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## **AN EMPIRICAL EXAMINATION OF CORPORATE WEBSITES AS A VOLUNTARY DISCLOSURE MEDIUM**

Standards-setters, regulators and academics believe that corporate websites may enhance the flow of voluntary disclosure to the capital market and other stakeholders. Management's use of corporate websites for investor relations purposes is a common practice, yet we know little about how these websites affect investors. In this study, we analyze seven corporate websites disclosures categories to examine their predictive ability and their value relevance. The results show that the key non-financial statistics, projected information, information on intangible assets, social and environmental information, are associated with future revenue, future earnings and contemporaneous stock return. The paper contributes to the growing literature on websites disclosure and more generally to the literature on voluntary and strategic disclosure.

### **Introduction**

Over the last several years, the FASB, CICA and IASB have published reports that recommend that listed companies maintain a corporate website to make investor relations information readily available to stakeholders (FASB 2000, 2001; IASC 1999; Trites 1999). These reports support the regulator and standard setters view on the importance of the corporate website in enhancing firm's voluntary disclosure strategy. In Canada, the Ontario Securities Commission believes that the corporate website improves investor access to corporate information (OSC 2001) and in the US the SEC requires certain disclosures to be made on the registrant's website (SEC 2003). In this paper, we examine whether regulators (e.g. SEC and OSC) and standard setters (e.g. FASB and IASB) are justified in their belief. In particular, we test whether website disclosures on factors such as background information, summary of historical results, key non-financial statistics, projected information, intangible assets and social and environmental information are useful to predict changes in revenues and earnings or to explain contemporaneous stock returns. While research provides evidence that the extent of firm's website disclosure are positively associated with stock market transactions motivations (Debreceeny and Rahman 2005), relatively little research examines the usefulness of specific website disclosures.

To measure the nature and extent of online reporting to stakeholders we employ the seven disclosure categories set out in the FASB (2001) report on improving business reporting. Using Canada as a research environment, we collect background information, summaries of historical results, key non-financial statistics, projected information, management discussion and analysis, information on intangible assets, and social and environmental information and relevant capital markets data.

We find that the key non-financial disclosures are associated with future earnings, and contemporaneous stock returns. Projected information and information on intangible assets are associated with future revenue, future earnings and contemporaneous stock returns. Social and environmental information is associated with contemporaneous stock returns. In a contribution to the growing literature on Internet Financial Reporting (IFR), we provide evidence that corporate website disclosures provide relevant information to investors and suggest that some specific disclosures are particularly important. This finding complements the results of Asthana and Balsam (2001, 2004), Hodge et al. (2004) and Hodge and Pronk (2006), who also find evidence that online financial reporting of information results in more efficient, effective and timely dissemination of value relevant accounting information. We organize the remainder of this paper as follows: Section 2 describes the disclosures we analyze. We discuss related research in Section 3. Section 4 presents our research design. Sections 5 present the results. The final section provides conclusions, discusses the limitations of the study and sets out the implications for future research.

### **Corporate Website Disclosures**

Corporate website disclosures improve and accelerate access to financial information, increase the extent of such information (Ashbaugh et al. 1999; IASC 1999), and reduce the printing and distributing costs required by traditional financial reporting (TFR) in paper format (Beattie and Pratt 2003). The Web is a space where the firm can present and enhance the information published in more traditional media, drawing on the multimedia resources offered by Internet technology (Jones and Xiao 2004; Lymer et al. 2002; IASC 1999; Trites 1999). Studies on IFR fall into two main and complementary categories of disclosure, the content and format of disclosure and the impact of such disclosure on investor decision-making processes.

In respect of content and format, corporate Investor Relations (IR) websites may simply replicate TFR processes. The website provides another medium to disclose information presented in compliance with standards from securities regulators such as the SEC and OSC. The technological and cost advantages of the Internet provide an opportunity for the corporation to disclose performance information to stakeholders that is not required by regulators. The format of disclosure is also a key matter of concern. The Web can provide a means for rapid and cost-effective dissemination of static and textual information also available in a print format. The Web can also allow dissemination of active information, such as that generated from a database. Equally, the Web supports a wide variety of multimedia including audio, video and animations all of which can be in service of investor relations.

Studies that aim at a better understanding of IFR determinants show that size, activity sector, sophistication of users, performance, and dispersal of shareholders explain the variability of the two aspects of IFR : content and format of financial information presentation on corporate websites. Based on a sample of 660 firms from 22 countries, Debreceny et al. (2002) tested the relation between the Website's format and content and the size of the firm measured by stock market capitalization. The results of the ordinal logistic regression models show that format and reporting practices positively relate

to firm size. The authors conclude that large firms are more disposed to adopt a variety of reporting media, including their Website, to report more information at lower cost and in a more attractive way. Large firms have a large number of widely dispersed shareholders and, in this regard, the Internet constitutes an important tool for connecting with them. Debreceny et al. also found that the level of technology employed in firm value-adding processes and capital market valuation of the firm, particularly for highly valued entities, were positively associated with the nature and level of IFR.

Ettredge et al. (2002) distinguishes the mandatory publication of firm-performance information, particularly annual or quarterly reports, from information published voluntarily. They find no significant association between the two types of IFR and the firm's performance measured by stock returns. Pirchegger et al. (1999) analyzed the relation between several aspects of IFR and shareholding structure for a sample of 31 Austrian and German firms. They compiled indices grouping these aspects into four categories: reporting procedures used on the Web, technology used, synchronization and support provided to the user. Their results document a positive and statistically significant association between IFR aspects and shareholder dispersal.

