Chaire d'information financière et organisationnelle

**Financial Reporting Transparency and Earnings Quality:
A Governance Perspective**

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May 2009

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Abstract:

This study investigates the following research questions. How transparency in firms' financial reporting strategy reduces information asymmetry on stock market? How web-based financial reporting affects, and is affected by earning quality? How governance attributes influence web-based financial reporting, earnings quality, and information asymmetry? Our results suggest that managers' decision to report earnings of good quality is not isolated from the overall financial reporting strategy. In fact, it appears that financial markets react positively to both earnings quality and web-based financial reporting. Moreover, the board of directors appears to be an important actor in that strategy.

Key words: Web-based financial reporting, earnings management, corporate governance, information asymmetry.

La qualité du reporting financier et des résultats comptables publiés :
Une perspective de gouvernance

Résumé :

Dans la présente étude, nous analysons les effets simultanés de la divulgation sur le web au sujet de performance financière, de la qualité des résultats comptables et de l'asymétrie informationnelle dans les marchés boursiers. Une plus grande transparence en matière de performance financière devrait se traduire par une meilleure qualité des résultats comptables et vice versa et cela devrait mener à une réduction de l'asymétrie informationnelle. Nos résultats montrent que : (1) la divulgation sur le web au sujet de la performance financière et la qualité des résultats comptables réduisent l'asymétrie informationnelle sur les marches boursiers ; (2) la divulgation sur le web au sujet de la performance financière réduit l'ampleur de la gestion des résultats comptables ; (3) un conseil d'administration indépendant semble générer plus de transparence dans la communication financière sur le web alors que la taille du conseil et du comité d'audit sont positivement associées à la qualité des résultats comptables publiés. Enfin, il ressort de nos résultats que les investisseurs boursiers accordent plus de crédibilité à la publication de résultats de moins bonne qualité pour les firmes qui sont plus transparentes dans leur divulgation financière sur le web.

Mots clés : asymétrie informationnelle, divulgation financière sur le web, gestion des résultats, gouvernance.

INTRODUCTION

The advent of the Internet has considerably transformed corporate disclosure strategies by providing much more flexibility compared with traditional means regarding the presentation and content of financial and non-financial reporting. The web makes interactions between managers and investors more direct, dynamic and interactive. Hence, we can expect firms to use the web to structure their disclosure of information about various aspects of their activities in a way that is conditioned by how it will ultimately benefit shareholders.

In this paper, we investigate the following research questions: (1) How transparency in firms' financial reporting strategy reduces information asymmetry on stock market? (2) How web-based financial reporting affects, and is affected by, earning quality? (3) How governance attributes influence web-based financial reporting, earnings quality, and information asymmetry?

Our investigation is guided by information economics theory suggesting that the decision by a firm's management to enhance earnings quality and financial reporting transparency 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.

The study focuses on voluntary financial reporting comprising only information that is available on Canadian firms' web sites and provided in an HTML format. In Canada, mandated disclosure is filed on a system of electronic data archiving and retrieval, so-called SEDAR, and maintained by securities regulators. SEDAR operates a web site (www.sedar.com) that comprises all documents for which disclosure is mandated by securities regulators: financial statements, annual reports, proxy statements, MD&A and press releases (which typically concern material changes). However, all these documents are also available in paper format. The content

of all these documents is regulated. Therefore, our financial reporting measure reflects a voluntary decision by firms either to repeat mandated information already available on the web (SEDAR or PDF documents), but in a different format (HTML), or to release new information that is not available elsewhere. While securities regulators have oversight responsibilities over all of a firm's disclosure activities, their oversight is bound to be less tight for disclosures when there is no specified form or content to rely upon, which is the case for web financial reporting outside of SEDAR.

Our study innovates by investigating the relationship between web-based financial reporting and earnings quality and their impact on information asymmetry taking into account a firm's governance attributes. Our results suggest that managers' decision to report earnings of good quality is not isolated from the overall financial reporting strategy. In fact, it appears that financial markets react positively to both earnings quality and web-based financial reporting. Moreover, the board of directors appears to be an important actor in that strategy.

More specifically, our main findings are the following. First, both web-based financial reporting and earning quality reduce information symmetry. Second, web-based financial reporting affects and is affected by earnings quality. Third, an independent board of directors translates into more transparency in web-based financial reporting while board size and audit committee size are associated with better earnings quality and with less information asymmetry. Finally, our results suggest that market participants give more credibility to lower quality earnings for firms that are more transparent in their financial reporting.

The remainder of the paper is organized as follows. Section 2 presents the theoretical background and develops hypotheses. The study's method is described in section 3. Results are

presented in section 4. Finally, section 5 provides a discussion of the potential implication of the results.

BACKGROUND AND HYPOTHESES

Financial reporting quality and information asymmetry

Information asymmetry between managers and investors, resulting from agency relationship, or between informed and uninformed investors, creates demand for more transparency in financial reporting either mandated or voluntary. According to economic theory, reducing information asymmetry on the stock market increases share liquidity and reduce equity cost of capital (Diamond and Verrecchia, 1991). A firm may decide to reduce information asymmetry, by providing earnings of better quality and/or by voluntary releasing information, if it less costly than having investors and other market participants incur information costs themselves (Milgrom, 1981; Atiase, 1985; Roberts, 1992; Lang and Lundholm, 1993). However, a firm may prefer to refrain from disclosing some aspects of its activities if it provides outside parties with information that could be used to the firm's detriment, i.e. when proprietary costs resulting from voluntary disclosure are high (Scott, 1994).

Prior research documents that disclosure transparency, financial or non-financial, reduces information asymmetry in the stock market. Concerning voluntary financial disclosure, we can mention Beaver, Eger, Ryan and Wolfson (1989) who show, for the banking sector, that voluntary disclosure concerning characteristics of the loan portfolio has incremental explanatory power beyond that provided by allowance for loan losses accounted for in financial statements.

