure	Analyst following
Analyst following	+	-0.053		***1.723 ^ϕ	
Stock exchange listings	+	-1.903	***1.126	***6.387	-0.760
Capital investment intensity	+/-	4.751		2.783	
Concentration ratio	+/-	*-15.624		***-39.603	
Concentrated ownership	-	0.633	*-1.519	-7.248	-1.117
Leverage	-	*-0.534	0.058	-0.440	*-0.171
Return on Assets	+	6.020		3.498	
Firm Size	+	***5.252	***1.835	***3.191	***1.270
Market-to-book ratio	+	*2.000	***1.032	-0.052	**0.082
Beta	+		***3.426		**0.992
Web-based performance disclosure	+		0.032		***0.093
Media Exposure	+	***0.376		***0.118	
R-square		46.10%	55.86%	21.03%	27.53%
Durbin-Watson		1.80	2.02	1.90	2.00
N		209	209	471	471

*: p < 0.10; **: p < 0.05; ***: p < 0.01. One-tailed if there is a predicted sign, two-tailed otherwise.

Coefficients for industry-specific and country-specific dummies not presented.

^ϕ t-coefficient difference significant at 0.019

Table 6
Simultaneous Equations (3SLS) Analysis of the Determinants of Market-to-book Premium^Φ
Europe versus North America
Quantitative/ Monetary content

	Sign	Total Web-based performance Disclosure		Financial Oriented Disclosure		Intangible capital oriented disclosure	
		Continental Europe	North America	Continental Europe	North America	Continental Europe	North America
1/Equity	+	***145.4	***481.1	***141.1	***437.9	***154.8	***479.0
Earnings/Equity	+	0.009	***1.062	0.006	***1.288	0.010	***1.063
Negative Earnings (1/0)	-	***-0.893	-0.345	***-0.891	-0.209	***-0.895	-0.586
Negative Earnings	+	***-0.893	-0.345	***0.892	-0.203	***-0.895	-0.586
Web-based performance disclosure	-	0.013	***0.063 ¹	-0.003	**0.071 ²	**0.048	***0.115 ³
R-square		11.42%	14.06%	8.75%	15.75%	12.30%	12.47%
Durbin-Watson		2.01	1.96	1.99	1.92	2.01	1.95
N		209	471	209	471	209	471

*: p < 0.10; **: p < 0.05; ***: p < 0.01. One-tailed if there is a predicted sign, two-tailed otherwise.

^Φ Regression on the determinants of web-based performance disclosure, and regression on the determinants of analyst following are not presented.

1 t-coefficient difference p-value significant at 0.017

2 t-coefficient difference p-value significant at 0.069

3 t-coefficient difference p-value significant at 0.071

Appendix
performance disclosure grid

Coding scores

Liquidity	Product description
Indebtedness	Quality / up-to-date technology
Interest coverage	Reliability: errors / returns
Total solvency	Price
Net operating income	Delivery time
Gross margin	Awards
REA or REO	Total product
EPS (diluted)	Customer profile / market segment / market share / number of customers
Stock price or stock return	Pre-sales support: • information / counsel / orders follow-up
EVA	After-sales service / insurance
Total profitability	Customer satisfaction / complaints management
Total financial performance	Customer loyalty
Leadership	Awards
Mission	Total Customers
Strategic planning	Service Internet (1 of order, 2 if service, 3 if both)
Risk management	E-business sales
Globalization	E-business productivity [Cost efficiency / speed]
Total strategic management	Impact (award, number of users or visitors)
Competence of managers	Total e-business
Managers' compensation	Total customer value
Total managers	Hiring / new employees
Competence Board	Qualification / expertise
Independence Board	Training
Compensation (stocks/options)	Description of job requirements 1, 2, 3
Other committees	Total competence
Total directors	Employee empowerment / involvement
Competence Audit committee	Capacity to suggest and to implement changes
Independence Audit committee	Teamwork
Relations with external auditors	Performance assessment
Relations with internal auditors	Performance based compensation
Total Audit committees	Earnings-based compensation
Ownership structure	Carrier opportunities
Other	Award
Total ownership	Fringe benefits
Total corporate governance	Total motivation/work climate
	Employees satisfaction, survey
	Employee turnover
	Other
	Total satisfaction
	Total human/intellectual capital

Investment (\$)
Reengineering / downsizing
Process improvement methods (ex. Kaizen)
ISO 9000, total quality management – TQM
Others (benchmarking, JIT, etc.)

Total operations rationalization

Production cost
Production capacity
Waste
Inventory / run out rate
Quality of equipment and technology
Flexibility
Process description (1,2,3)
Others

Total productivity-cost

Production time
Unplanned downtime

Total productivity-speed / cycle time

Partnerships
Acquisitions

Total strategic alliances

Total production efficiency

Sales – new products
Market share – new products
Awards

Total new products

Investments in R&D
Description of products in development
Product testing
Awards
Others - R&D

Total R&D

Increase in sales / market shares
Increase in investments

Total growth

Total innovation, development et growth

Purchases of goods and services
Employment opportunities
Job creation]
Equity programs
Human capital development
Regional development
Gifts and sponsorships
Accidents at work
Health and safety programs
Product-related-incidents
Products in development and environment
Product safety
Business ethics
Strategic alliances
Community involvement
Social activities
Total social responsibility
Total performance management