The main contribution of these studies resides in the benchmark they offer for assessing, first, the emergence and then the evolution of IFR (Lymer et al. 2002). Lymer et al. (2002) warns, however, that most of these studies have little theoretical foundation, given their exploratory nature. Furthermore, the IFR literature takes a primarily preparer-oriented perspective. We extend this line of literature by reconciling it with recent user-oriented perspectives such as those reviewed by Penman (2003) and Schipper and Vincent (2003). In this paper, we examine if users find these technological enhancements useful in better understanding the economic prospects of a firm.

The second category of studies examines the impact of IFR content and format on investors' decision-making processes. Asthana and Balsam (2001, 2004), Hodge et al. (2004) and Hodge and Pronk (2006) have examined the usefulness of format and content of online financial reporting information.

Hodge et al. (2004) use an experiment to investigate whether the use of a search-facilitating technology affects how individuals react to recognition versus disclosure of stock option compensation. They find that the use of search-facilitating technology reduces differences in non-professional investors' financial performance judgments and investment decisions created by recognition versus disclosure of stock options. Asthana and Balsam (2004) examine the effect of filing form 10-K on EDGAR on the incidence of small and large trades. They find that the change to EDGAR filings results in significant increases in the volume of small, but not large trades, during the five day window (-1, 3) around the filing date. Furthermore, using stock return as a proxy for the information content of the 10-K, they results show that post-EDGAR small trades are more likely to reflect that information, i.e., more likely than in the pre-EDGAR period to be buys (sells) when returns in the five day window after the trade are positive (negative).

Hodge and Pronk (2006) examine whether professional and nonprofessional investors use different online quarterly financial information when making investment decisions, and whether the online information they use depends on whether they are researching a new investment or evaluating a current investment. They find that professional investors prefer to view PDF-formatted quarterly reports and tend to rely directly on the financial statements compared to nonprofessional investors who prefer to view HTML-formatted reports and have a tendency to rely more on management's discussion of the



quarter's results. The results also document that for nonprofessional investors, investment familiarity (i.e., whether they are evaluating a current investment or researching a new investment) strongly affects the type of financial information they view within a firm's quarterly reports.

Asthana and Balsam (2004), Hodge et al. (2004) and Hodge and Pronk (2006) findings suggest that search- facilitating technology, format of disclosure and Web disclosure improves the transparency of financial statement information. We extend this literature in two ways. First by examining the incremental content of voluntary information disclosed exclusively on the corporate website, we extend Asthana and Balsam (2004). This study addressed online reporting of disclosures that were mandatory in other forms. Second, we use content analysis to assess the extent of seven categories of disclosure on the corporate website. Our empirical models test the incremental content of these seven disclosure categories. Hence, we extend Hodge and Pronk (2006) who examine the usefulness of Web disclosure format.

In addition to the above studies, other research examines the relevance of financial and non-financial information from sources other than the corporate website. For instance, Jones and Cole (2004) examine disclosures by retailers made in managements' disclosure and analysis (MD&A). They considered the usefulness of information on the sources of revenue changes (comparable store sales growth, store openings and store closings) and of two measures of future capital resource plans (planned store openings and capital expenditures). They find that these variables contribute incremental explanatory power in future revenues, future earnings and contemporaneous stock return regressions that include financial statement variables. Our study uses similar methodology. The focus of our paper differs, however, as we examine voluntary disclosures made available largely exclusively on the corporate website.

## **Research Design**

### ***Sample selection***

We choose Canada to investigate the research questions set out above for two important reasons. First, the Canadian market, while substantial, is sufficiently contained for us to hand collect data for a significant proportion of market capitalization. Second, the litigation risk is lower in the Canadian stock market as compared with the USA (Baginski et al. 2002). For example, Grossman (1996) argues that class action suits against corporations remain a rarity in Canada. Given the necessarily forward looking and relatively fluid nature of corporate reporting on the Web, lowered litigation risk allows corporations to make more investor-useful disclosures.

As shown in Table 1, we draw a sample of 180 firms from the population of firms listed on the Toronto stock exchange as disclosed in the Stock Guide database. Of the 180 firms selected, we exclude 16 firms from the financial sector; ten firms as they were suspended or removed from the base and a further ten because the *Infominder* software<sup>1</sup> could not detect the periodic updates made by the firm. We exclude some 36 firms due to unavailability of accounting or stock market data. The final sample consists of 108 firms. We perform content analysis for the period September 2002 to December 2002. *Infominder* advises us of any CWS change made by the sample firms during that time. A total of 57 firms do disclose additional voluntary information on their website.

Insert Table 1 about here

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<sup>1</sup> *InfoMinder* is a service for searching and detecting changes and updates of Web pages.

## *Disclosure Instrument*

We examine the seven disclosure categories suggested by the FASB (2001). Voluntary disclosures of this broad class have been shown to reduce firm's cost of capital (Botosan 1997) and to be value-relevant (Bryant 1997). These disclosure categories are background information, summary of historical results, key non-financial statistics, projected information, management discussion and analysis, information on intangible assets, social and environmental information. We now address each of these disclosure categories in more detail:

### *Background information*

Background information such as statement of goals, strategies adopted, main line of products manufactured, firm's principal markets as well as a description of its competitive environment can be useful to investors in as much as they provide a context for interpreting the detailed financial information published by the firm (Botosan 1997).