In addition, Scott (1994) demonstrates the proprietary cost implications and valuation relevance of voluntary pension disclosures.

Many studies refer to Association for Investment Management and Research (AIMR) disclosure scores to measure financial disclosure quality (e.g. Botosan, 1997; Healy, Hutton and Palepu, 1999; Botosan and Plumlee, 2002). These studies conclude that greater disclosure reduces the cost of capital.

There is also studies focusing on non-financial disclosure in general (e.g. Aerts, Cormier and Magnan, 2007), or on more specific disclosure such as customer satisfaction (e.g. Ittner and Larcker, 1998; Banker, Potter and Srinivasan, 2000), corporate governance attributes and disclosure (e.g. Niu, 2006, Cormier, Ledoux, Magnan and Aerts, 2009) or social and environmental disclosure (e.g., Richardson and Welker, 2001; Aerts, Cormier and Magnan, 2008).

With respect to web-based disclosure, based on an Australian sample, Chang, D'Anna, Watson and Wee (2008) examine the association between web-based corporate disclosure quality and information asymmetry using a checklist to evaluate a firm's web-based investor-relations practices. Firms with higher disclosure quality through their investor-relations activities have higher analyst following, attract more institutional investors, have more active trading, and are larger in terms of market capitalization. Moreover, bid-ask spread decreased with increased in disclosure quality.

In an international comparative study (continental Europe versus North America), Aerts, Cormier and Magnan (2007) show that web-based corporate disclosure affects analyst forecast dispersion but is substantiated for intangible capital disclosures and quantitative-monetary disclosure content in North America. For continental European firms, no significant relationships

emerge between performance disclosure, analyst following and analyst forecast dispersion. Overall, their findings show that in continental Europe, web-based performance disclosure is less affected by financial market concerns than in North America, a result consistent with a less unilaterally focused stakeholder model of corporate governance.

Finally, in the Canadian context, Cormier, Ledoux and Magnan (2009b) investigate the simultaneous interactions between web-based corporate governance disclosure, earnings quality and share price volatility. Their results show that governance disclosure reduces stock market asymmetry as measured by share price volatility. They also document a positive association between governance disclosure and Tobin's Q suggesting that voluntary disclosure about governance processes can be value relevant.

Prior research also shows a relationship between earnings quality and information asymmetry on the market place. We observe that in markets with high liquidity and sophisticated investors (e.g., the U.S. markets), accruals are more value relevant than cash flow from operations (e.g. Wilson, 1986 ; Sloan, 1996) or complement cash flow in helping investors to assess a firm's performance (Bowen, Burgstahler et Daley, 1987; Cormier et Martinez, 2006). Moreover, normal accruals appear to be more valued than abnormal accruals (Dechow, 1994; Subramanyam, 1996).

In the Swiss context, a less liquid market, Cormier, Magnan and Morard (2000) find that all three components of reported earnings, i.e. cash flow from operations, normal accruals and abnormal accruals, are positively related to firm value and that the coefficients from all three components of earnings are quite similar.

The fact that abnormal accruals could be value relevant is consistent with two alternative scenarios. Either abnormal accruals improve the ability of earnings to reflect economic value, or

they are priced by an inefficient market (Subramanyam, 1996). Under the first scenario, managers improve the value relevance of earnings by managing earnings and then communicating private information about the future profitability of the firm. In the second scenario, discretionary accruals are seen as an opportunistic distortion of earnings. In that case, value relevance of discretionary accruals provides evidence that the stock market is functionally fixated on earnings. Consistent with this scenario, Teoh and Rao (1998) and Balsam, Bartov and Marquardt (2002) find a negative relationship between abnormal accruals and post-issue stock returns, suggesting that investors naively fix on pre-issue earnings without correcting for abnormal accruals.

Abnormal accruals either improve the ability of earnings to reflect economic value or are seen as an opportunistic distortion of earnings and are value irrelevant but priced by an inefficient market or unpriced in an efficient market. However, in an efficient and sophisticated stock market, we expect earnings of lower quality, as measured by abnormal accruals in absolute value, to increase uncertainty in the stock market, thus information asymmetry. This is consistent with a recent study from Bhattacharya, Desai and Venkataraman (2009) who document, for a US sample, that poor earnings quality is significantly and incrementally associated with higher information asymmetry.

Hence, we posit that more transparency in financial reporting, i.e. providing earnings of quality and voluntary releasing financial information on the web, reduces information asymmetry on the stock market. Therefore, we propose the two following hypotheses:

> *H1: Web-based financial reporting reduces information asymmetry in the stock market.*
> *H2: Earnings quality reduces information asymmetry in the stock market.*

Voluntary financial reporting and earnings quality

Corporate disclosure and earnings quality are both subject to managers' discretion. In that sense, managers are likely to consider their interaction it their reporting strategies. Lobo and Zhou (2001) hypothesize that the extent of earnings management negatively related to corporate disclosure quality. They measure disclosure quality using the Association for Investment Management and Research's rankings (AIMR) of corporate disclosure and earnings management using discretionary accruals. Their findings, based on a U.S. sample, provide evidence of management's use of the flexibility afforded under current minimum disclosure requirements to exercise discretion in reporting earnings.

In addition, Francis, Nanda and Olsson (2008) investigate the relations among voluntary disclosure, earnings quality, and cost of capital. Their findings show that firms with good earnings quality have more expansive voluntary disclosures than firms with poor earnings quality. They also find that more voluntary disclosure is associated with a lower cost of capital.

With respect to web-based disclosure, Ashbaugh, Johnstone and Warfield (1999) suggest that firms that place a premium on high-quality external reporting perceive the Internet to be an effective communication medium to complement their traditional reporting practices. Moreover, Cormier, Ledoux and Magnan (2009a) show that firms take into account variables proxying for information costs and benefits accruing to stockholders when determining the extent of their web disclosure about corporate performance. Consistent with the assertion that web-based disclosures convey relevant information to stock market participants in their assessment of earnings quality, their findings also show that a firm's web-based performance disclosure affects its earnings

valuation multiple, although in a differential manner according to the nature of the information being conveyed.

Niu (2006) examines the association between disclosure quality about governance for a Canadian sample. The author does not find a relationship between governance disclosure and abnormal accruals. This result might be due to the fact that the author does not take into account the simultaneous effect of governance attributes, governance disclosure and information asymmetry. Cormier, Ledoux and Magnan (2009b) investigate the simultaneous interactions between web-based corporate governance disclosure, earnings quality and share price volatility. Contrary to Niu's findings, their results, also based on a Canadian sample, show that corporate governance disclosure is associated with better quality earnings, as measured by abnormal accruals in absolute value.

Hence, we posit that web-based financial reporting will positively affect and by affected by the earnings reported in the annual, which lead to the following hypotheses:

H3: Web-based financial reporting affects and is affected by earnings quality.

Web-based financial reporting and earnings quality: the role of governance

Prior studies show that corporate governance influences the quality of corporate disclosure (Eng and Mak, 2003). The intensity of monitoring by a board influences managerial discretion and requires firms to show more transparency in organizational performance measurement and reporting (Fama, 1980).

The board can play its monitoring role through various attributes. An independent board is more likely to be effective in assessing managerial decisions and performance than a board that comprises only insiders (Fama and Jensen, 1983; Beasley, 1996; Xie, Davidson and DaDalt, 2003). Chen and Jaggi (2000) document that a board comprising mostly independent non-executive directors is associated with transparency in financial disclosure. Karamanou and Vafeas (2005) also show that firms with better governance are more likely to issue voluntary earnings forecasts. Furthermore, Holder-Webb et al. (2009) find that firms with less independent boards disclose less information about board independence and management oversight matters.

Prior studies document that the presence of an independent and competent board of directors should limit managers' ability to manage earnings (Klein, 2002; Peasnell, Pope and Young, 2003). Board independence gives directors the ability to challenge managers' decisions when they consider that the financial statements do not reflect faithfully the economic reality of the firm. Peasnell, Pope and Young (2003) document a significant negative association between income-increasing accruals and the proportion of outside board members. Klein (2002) shows the same negative relationship between board independence, audit committee independence and discretionary accruals. Hence, reductions in board or audit committee independence are accompanied by large increases in discretionary accruals. The most pronounced effects occur when either the board or the audit committee is composed of a minority of outside directors.

More recently, Chang and Sun (2009) argue that the passage of Sarbanes-Oxley Act (SOX) marks the beginning of cross-listed foreign firms' mandatory disclosure of audit committee composition and other corporate governance information. They posit that SOX improves the effectiveness of an independent audit committee and other corporate governance functions in monitoring the earnings quality of cross-listed foreign firms. They measure the

earnings quality by the sample firms' earnings informativeness (i.e. earnings response

coefficient) and earnings management. Their findings show significant positive associations

between earnings informativeness and audit committee independence as well as board

independence in the post-SOX period. In contrast to the post-SOX results, they do not find a

significant association between earnings informativeness and audit committee independence in

the pre-SOX period. They also find a consistently negative association between earnings

management and audit committee independence after SOX, while such association is not found

in the pre-SOX period. Similarly, a negative association between earnings informativeness and

CEO duality is only found in the post-SOX period. Furthermore, their results show a positive

(negative) association between earnings informativeness (earnings management) and an

aggregate corporate governance score, which is a measure of overall corporate governance

functions, in both the pre- and post-SOX periods.

In the Canadian context, Niu (2006) examines the association between corporate

governance mechanisms and the quality of accounting earnings. Using firm-level corporate

governance data for the 2001-2004 sample, the author explores the relationship between

corporate governance (including board composition, management shareholding, shareholders'

rights and the extent of disclosure of governance practices), and the quality of earnings. Results

show that overall governance quality is negatively related to the level of abnormal accruals and

positively influences the return-earnings association. In addition, the magnitude of abnormal

accruals is negatively associated with board independence, the extent of alignment of

management compensation with interests of shareholders and the strength of shareholder rights.

Finally, from a simultaneous equations model, Cormier, Ledoux and Magnan (2009b), for a Canadian sample, show that board size and audit committee size are associated with more extensive governance disclosure and better quality earnings as measured by abnormal accruals.

These findings suggest that board independence can be effective in monitoring the corporate financial accounting process. Hence, we posit that corporate governance will increase transparency in web-based financial disclosure and enhance the quality of earnings reported.

Therefore, we propose the two following hypotheses:

H4: Efficient corporate governance mechanisms increase web-based financial reporting.

H5: Efficient corporate governance mechanisms enhance earnings quality.

METHOD

Sample

Our study focuses on disclosure data from 136 Canadian firms. For each firm, we coded their web-based financial reporting in the spring of 2005. We initially collected web disclosures in the summer of 2002 for an international study (XXX, 2007). All non-financial firms represented on the Toronto Stock Exchange S&P/TSX Index were identified (the total index comprises 220 firms in the summer of 2002). The resulting 2002 sample comprised 189 non-financial firms. Mergers and acquisitions, bankruptcies and delistings reduced our sample to 155 in 2005. Out of the initial sample of 155 firms, there are missing data for board size, board independence, and share price volatility, for a remaining sample of 136 firms. These firms

represent 44% of the total market capitalization of the Toronto Stock Exchange (TSE) and 80% of non-financial firms listed on the TSE.

Financial reporting indicators (e.g. efficiency indicators such as gross margin, return of assets, return on equity, economic value added, etc.) are based on performance measurement practices (e.g. Standard & Poors, 2002; Pirchegger and Wagenhofer, 1999; Marston and Polei, 2004). The same coding approach has been used by Aerts, Cormier and Magnan (2007) and Cormier, Ledoux and Magnan (2009).