### *Summary of historical results*

According to the survey conducted by SRI International (1987), individual or professional investors consider the historical summary of results to be important or even crucial. Access to the historical summary of annual and quarterly financial results facilitates the analysis of trends (Botosan 1997).

### *Key non-financial statistics*

Non-financial statistics are indicators that are not normally presented in financial statements and cover such as: number of employees, average age of key employees, market share, and the input/product ratio. The Jenkins Committee report (AICPA 1994) as well as the Kolton Committee (FASB 2001) recognize the utility of non-financial statistics for making investment decisions and encourage firms to publish them. Furthermore, the SRI International study indicates that 73.7% of professional investors recommend that firms disclose non-financial ratios and statistics.

### *Projected information*

The Kolton Committee report (FASB 2001) as well as that of the Jenkins Committee (AICPA 1994) also encourage firms to increase the extent of this category of information because of its importance for both investors and financial analysts. Moreover, research has shown the usefulness of reporting forward looking financial information (Lundholm and Myers 2002; Clarkson et al. 1999).

### *Management discussion and analysis*

The management discussion and analysis is an effective tool, allowing the firm to tell how it has created value for its shareholders and how it plans to continue doing so (CICA 2003). Barron et al. (1999) and by Clarkson et al. (1994) show the predictive utility of the management discussion and analysis. However, the Goodfellow Committee (CICA 2001), in explaining the motivation for establishing management discussion and analysis guidelines, expresses the concern that the information provided in such reports may sometimes lack both utility and clarity.

### *Information on intangible assets*

This category includes information on intangible assets not recognized in financial statements. We add this category to the Botosan (1997) disclosure index given the growing importance and relevance of intangible assets for both firms and investors. According to the Kolton report (FASB 2001), voluntary disclosures on intangible assets such as research and development, human resources, customer relations, and innovations are particularly useful in making investment decisions.

### *Social and environmental information*

Social and environmental information includes the statement of the firm's social objectives and the description of its social commitments through specific projects (community involvement, cultural, recreational, and sports activities). It also includes the description of activities reducing the pollution linked to the firm's activities as well as its undertakings linked to the treatment, management or recycling of waste products. Blacconiere and Patten (1994) and Cormier and Magnan (1997) confirm the informational content of social and environmental reporting.

We measure the difference between disclosure on the Web (IFR) and mandated disclosures made through traditional means (TFR). In Canada, the SEDAR system, managed by the Canadian Securities Administrators ([www.sedar.com](http://www.sedar.com)) is the primary vehicle for TFR. The extent of additional information disclosure on the Internet (EAD<sub>ci</sub>) on each disclosure category is assessed using content analysis methodology. Appendix 1 and Appendix 2 present our disclosure index as well as the scoring procedure. EAD is the difference between the IFR scores (SIFR) and the TFR scores (STFR). We use mandated firm disclosures on the SEDAR system as a calculated using the following formulas:

$$STFR = \sum_{i=1}^7 SCORE_i \quad (1)$$

where SCORE<sub>i</sub> is equal to the number of points awarded the firm for each category *i*, *i* = 1...7, after the content analysis of TFR on SEDAR;

$$SIFR = \sum_{j=1}^7 SCORE_j \quad (2)$$

where SCORE<sub>j</sub> is equal to the number of points awarded the firm for category *i*, *i*=1..7, after the content analysis of the firm's Website. Consequently, the score of the extent of the additional information on the Internet (ÉIAI) for each one of the seven disclosure categories will equal:

$$EAD_{ci} = SIFR - STFR \quad (3)$$

EAD<sub>ci</sub>: Score measuring the extent of additional voluntary disclosure on the Internet for each one of the seven disclosure categories:

BI <sub>it</sub> :	background information
SHR <sub>it</sub> :	summary of historical results
KNFS <sub>it</sub> :	key non-financial statistics
PINF <sub>it</sub> :	projected information
MD&A <sub>it</sub> :	management discussion and analysis
IA <sub>it</sub> :	information on intangible assets
SEI <sub>it</sub> :	social and environmental information.

SIFR<sub>ci</sub>: Score measuring the extent of voluntary disclosure on the firm's Website for each one of the seven disclosure categories:

BI <sub>it</sub>	background information
SHR <sub>it</sub>	summary of historical results
KNFS <sub>it</sub>	key non-financial statistics
PINF <sub>it</sub>	projected information
MD&A <sub>it</sub>	management discussion and analysis
IA <sub>it</sub>	information on intangible assets
SEI <sub>it</sub>	social and environmental information.

STFR<sub>ci</sub>: Score measuring the extent of voluntary disclosure on traditional financial reporting media for each one of the seven disclosure categories:

BI <sub>it</sub>	background information
SHR <sub>it</sub>	summary of historical results
KNFS <sub>it</sub>	key non-financial statistics

PINF <sub>it</sub>	projected information
MD&A <sub>it</sub>	management discussion and analysis
IA <sub>it</sub>	information on intangible assets
SEI <sub>it</sub>	Social and environmental information.