We use a coding scale to qualify a firm's performance disclosure. We give one point for an indicative information, two points for a qualitative information and three points for a quantitative information. This approach allows for an integration of different types of information into a single figure that is comparable across firms in terms of relevance. To ensure consistency among firms, two persons reviewed all individual scores independently. All disagreements were subsequently reviewed by one of the co-researchers.[1] Our emphasis on information quality and the removal of redundancies, repetitions and uninformative statements is consistent with prior work in financial/non-financial disclosures (e.g. Lang and Lunholm, 1993; AIMR, 2002; Botosan, 1997; Healy, Hutton and Palepu, 1999).

To validate the representativeness of our coding grid, we contrasted the winners of the Corporate Reporting Awards competition (an annual event organized by the Canadian Institute

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[1] A coding manual documenting coding instructions as well as standardized coding worksheets were prepared before hand. Each coder then applied the following coding sequence: (1) independent identification of the occurrence of items relative to the different coding categories; (2) independent coding of the items according to quality level of content and (3) timed reconciliation on a subset of company reports. The coders were intensively trained in applying coding instructions and in using the coding worksheets. They were unaware of the research hypotheses. Initial differences in identifying grid items accounted for on average 7% of the maximum number of items identified. Of the information quality level coding, less than 10% had to be discussed for reconciliation. Disagreement between coders mostly happened at the beginning of the coding process (essentially the first 30 sample firms). A researcher reconciled coding disagreements exceeding 5% of the highest total score between the two coders. Smaller disagreements were resolved by the two coders themselves.

of Chartered Accountants) with our coding scores. Winning firms had an average financial reporting score that was close to twice the magnitude of our remaining sample firms.

Financial data was collected from the 2004 Stock Guide and data about governance attributes was collected from 2004 proxy statements. Data used for earnings, governance attributes and web-based financial reporting was available in the spring of 2005. Sample firms operate in the following industries: Metals and mines; Gold and precious metals; Oil and gas; Paper and forest products; Consumer products; Industrial products; Real estate; Utilities; Communication and media; Merchandising.

Empirical model

This study attempts to provide an integrated analysis of firms' web-based financial reporting transparency, earnings quality and information asymmetry. It is thus important to control for the presence of endogeneity between our critical variables.

Many proxies have been used to assess information asymmetry, such as the cost of capital, share price volatility, analyst forecast dispersion, bid-ask spread, and Tobin's Q. In the current study, we use share price volatility as our first proxy for information asymmetry (as a sensitivity analysis, we also use Tobin's Q). The following structural equations summarize the approach adopted in the empirical analysis:

(1.1) Financial reporting $_{it}$ =

$f(\flat_0 + \flat_1$ Abnormal accruals $+ \flat_2$ Analyst following $+ \flat_3$ Board independence $+ \flat_4$ Board size $+ \flat_5$ Board size squared $+ \flat_6$ Audit committee size $+ \flat_7$ Firm size $\flat_{8\text{-}17}$ Industry$)_{it}$

(1.2)   Abnormal accruals $_{it} =$

$f(b_0 + b_1$ Analyst following $+ b_2$ Board independence $+ b_3$ Board size $+ b_4$ Board size squared $+ b_4$ Audit committee size $+ b_5$ Financial reporting$)_{it}$

(1.3) Share price volatility $_{it} =$

$f(b_0 + b_1$ Systematic risk $+ b_2$ Free float $+ b_3$ Analyst following $+ b_4$ Board independence $+ b_5$ Board size $+ b_6$ Board size squared $+ b_7$ Audit committee size $+ b_8$ Abnormal accruals b_9 Financial reporting$)_{it}$

Governance attributes

Common to the three simultaneous equations, governance variables are introduced to capture the impact of corporate governance as a monitoring factor affecting web-based financial reporting, earnings quality and share price volatility. These variables are: *Board independence*; *Board size*; and *Audit committee size*. We expect a positive relationship between board effectiveness and web-based financial reporting and a negative relationship with abnormal accruals and share price volatility.

Board independence. In addition to the independence of board members, Rechner and Dalton (1991) show that an independent leadership structure, in which two different persons are posted as Chair and CEO, monitors the top management effectively. Hence, our variable takes the value of zero (0) when the majority of directors are not independent, one (1) when the majority of directors are independent and two (2) when the majority of directors are independent, and the functions of CEO and Chair of the Board are separate.

Board size. Bédard, Chtourou and Courteau (2004) find that board size is associated with less earnings management but only for income decreasing accruals while Cormier, Ledoux and Magnan (2009b) document a negative association between board size and abnormal accruals in absolute value. Their findings also show that board size is positively related to governance disclosure and negatively related to share price volatility. Moreover, some prior studies (e.g. Golden and Zajac, 2001; Vafeas, 1999) assume the relationship between board size and performance to be an inverted "U" shape, with an optimal board size existing midway. Below this optimal, or most efficient board size, there is a positive relationship between board size and information asymmetry followed by a negative relationship. Yermack (1996) and Eisenberg et al. (1998) find that there is an inverse relationship between board size and Tobin's Q. Yermack (1996) attributes this to the lack of coordination and communication associated with a large board. This slows the decision-making process and causes the board to be less efficient. To account for the possible non-linear relationship between board size and information asymmetry, we include two variables in our models: Board size and Board size squared.

Audit committee size. We put forward the view that audit committee effectiveness is a critical determinant of web-based financial reporting. In Canada, audit committees must comprise at least three independent members. We can argue that three is a small number for the audit committee to effectively play its monitoring role and, in that regard, adding a few more members could enhance this monitoring role. Cormier, Magnan and Ledoux (2009b) show that audit committee size negatively relates to abnormal accruals and to share price volatility. However, they do not find any association with governance disclosures. We can expect a larger association between audit committee size and financial reporting transparency than with

governance disclosure, as transparency in financial reporting is central for the audit committee mandate.