## Empirical Models

We test whether the background information, summary of historical results, key non-financial statistics, projected information, management discussion and analysis, information on intangible assets, and social and environmental information contribute additional explanatory power when included in regressions where the dependent variables are future (one-year-ahead) changes in revenues, future changes in earnings, and contemporaneous stock returns.

Selection bias occurs when the dependent variable is partially observable. In this study, we face this problem as the results of our content analysis of documents for the 51 firms that do not provide additional disclosure on their website. In the Heckman (1979) procedure, the residuals of the selection-equation in a logit model that analyze firm characteristics influencing managers' choice of the corporate website to provide additional disclosure are used to construct a selection bias control factor, the Inverse Mills ratio.

Decision = 1, if (SIFR-STFR > 0), firm<sub>i</sub> uses its website to provide additional voluntary disclosure and to broaden access to its financial information.

Decision = 0, if firm<sub>i</sub> does not use to provide additional voluntary disclosure and to broaden access to its financial information.

$$\text{Decision}_i = \alpha_0 + \alpha_1 \text{PI}_i + \alpha_2 \text{INSIDE}_i + \alpha_3 \text{COMPLEX}_i + \alpha_4 \text{R\&D}_i + \alpha_5 \text{PERF}_i + \alpha_6 \text{FIN}_i + \alpha_7 \text{LISTING}_i + \alpha_8 \text{COMPET}_i + \alpha_9 \text{HERF}_i + \alpha_{10} \text{RISK}_i + \alpha_{11} \text{SIZE}_i + \alpha_{12} \text{NAF}_i + \alpha_{13} \text{BIG}_i + \alpha_{14} \text{SIC}_i + \varepsilon_i$$

Firm characteristics influencing managers' choice of the corporate website are presented in the seven categories described earlier in the paper. We draw upon the extensive literature on firm disclosure to position explanatory variables typically associated with enhanced disclosures (Healy and Palepu 2001; Francis et al. 2002; Lundholm and Myers 2002; Bushman et al. 2004; Dye 2001).

*Pressure from Investors* variables include:

PI	monthly average of shares traded/average of shares circulating from January to December 2001
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*Ownership Structure* variables include:

INSIDE	percentage of shares held by executives and major shareholders
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*Complexity* variables include:

COMPLEX	book value/market value ratio
R&D	natural logarithm of current spending on research and development

*Search for visibility* variables include:

PERF	firm's performance measured by a dichotomous variable obtained by comparing the net income earned in 2002 (NP2002) and that achieved in 2001 (NI2001). PERF=1 if NI 2002>NI 2001 and otherwise 0
------	--

FIN	issuing shares or debt, variable that takes the value of 1 if the firm has issued shares or debt in 2003, 2002 or 2001 and otherwise 0
LISTING	listing on a foreign exchange, dichotomous variable that takes the value of 1 if the firm is cross listed, otherwise 0

Competition variables include:

COMPET	average returns on equity of the firm over the last 5 years
HERF	Herfindahl index constructed using quarterly Stock Guide database

Litigation variables include:

RISK	standard deviation of adjusted stock market returns over the previous 10 years,
SIZE	natural logarithm of the firm's total assets
NAF	the average number of analyst following the firm during 2000
BIG	takes the value of 1 if the firm is audited by one of the big 4 firms, otherwise 0.
ICS	SIC is a dummy variable based on firm's one digit SIC code

To test the incremental information content of IFR, we follow Bryant (1997), Gu and Lev (2004) and Jones and Cole (2004). We estimate the following three regressions, shown in Models 1 to 3. We use the Inverse Mills Ratios as an additional independent variable to control for selection bias in information content regression.

$$Ret_{it} = \alpha_0 + \alpha_1 NI_{it} + \alpha_2 NI_{it-1} + \alpha_3 BI_{it} + \alpha_4 SHR_{it} + \alpha_5 KNFS_{it} + \alpha_6 PINF_{it} + \alpha_7 MD\&A_{it} + \alpha_8 IA_{it} + \alpha_9 SEI_{it} + IMR_{it} + \varepsilon_{it} \quad (1)$$

$$Ch\_Rev_{it+1} = \alpha_0 + \alpha_1 NI_{it} + \alpha_2 Ch\_NI_{it} + \alpha_3 Rev_{it} + \alpha_4 Ch\_Rev_{it} + \alpha_5 CapExp_{it} + \alpha_6 Ch\_CapExp_{it} + \alpha_7 BI_{it} + \alpha_8 SHR_{it} + \alpha_9 KNFS_{it} + \alpha_{10} PINF_{it} + \alpha_{11} MD\&A_{it} + \alpha_{12} IA_{it} + \alpha_{13} SEI_{it} + IMR_{it} + \varepsilon_{it} \quad (2)$$

$$Ch\_NI_{it+1} = \alpha_0 + \alpha_1 NI_{it} + \alpha_2 Ch\_NI_{it} + \alpha_3 Rev_{it} + \alpha_4 Ch\_Rev_{it} + \alpha_5 CapExp_{it} + \alpha_6 Ch\_CapExp_{it} + \alpha_7 BI_{it} + \alpha_8 SHR_{it} + \alpha_9 KNFS_{it} + \alpha_{10} PINF_{it} + \alpha_{11} MD\&A_{it} + \alpha_{12} IA_{it} + \alpha_{13} SEI_{it} + IMR_{it} + \varepsilon_{it} \quad (3)$$

Where the dependent variables are:

Ret <sub>it</sub>	company <i>i</i> 's stock return of fiscal year <i>t</i> divided by the market value at the beginning of the accounting period;
Ch_Rev <sub>it+1</sub>	change in revenue of firm <i>i</i> in year <i>t+1</i> divided by total assets at the beginning of the accounting period
Ch_NI <sub>it+1</sub>	Change in net income before extraordinary items of firm <i>i</i> in year <i>t+1</i> divided by total assets at the beginning of the accounting period;

The Web disclosures variables are:

BI <sub>it</sub>	background information;
SHR <sub>it</sub>	summary of historical results,
KNFS <sub>it</sub>	key non-financial statistics
PINF <sub>it</sub>	projected information
MD&A <sub>it</sub>	management discussion and analysis
IA <sub>it</sub>	information on intangible assets,
SEI <sub>it</sub>	Social and environmental information.

The financial statement control variables are:

NI <sub>it</sub> & NI <sub>it-1</sub>	firm <i>i</i> 's earnings before extraordinary items for fiscal year <i>t</i> and <i>t-1</i> divided by total assets at the beginning of the accounting period
Ch_NI <sub>it</sub>	The change in net income earnings before extraordinary items of firm <i>i</i> in year <i>t</i> divided by total assets at the beginning of the accounting period

Rev <sub>it</sub>	Revenues of firm <i>i</i> in year <i>t</i> divided by total assets at the beginning of the accounting period
Ch_Rev <sub>it</sub>	Change in revenues of firm <i>i</i> in year <i>t</i> divided by total assets at the beginning of the accounting period
CapExp <sub>it</sub>	Capital expenditures of firm <i>i</i> in year <i>t</i> divided by total assets at the beginning of the accounting period
Ch_CapExp <sub>it</sub>	Change in capital expenditures of firm <i>i</i> in year <i>t</i> divided by total assets at the beginning of the accounting period
IMR <sub>it</sub>	selection bias control factor.

## Results

### *Descriptive Statistics*

When compared with TFR, the information published on corporate Websites may be either disaggregated or incremental (Ashbaugh et al. 1999). Disaggregated information expands what previous aggregated disclosures in TFR for use on the Website. Incremental information includes all the information published exclusively on the Website.

Insert Figure 1 about here

Figure 1 compares disaggregated disclosure to incremental disclosure. It highlights the fact that, except for the “summary of historical results” (SHR) and “management discussion and analysis” (MD&A) categories, financial disclosure on the Websites of Canadian firms is mostly incremental.

Table 2 presents descriptive statistics on the additional information disclosed by Canadian firms. Our description distinguishes between disaggregated and incremental information. Table 2 shows that the background incremental information (BI) information score varies between 0 and 10 with an average of 4.16. Background information may, for example, take the form of a discussion of the impact of entry barriers on current profit (example: Advantage Energy Income Fund). It may also consist in identification of the firm’s main markets and of their specific characteristics (examples: Advantage Energy Income Fund, AFM Hospitality Corporation, Air Canada, Southernera Resource Limited). Moreover, certain firms disclose information on the competitive environment’s impact on future profits (Boralex, Canadian Hydro Developers Inc., McCoy Bros Inc. and Vermilion Resources LTD).

Insert Table 2 about here

As concerns key non-financial statistics (KNFS), the average score for this category is a mean of 4.49 in a 10-point scale. Some companies disclose increased sales of units on their Websites (Aber Diamond Corporation, Advantage Energy Fund and Logistec) or an increase in their market share (Astral Media, Peyto Exploration & Development). Other firms disclose the list of their key employees (AFM Hospitality Corporation, Microcell, SNC Lavalin Group Inc.).

Table 2 shows that incremental disclosure includes projected information. Indeed, this category has the highest average score: 9.51. Some firms provide a comparison between current and forecasted earnings. Others disclose a comparison of current and forecasted annual sales. Some firms discuss the

implication of their sales-related opportunities and risks on their profitability or on their future capital or R&D expenditures. Finally, some firms disclose forecast about profits or sales.

The categories information on intangible assets (IA), primarily patents and licenses, and social and environmental information vary from a minimum score of 0 to a maximum score of 12, with an average score of 5.18 and 4.28 respectively. As concerns social and environmental information (SEI), companies disclose statements of their social objectives as well as a description of their donations, grants or financial contributions. Other firms include a description of the anti-pollution activities linked to their operations and the actions undertaken to treat, manage or recycle products and waste.

Table 3 presents the descriptive statistics and the univariate tests on the mean differences between the characteristics of firms deciding to disclose incremental disclosure on their website and firms that do not. Table 2 shows that all the proxies for stock market transaction arguments are significantly different. For instance, significant differences do exist in the level of pressure from investors (PI) as well as that of risk of litigation (RISK).

There is a higher turnover in the shares of firms deciding to broaden the access to their information. They have a less concentrated ownership structure (INSIDE), publish more complex traditional financial information (COMPLEX), and have a higher R&D spending. These firms also tend to seek greater visibility. Indeed, table 3 shows that 40% of these firms are cross listed (LISTING) and that 54% have issued or plan to issue shares or debt (FIN). For firms that do not decide to publish additional information on the Internet, the proportion is clearly lower and stands at 13% and 23 % respectively.

Insert Table 3 about here.

Table 3 also shows that the standard deviation of adjusted stock market returns of firms deciding to broaden access to additional financial information is higher (0.0505) than for firms that do not. Consequently, they are more threatened by the risk of litigation.

With regard to the level of competition, Table 3 documents a higher Herfindahl index for firms that decide to provide voluntarily incremental information by Website disclosure. However, the difference is not significant with regard the average return on equity over the last 5 years. The industry level of competition may discourage managers from using the corporate website to disclose incremental information.

Results in table 4 show that pressure from investor ( $t = 4.012$ ;  $p < 0.000$ ), TFR complexity ( $t = 3.07$ ;  $p < 0.003$ ), search for visibility ( $t = 3.77$ ,  $p < 0.000$ ) litigation risk ( $t = 2.450$ ;  $p < 0.015$ ), and to a lesser extent competition are the main factors that discriminate between firms that provide incremental voluntary disclosure on the Internet and firms that do not.

Insert Table 4 about here

In our empirical analyses, we examine the role of the background information, summary of historical results, key non-financial statistics, projected information, management discussion and analysis, information on intangible assets, and social and environmental information.

### ***Stock returns regression***

We present evidence on the relationship between the corporate website disclosures categories and contemporaneous stock returns in Table 5. In specification (1), the level and change of NI are significantly associated with returns. Specification (1) regression explains 26.8% of the variation in returns.

Insert Table 5 about here.

To test whether the background information, summary of historical results, key non-financial statistics, projected information, management discussion and analysis, information on intangible assets, and social and environmental information, we include BI, SHR, KNFS, PINF, MD&A, IA, SEI as additional variables in specification (1). Table 5 document that background information, summary of historical results, key non-financial statistics, projected information, management discussion and analysis, information on intangible assets, and social and environmental information are highly significant and positively associated with returns. When the corporate website disclosures categories are included in the specification, the explanatory power of the model increases substantially, with the adjusted  $R^2$  increasing from 0.268 to 0.479. This sizable increase reflects the relevance of voluntary information posted on the corporate website. We compare the  $R^2$  from the two models to determine whether  $R^2$  from model 2 is significantly higher than model's 1  $R^2$ . The incremental  $F$ -statistic associated with testing model 2 against model one is significant at  $p < 0.05$ .

### ***Changes in revenues regression***

To measure the association between the corporate website disclosures categories and future financial variables, OLS regression is used. Table 6 presents results from regression where future change in revenues is the dependent variables. The first column of Table 6 presents the results from regression (2) where the only explanatory variables are the historical financial statement information. The level and change of net income and revenues and the level of capital expenditures are positively and significantly associated with one-year-ahead changes in revenues and the model is significant at a 0.05 level.

The results from the changes in revenues regression that includes the Web disclosures categories as additional variables are show in the second column of Table 6. Including Web disclosure categories increases the explanatory power from 0.234 to 0.328. Key non financial statistics, projected information, Information on intangible assets, and social and environmental information have a statistically significant positive association with the changes in revenue in the following period. The results indicated that certain Web disclosures categories are incrementally associated with on period-ahead changes in revenues. We compare the  $R^2$  from the two models to determine whether  $R^2$  from model 2 is significantly higher than model's 1  $R^2$ . The incremental  $F$ -statistic associated with testing model 2 against model one is significant at  $p < 0.05$ .

Insert Table 6 about here.

### ***Changes in income regression***

Table 7 presents results from the income regression. In the basic regression (3), with only financial statements variables, only the level of income, revenue and capital expenditures is statistically significant. The variables together explain 22.4% in future earning changes.



We report the results of Model 3 that includes Web disclosures categories as additional variables in the right column of Table 7. Key non-financial statistics, projected information, information on intangible assets and social and environmental information have a positive and significant association with future income changes. Including Web disclosures categories increases the explanatory power of Model 3 regression from 22.4% percent to 36.4%. We compare the  $R^2$  from the two models to determine whether  $R^2$  from model 2 is significantly higher than the  $R^2$  for model 1. The incremental  $F$ -statistic associated with testing Model 2 against Model 1 is significant at  $p < 0.05$ .

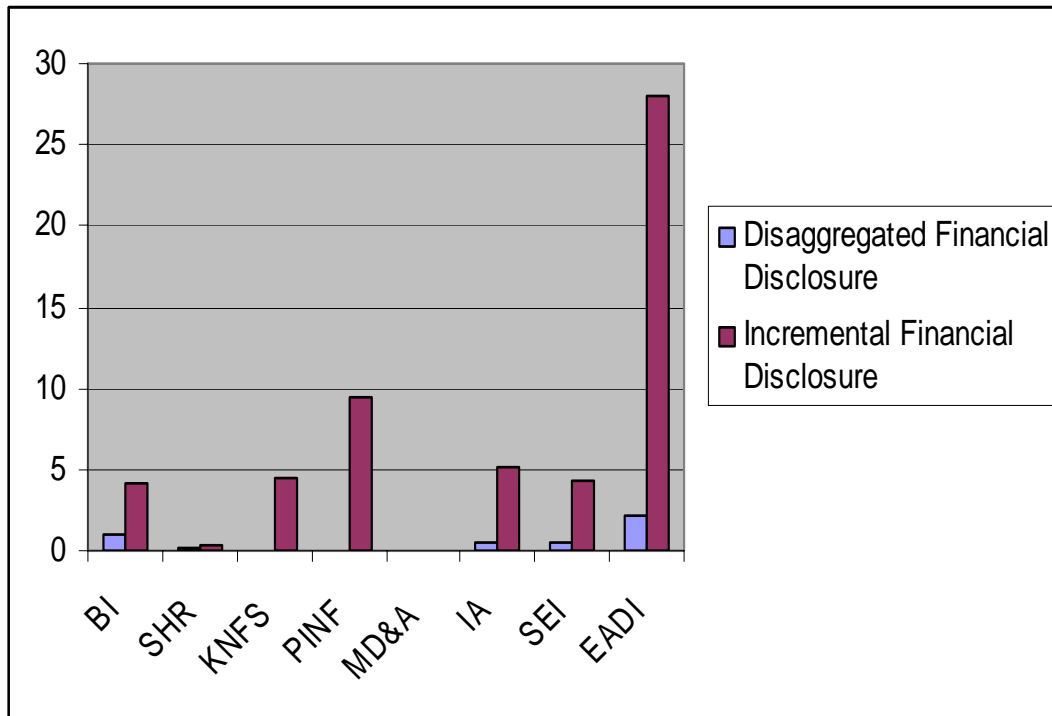
Insert Table 7 about here.