Determinants of web-based financial reporting

Four variables are introduced as determinants of web-based financial reporting: *Abnormal accruals, Analyst following, Firm size*, and *Industry*.

Abnormal accruals. We posit that firms using abnormal accruals intensively will be less transparent in voluntary financial reporting. Therefore, we anticipate a negative relationship between web-based financial reporting and abnormal accruals.

Analyst following. Prior studies (Imhoff and Lobo, 1992; Atiase and Bamber, 1994; Marquardt and Wiedman, 1998) argue that analyst following functions as a proxy for a firm's information that is publicly available. Moreover, Lang and Lundholm (1996) and Healy, Hutton and Palepu (1999) find a positive relationship between analyst following and the quality of a firm's disclosure. Hence, transparency in web-based financial reporting is likely to attract financial analysts (Khanna, Palepu and Srinivasan, 2004).

Firm Size. Prior evidence is consistent in showing a positive relationship between the extent of corporate disclosure and firm size (Scott, 1994; Neu, Warsame and Pedwell, 1998; Eng and Mak, 2003; Aerts, Cormier and Magnan, 2007). Firm size, measured as ln(Assets), is introduced with an expectation of a positive relationship with web-based financial reporting.

Industry. Corporate voluntary disclosure is likely to differ depending on the industry in which the firm operates. Hence, competition, analyst following and demand for disclosure varies

among industries (Wagenhofer, 1990). Therefore, dummy variables are used to control for industry effects.

Determinants of earnings quality

In assessing earnings quality, we refer to the notion of abnormal accruals. The accruals variable is measured as the difference between net earnings and cash flow from operations.[2] Collins and Hribar (2002) argue that the difference between net income and cash flow from operations is the correct measure of total accruals and that the use of a balance sheet approach may lead to a systematic bias in the discretionary accruals estimation.

While a firm's total accruals are easily accessible from its financial statements, normal and abnormal accruals must be inferred through an estimation model since they are not directly observable. Normal accruals reflect a firm's economic environment or its underlying level of activity independent of managerial intent to alter earnings figures. For a given firm (i), current period (t) normal accruals is modeled in the following manner:

(1) $\text{Accruals}_{it} = \alpha_1 \text{Change in Sales}_{it} + \alpha_2 \text{Cash Flow}_{it-1} + \alpha_3 \text{PPE}_{it} +$
          $\alpha_4 \text{Negative Earnings (1/0)} + \varepsilon_{it}$

Equation 1 implies that a firm's total accruals (Accruals) are more or less determined in a systematic manner by its performance (Change in sales), lagged cash flow from operations (Cash Flow) and the level of its property, plant and equipment (PPE). Prior empirical evidence is

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2 Corporate executives can engage into earnings management essentially by altering or revising estimates employed in the computation of accruals. While a firm's earnings also depend on its level of cash flow from operations, it is less likely that executives will manipulate cash flow. For example, it is not evident how clients can be forced to pay unpaid balances sooner, and postponing payments to employees and suppliers is bound to create numerous problems.

consistent with such propositions. First, variation in sales is a proxy for a firm's performance.

Second, lagged cash flow from operations (i.e., cash from last period) is assumed to

systematically determine current period normal accruals since changes in cash flow and in

accruals are correlated over time (Dechow, 1994). Third, the level of property, plant and

equipment serves to control for other normal components such as the portion of depreciation

expenses (Jones, 1991).

The model is estimated by a cross sectional regression for the 2001 to 2003 period (155

firms X 3 years = 465 firm-year observations).[3] Since 28% of sample firms incurred negative

earnings during the estimation period (2001 to 2004), we add a dummy variable net loss (1/0) to

control for this.

The normal accruals model is the following (R-square: 18.2%; F-statistic: 6.852):

(2) $Accruals_{it} = 0.026 + 0.063$ Change in $Sales_{it}$ $- 0.288$ Cash Flow from operations$_{it-1}$
              (0.156) (0.052)   (0.017)
              $- 0.160$ PPE_{it} $- 0.092$ Negative Earnings$_{it}$
               (0.004)   (0.001)

The coefficients from the above regression (variable scaled by total assets except the

dummy variable for net loss) are then used to compute fitted values (also called normal accruals)

in the following way:

(3)   Normal $Accruals_{it} = \alpha_0 + \alpha_1$ Change in $Sales_{it} + \alpha_2$ Lagged Cash $Flow_{it-1} +$
                        α_3 $PPE_{it} + \alpha_4$ Negative Earnings$_{it}$

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3 Results remain almost similar when we estimate normal accruals on the 2001 to 2004 period.

The resulting estimated accruals measure is then subtracted from sample firms' actual total accruals to obtain an estimate of abnormal accruals. Since more transparency in web-based financial reporting is likely to lead to better quality earnings, we introduce abnormal accruals in absolute value to capture earnings quality.

Analyst following. The monitoring role played by financial analysts is likely to improve earnings quality. DeGeorge, Ding, JeanJean and Stolowy (2005) show that this monitoring role is more efficient in high enforcement countries like Canada. However, the authors observe that in such countries, earnings management occurs in the short term, mainly to achieve analysts' forecasts. Since the actual impact of analyst following on earnings quality is unclear, no directional predictions are made.

Determinants of share price volatility

Prior studies on the determinants of the information asymmetry component of cost of capital suggest numerous determinants other than voluntary disclosure (Leuz and Verrecchia, 2000). Based on that literature, we use *Analyst following*, *Systematic risk*, and *Free float*, *Financial reporting,* and *Abnormal accruals* as determinants of share price volatility.

Analyst following. Roulstone (2003) documents findings consistent with analysts reducing information asymmetry by providing public information to market participants, while there is no support for analyst following functioning as a proxy for privately held information. If analyst information disseminates quickly to large numbers of market participants, then high analyst following represents a "good" information environment for uninformed and partially informed market participants. Hence, a firm's analyst following is used as a proxy for the level

of non- disclosures and the extent of a firm' communication with financial analysts (Leuz, 2003).