## **Conclusions**

In this paper, we examine the usefulness of several corporate website disclosure categories using a sample of 57 Canadian firms. We test whether background information, summary of historical results, key non-financial statistics, projected information, management discussion and analysis, information on intangible assets, and social and environmental information contain information that is associated with changes with contemporaneous stock returns, one-year-ahead changes in revenues and earnings. Our results document that Canadian firms provide useful information on their corporate website and suggest that the corporate website is a voluntary disclosure medium.

These findings support the views of the OSC, CICA, FASB, and academics that the corporate website can be used to enhance the voluntary disclosure policy of a firm and to improve the information flow to investors. Our findings complement those of Hodge and Pronk (2006) who find that professional investors prefer to view PDF-formatted quarterly reports and tend to rely directly on the financial statements compared to nonprofessional investors who prefer to view HTML-formatted reports and have a tendency to rely more on management's discussion of the quarter's results.

**Figure 1 : Disaggregated and incremental financial disclosure on the Internet**



Key:

**BI:** background information, **SHR:** summary of historical results, **KNFS:** key non-financial statistics, **PINF:** projected information, **MD&A:** management discussion and analysis, **IA:** information on intangible assets, **SEI:** Social and environmental information, **EADI:** the extent of the additional voluntary disclosure on the Internet (SIFR-STFR).

**Table 1 : Sample Selection**

<b>Description</b>	<b>Number of firms</b>
<b>Canadian firms in the August 3, 2002 issue of <i>Stock guide</i></b>	<b><u>1,094</u></b>
Random selection	180
Exclusion of firms in the financial sector	<u>16</u>
<b>Sub-sample</b>	<b><u>164</u></b>
Suspended firms	10
Firms whose Website updates could not be tracked by the <i>Infominder</i> software	10
Exclusion of firms whose accounting or stock market data were not available on the Stock Guide or on the Datastream data bases	<u>36</u>
Final Sample	<b><u>108</u></b>
Firm that provide additional disclosure	<u>57</u>

**Table 2 : Description of incremental disclosure and of disaggregated disclosure**

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>Panel A: Disaggregated disclosure</b>					
BI	57	0	3	1.04	1.117
SHR	57	0	3	.21	0.773
KNFS	57	0	0	.00	0.000
PINF	57	0	3	.07	0.417
MD&A	57	0	0	.00	0.000
IA	57	0	6	.42	1.149
SEI	57	0	7	.46	1.240
EADI	57	0	8	2.16	2.153
<b>Panel B: Incremental disclosure</b>					
BI	57	0	10	4.16	2.534
SHR	57	0	4	.30	.654
KNFS	57	0	10	4.49	2.487
PINF	57	0	25	9.51	5.613
MD&A	57	0	2	.04	.265
IA	57	0	12	5.18	3.112
SEI	57	0	12	4.28	3.347
EADI	57	4	48	27.98	10.621

Key:

**BI:** background information, **SHR:** summary of historical results, **KNFS:** key non-financial statistics, **PINF:** projected information, **MD&A:** management discussion and analysis, **IA:** information on intangible assets, **SEI:** Social and environmental information, **EADI:** the extent of the additional voluntary disclosure on the Internet (SIFR-STFR).