We expect a negative relationship between analyst following and share price volatility.

Systematic risk. The higher a firm's systematic risk, the more difficult it is for investors to precisely assess a firm's value and the more likely they are expected to incur information costs to assess its risk drivers. Prior research shows that investors charge a higher cost of equity for firms with higher systematic risk (e.g. Botosan, 1997; Leuz and Verrecchia, 2000; Gebhardt, Lee and Swaminathan, 2001; Mikhail, Walther and Willis, 2004; Botosan and Plumlee, 2005; Hail and Leuz, 2006). A positive relationship is expected between systematic risk and share price volatility.

Free float. We use free float as an inverse proxy for the presence of insiders since control blocks have generally greater access to private information (Leuz and Verrecchia, 2000). Hence, we expect a negative association between free float and share price volatility.

Financial reporting and *Abnormal accruals.* We posit that web-based financial reporting may enhance the credibility of reported earnings in the annual report. Therefore, we anticipate web-based financial reporting to reduce share price volatility and abnormal accruals to increase share price volatility.

Variable measurement

Variable	Measure
Share price volatility	Standard deviation of percentage changes in daily stock prices
Tobin's Q	Market value of a firm's equity, plus the book value of its debt, divided by the book value of equity and debt
Systematic risk	Beta
Analyst following	Number of analysts following a firm.
Board independence	(0) if a majority of directors are not independent; (1) if a majority of directors are independent; (2) if a majority of directors are independent and if the functions of CEO and Chair of the Board are separated.
Board size	Number of directors on the board.
Audit committee size	Number of audit committee members.
Firm size	Ln(Total Assets) as of year-end

RESULTS

Descriptive statistics

Table 1 provides some descriptive statistics about sample firms' financial and governance variables. Sample firms are relatively large (total assets averaging $5 billion). About 78% of sample firms are free float. Firms are on average followed by seven financial analysts. Our sample firms have independent directors in a proportion of 36% and CEO and board chair duality of 20%. Total accruals are on average -5.9% of total assets and abnormal accruals present an earnings-increasing mean of 1.4% of total assets while the absolute value of abnormal accruals averages 6.9% of total assets.

[Insert table 1]

As illustrated in Table 2, the web-based financial reporting score is on average 6.25. Internal consistency estimates (Cronbach's alpha on score components) show that the variance is quite systematic (alpha= 0.71 for Profitability and 0.68 for Solvency). This is slightly higher than Botosan (1997) who finds an alpha of 0.64 for an index including five categories of disclosure in annual reports. Cronbach's alpha estimates the proportion of variance in the test scores that can be attributed to a true score variance. It can range from 0 (if no variance is consistent) to 1.00 (if all variances are consistent). According to Nunnaly (1978), a score of 0.70 is acceptable.

[Insert table 2]

Table 3 presents correlations. Consistent with our expectation, Abnormal accruals are positively associated with share price volatility (0.27) and negatively associated with Board size (-0.15). Web-based financial reporting is negatively related to Share price volatility (-0.15) and to Systematic risk (-0.16). We also observe an association between Board size (-0.37), Audit committee size (-0.33), and share price volatility.

[Insert table 3]

Multivariate analyses

Since we posit that a firm's information dynamics affect web-based financial reporting, earnings quality and share price volatility simultaneously, we first assess whether or not interaction exists between these variables using a Hausman test. Using this procedure, we reject

the null hypothesis of no endogeneity with respect to *Share price volatility* and *Financial reporting* (t-test = 1.73; p < 0.08) and concerning *Financial reporting* and *Abnormal accruals* (t-test = 1.60; p < 0.11). Therefore, web-based financial reporting, abnormal accruals and share price volatility will be treated as endogeneous variables. We rely on a three-stage estimation three-stage estimation model and the seemingly unrelated regression (SURE) method is used. The software being used is STATA.

SURE may improve the efficiency of parameter estimates when there is contemporaneous correlation of errors across equations. In practice, the contemporaneous correlation matrix is estimated using OLS residuals. It is also worth noting that the greater the intra-equation multicollinearity the more likely it is to have a considerable gain in efficiency for the entire system of SURE (Binkley 1982). We do not observe high correlation of errors across equations for our sample since the higher correlation coefficient between residuals is between *Abnormal accruals* and *Financial reporting* (0.06). Concerning intra-equation multicollinearity, we observe that *Board size* is correlated at 0.95 with *Board size squared* while variables *Board size* and *Audit committee size* are correlated at 0.55. Therefore, since multicollinearity could a problem, SURE is likely to improve the efficiency of the entire system (Binkley 1982).

Table 4 reports results of a three-stage estimation model regarding the simultaneous test of earnings quality, web-based financial reporting and share price volatility.

Concerning the determinants of share price volatility, consistent with hypothesis 1, results show a negative and significant relationship between *Share price volatility* and *Financial reporting* (-0.032; p < 0.030) and a positive relationship with *Abnormal accruals* (1.772; p < 0.003), which is consistent with hypothesis 2. We also observe that coefficients for *Board size* (-0.428; p < 0.033) and *Audit committee size* (-0.201; p < 0.028) are negative and significant. We

also observe that the coefficient for *Board size squared* is positive and significant (0.016; $p < 0.077$), suggesting a non-linear relationship between *Board size* and *share price volatility*.

Consistent with hypothesis 3, with respect to the determinants of web-based financial reporting, we observe that information on abnormal accruals is associated with less transparency in web-based reporting (-4.454; $p < 0.084$). As for the determinants of earnings quality, as measured by *Abnormal accruals* in absolute value, we observe that web-based financial reporting is associated with a reduction in abnormal accruals (-0.004; $p < 0.061$). This would imply that managers who engage in earnings management are less inclined to be transparent in their financial reporting practices and vice versa.

Consistent with hypothesis 4, our results show that an independent board (2.110; $p < 0.017$) increases disclosure transparency. This result is consistent with Chen and Jaggi (2000) who document that a board comprising mostly independent non-executive directors is more likely to be associated with comprehensive financial disclosure.

Our results also show that *Board size* (-0.047; $p < 0.061$) and *Audit committee size* (-0.031; $p < 0.014$) increase earnings quality, which is consistent with hypothesis 5. We also observe that the coefficient for *Board size squared* is positive and significant (0.002; $p < 0.061$), suggesting a non-linear relationship between *Board size* and *Share price volatility*. Moreover, consistent with Chang and Sun (2009), we do not observe any statistical relationship between *Abnormal accruals* and *Board independence*.

[Insert table 4]

As a first sensitivity analysis, we estimate our simultaneous equations model replacing *Share price volatility* by *Tobin's Q*. The equation is the following:

Tobin's Q $_{it}$ =

f ($\flat_0$ + $\flat_1$ Inverse of assets + $\flat_2$ Board independence $_+$ $\flat_4$ Board size + $\flat_5$ Board size squared + $\flat_6$ Audit committee size + $\flat_8$ Abnormal accruals $\flat_9$ Financial reporting) $_{it}$

Results (not tabulated) show that low earnings quality as measured by *Abnormal accruals* in absolute value is negatively related to Tobin's Q while the coefficient for the variable *Financial reporting* is not significant.

As a second sensitivity analysis, we add the interaction term *Abnormal accruals X Financial reporting* to the regression. Results presented in table 5 show that the coefficient for the interaction term is positive and significant (0.395; $p < 0.021$ one-tailed). The coefficient for the variable *Abnormal accruals* is negative and significant (-3.237; $p < 0.006$ one-tailed). This result might suggest that market participants give more credibility to lower quality earnings for firms that are more transparent in their financial reporting. Finally, we also observe that *Board independence* is positively related to Tobin's Q (0.441; $p < 0.017$ one-tailed). An independent board does not seem to reduce asymmetry in the stock market but appears to be an element of value creation as measured by Tobin's Q. This result is consistent with Chang and Sun (2009) who observe a significant positive association between earnings informativeness as measured by earnings response coefficient and board independence in the post-SOX period.

[Insert table 5]

Prior research assumes that quantitative information is more informative than indicative or qualitative information (e.g., Al-Tuwaijri, Christensen and Hughes, 2004; Cormier, Aerts, Ledoux and Magnan, 2009). Mercer (2004) argues that information precision is one of the information attributes underlying disclosure credibility. One reason for quantitative information to be more credible than soft, qualitative, information is that it increases the ex post verifiability of the information disclosed (Hutton, Miller and skinner, 2003). As a last sensitivity analysis, we assess the impact of precision attribute financial reporting on information asymmetry. Hence, we run three separate sets of simultaneous equations in turn including 1) indicative financial reporting, 2) qualitative financial reporting, and 3) quantitative financial reporting. Results (not tabulated) show that indicative financial reporting is neither related to abnormal accruals (-0.038; $p < 0.172$) nor share price volatility (0.302; $p < 0.330$). Qualitative financial reporting is associated with less abnormal accruals (-0.136; $p < 0.039$) while not affecting share price volatility (0.168; $p < 0.776$). Finally, quantitative financial reporting is negatively related to abnormal accruals (-0.006; $p < 0.006$) and is associated with less share price volatility (-0.029; $p < 0.044$). This result provides further evidence that the level of information precision in voluntary financial reporting affects its impact on earnings quality and information asymmetry between managers and investors.

CONCLUSION

In this paper, we build on prior literature on voluntary disclosure by investigating the simultaneous interactions between the extent of voluntary web-based financial reporting, earnings quality and information asymmetry between managers and investors. We argue that web-based reporting increases earnings quality and vice versa and that such transparency translates into a reduction of information asymmetry between managers and investors. Our findings are consistent with those expectations. We innovate by investigating the impact of web-based financial disclosure on earnings quality and information asymmetry taking into account a firm's governance attributes.

Our findings show that web-based financial reporting is associated with higher earnings quality while earnings quality and web-based financial reporting reduce information symmetry between managers and investors.

Concerning the impact of governance attributes on these simultaneous relationships, results show that an independent board of directors translates into more transparency in web-based financial reporting while board size and audit committee size seem to reduce earnings management and share price volatility. We also observe a non-linear relationship between board size, earnings quality, and share price volatility. This finding confirms prior studies assuming an inverse relationship between board size and information asymmetry due to the lack of coordination and communication associated with a large board.

It appears that a firm's web-based financial reporting affects its share price volatility. From this finding, one could infer that corporate disclosure is not purely symbolic or impression management but an attempt by managers to convey information to stockholders that is value-

added. However, the fact that the level of web-based financial reporting is affected by a firm's earnings quality and governance attributes implies that the intention by managers to convey relevant information is not completely exempt from impression management. This highlights the importance to account for simultaneous relationships between earnings quality, voluntary financial reporting and information asymmetry on the stock market.

Our results also suggest that market participants give more credibility to lower quality earnings for firms that are more transparent in their financial reporting since, in this case, Tobin's Q is less negatively affected.

Finally, our findings highlight that efficient governance may have a positive impact on earnings quality and in reducing stock market asymmetry, especially in a country like Canada where there is extensive investor protection. In other words, corporate governance is more likely to be credible within an effective legal system.

The results of this study should be interpreted with caution at least for three reasons. First, our measure of web-based financial reporting is based upon a coding instrument that makes some explicit assumptions about the value and relevance of information. Second, as in all other earnings management studies, the present study relies on specific measures of abnormal accruals that may not completely capture the underlying phenomenon. Finally, sample size may be an issue. However, sample firms do represent a wide cross-section of Canada's industries as well as a significant proportion of the country's total stock market capitalization.

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Table 1

Descriptive statistics
Financial and governance variables

	Minimum	Maximum	Mean	Standard deviation
Total accruals	-0.961	0.778	-0.059	0.114
Abnormal accruals	-0.920	1.114	0.014	0.166
Abnormal accruals in absolute value	0.001	1.114	0.069	0.152
Share price volatility (Standard deviation of daily change in share prices)	0.818	10.385	2.233	1.494
Systematic risk	0	2.71	0.682	0.489
Analyst following	0	35	6.829	5.888
Free float	0.098	0.999	0.776	0.225
Firm size (millions of Can $)	26	40 076	4 844	7 226
Board independence	0	2	0.909	0.515
Independent directors	0	0.860	0.360	0.178
Board chair duality	0	1	0.200	0.401
Board size	4	18	9.987	2.755
Audit committee size	2	9	3.980	1.103

Table 2
Web-Based Financial Reporting

	Min.	Max.	Mean	Std Dev.	Cronbach Alpha
Solvency	0	9	1.52	2.51	0.68
Profitability	0	15	4.73	3.78	0.71
Total	0	24	6.25	5.79	

Table 3
Correlations

		2	3	4	5	6	7	8	9	10
1	Abnormal accruals (absolute value)	-0.12	*0,27	*-0,15	0,05	0,08	*-0,14	*-0,19	-0,01	*-0.37
2	Financial reporting	1	*-0.15	-0.04	*-0.16	*0.16	0.03	-0.01	-0.01	0.03
3	Share price volatility		1	*-0,14	*0.26	-0,07	*-0,37	*-0,33	0,06	*-0.44
4	Analyst following			1	*0,20	-0,09	0,03	0,06	*0,12	*0.26
5	Systematic risk				1	0,06	*-0,12	*-0,13	*0.17	-0.11
6	Board independence					1	0,11	0,09	*0,12	-0.07
7	Board size						1	*0,55	*-0,12	*0.53
8	Audit committee size							1	0,05	*0.42
9	Free float								1	*-0.14
10	Firm size									1

* Significant at 0.10

Table 4
Three-Stage Estimation of the Determinants of
Web-Based Reporting, Earnings Management and Share Price Volatility

Dependent variable : **Financial reporting**				
Abnormal accruals (absolute value)	-	-4.454	-1.38	**0.084**
Analysts	+/-	-0.023	-0.27	0.786
Board independence	+	2.110	2.11	**0.017**
Board size	+	0.392	0.32	0.372
Board size squared	-	-0.015	-0.26	0.396
Audit committee size	+	-0.512	-0.95	0.171
Firm size	+	0.053	0.13	0.449
Adjusted R^2	15.2%			
Chi2 (P value)	26.3(0.03)			
Dependent variable : **Abnormal accruals (absolute value)**				
Analysts	+/-	-0.004	-1.67	**0.094**
Board independence	-	0.043	1.60	0.110
Board size	-	-0.047	-1.54	**0.061**
Board size squared	+	0.002	1.55	**0.061**
Audit committee size	-	-0.031	-2.19	**0.014**
Financial reporting	-	-0.004	-1.54	**0.061**
Adjusted R^2	8.3%			
Chi2 (P value)	14.3 (0.02)			
Dependent variable : **Share price volatility**				
Systematic risk	+	0.615	2.83	**0.002**
Free float	-	0.695	1.39	0.163
Analyst	-	-0.038	-2.05	**0.020**
Board independence	-	0.044	0.22	0.829
Board size	-	-0.428	-1.83	**0.033**
Board size squared	+	0.016	1.43	**0.077**
Audit committee size	-	-0.201	-1.91	**0.028**
Abnormal accruals (absolute value)	+	1.772	2.73	**0.003**
Financial reporting	-	-0.032	-1.87	**0.030**
Adjusted R^2	30.7%			
Chi2 (P value)	61.2(0.00)			

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

Table 5
Three-Stage Estimation of the Determinants of
Web-Based Reporting, Earnings Management and Tobin's Q

Dependent variable : Financial reporting				
Abnormal accruals (absolute value)	-	-4.746	-1.48	**0.077**
Analysts	+/-	-0.014	-0.17	0.868
Board independence	+	2.081	2.06	**0.019**
Board size	+	0.435	0.36	0.362
Board size squared	-	-0.017	-0.29	0.385
Audit committee size	+	-0.509	-0.91	0.362
Firm size	+	-0.016	-0.04	0.970
Adjusted R^2	15.2%			
Chi2 (P value)	25.4(0.03)			
Dependent variable : Abnormal accruals (absolute value)				
Analysts	+/-	-0.004	-1.71	**0.043**
Board independence	-	0.043	1.55	0.122
Board size	-	-0.045	-1.44	**0.075**
Board size squared	+	0.002	1.44	**0.074**
Audit committee size	-	-0.031	-2.10	**0.014**
Financial reporting	-	-0.004	-1.50	**0.065**
Adjusted R^2	8.2%			
Chi2 (P value)	13.9(0.03)			
Dependent variable : Tobin's Q				
Inverse of assets	+	1.212	4.14	**0.000**
Board independence	+	0.441	2.12	0.017
Board size	+	-0.152	-0.63	0.527
Board size squared	+	0.001	0.06	0.466
Audit committee size	+	0.244	2.19	**0.014**
Abnormal accruals (absolute value)	-	-3.237	-2.51	**0.006**
Financial reporting	-	-0.008	-0.44	0.659
Financial reporting X Abnormal accruals	+	0.396	2.04	**0.021**
Adjusted R^2	24.2%			
Chi2 (P value)	41.7(0.00)			

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

Appendix

Reporting grid

Liquidity
Indebtedness
Interest coverage
Total solvency
Net operating income
Gross margin
ROA or ROE
EPS (diluted)
Stock price or stock returns
EVA
Total profitability
Total financial reporting

Rating scale:
3: Item described in monetary or quantitative terms; 2: Item described specifically (qualitative);
1: Item discussed in general (indicative)