**Table 3 : Descriptive statistics and univariate tests on firm characteristics**

	Decision	N	Average	Minimum	Maximum	t-value sign. level	Z-value sign. level
<b>PI (in millions)</b>	1	57	37.900	117.200	165.289	1.270	<b>5.517</b>
	0	51	19.158	5.900	758.146	0.207	<b>0.000**</b>
<b>SHAREHOLDING</b>	1	57	25.581	0.1	79	<b>2.990</b>	<b>3.016</b>
	0	51	38.330	0.3	85.9	<b>0.003**</b>	<b>0.003**</b>
<b>COMPLEX</b>	1	57	0.6585	0.1021	1.9230	<b>3.067</b>	<b>2.442</b>
	0	51	1.1976	0.0407	6.2500	<b>0.003**</b>	<b>0.015**</b>
<b>R&amp;D (\$ millions)</b>	1	57	618.399	0	20426.067	<i>1.861</i>	<b>3.084</b>
	0	51	62.730	0	1868.658	<i>0,0711</i>	<b>0.020</b>
<b>PERF</b>	1	57	0.05	0	1	0.931	0.931
	0	51	0.10	0	1	0.354	0.352
<b>FIN</b>	1	57	0.54	0	1	<b>3.569</b>	<b>3.401</b>
	0	51	0.23	0	1	<b>0.001**</b>	<b>0.001**</b>
<b>LISTING</b>	1	57	0.40	0	1	<b>3.502</b>	<b>3.345</b>
	0	51	0.13	0	1	<b>0.001**</b>	<b>0.001**</b>
<b>COMPET</b>	1	57	-0.02255	-1.083	0.345	0.932	1.013
	0	51	-0.06576	-1.083	0.343	0.353	0,311
<b>HERFIN</b>	1	57	0.101	0.013	0.143	<b>2.509</b>	<b>3.016</b>
	0	51	0.020	0.002	0.0653	<b>0.014</b>	<b>0.003</b>
<b>RISK</b>	1	57	0.0505	0.0139	0.6572	<b>3.417</b>	<b>3.762</b>
	0	51	0.011	0.0039	0.4573	<b>0.001**</b>	<b>0.000**</b>
<b>SIZE (\$ millions)</b>	1	57	2265.143	2.957	29310.706	<b>2.781</b>	<b>5.528</b>
	0	51	235.232	1.302	5886.147	<b>0.006</b>	<b>0.000</b>
<b>NAF</b>	1	57	8.95	1	31	<i>1.902</i>	<b>2.390</b>
	0	51	5.83	1	26	<i>0.062</i>	<b>0.017**</b>
<b>BIG</b>	1	57	0.96	0	1	<i>1.885</i>	<i>1.864</i>
	0	51	0.87	0	1	<i>0.062*</i>	<i>0.062*</i>

**Key:**

**Decision** takes the value 1 if the firm discloses additional financial information on its Website, otherwise 0. The dependent variables are the following: PI: monthly average of shares traded/average of shares circulating from January to December 2001, INSIDE: percentage of shares held by executives and major shareholders, COMPLEX: book value/market value ratio, R&D: natural logarithm of current spending on research and development, PERF: firm's performance measured by a dichotomous variable obtained by comparing the net income earned in 2002 (NP2002) and that achieved in 2001 (NI2001). Perf=1 if NI 2002>NI 2001 and otherwise 0, FIN: issuing shares or debt, variable that takes the value of 1 if the firm has issued shares or debt in 2003,2002 or 2001 and otherwise 0, LISTING: listing on a foreign exchange, dichotomous variable which takes the value of 1 if the firm is cross listed, otherwise 0. COMPET: average returns on equity of the firm over the last 5 years, HERF: Herfindahl index constructed using quarterly Stock Guide data base, RISK: standard deviation of adjusted stock market returns over the previous 10 years, SIZE: natural logarithm of the firm's total assets, NAF: the average number of analyst following the firm during 2000, BIG: takes the value of 1 if the firm is audited by one of the big 4 firms, otherwise 0. ICS: SIC is a dummy variable based on firm's one digit SIC code.

**Table 4 : Determinants of the decision to use a Web site to broaden the access to additional voluntary disclosure: Logit results**

Dependent variable Decision	Sign	Estimation	z	P >  z
Constant		-5.5596	3.805	0.000
PI	(+)	<b>2.4954</b>	<b>4.012</b>	<b>0.000</b>
SHAREHOLD	(-)	-0.0028	1.28	0.200
COMPLEX	(-)	<b>-0.5351</b>	<b>3.07</b>	<b>0.002</b>
R&D	(+)	<b>0.4130</b>	<b>2.98</b>	<b>0.003</b>
PERF	(+)	0.8750	1.06	0.290
FIN	(+)	0.3218	1.26	0.206
LISTING	(+)	<b>1.0928</b>	<b>3.77</b>	<b>0.000</b>
COMPET	(-)	0.02160	0.43	0.667
HERF	(+)	<b>1.805</b>	<b>2.450</b>	<b>0.013</b>
RISK	(+)	<b>2.5894</b>	<b>2.43</b>	<b>0.015</b>
SIZE	(+)	<b>2.5239</b>	<b>2.86</b>	<b>0.004</b>
NAF	(+)	<b>0.0128</b>	<b>2.40</b>	<b>0.02</b>
BIG	+	<b>1.1000</b>	<b>2.02</b>	<b>0.043</b>
SIC	?	NS	NS	NS

Number of observations = 108 Wald chi2(20) = 44.37

Censored obs = 51

Prob > chi2 = 0.0013

Uncensored obs = 57

McFadden R-Squared = 0.2134

Key: Decision takes the value 1 if the firm discloses additional financial information on its Website, otherwise 0. The independent variables are the following. PI: monthly average of shares traded/average of shares circulating from January to December 2001. INSIDE: percentage of shares held by executives and major shareholders. COMPLEX: book value/market value ratio. R&D: natural logarithm of current spending on research and development. PERF: firm's performance measured by a dichotomous variable obtained by comparing the net income earned in 2002 (NP 2002) and that achieved in 2001 (NI 2001); PERF = 1 if NI 2002 > NI 2001 and otherwise 0. FIN: issuing shares or debt, variable that takes the value of 1 if the firm has issued shares or debt in 2003, 2002, or 2001, otherwise 0. LISTING: listing on a foreign exchange, dichotomous variable which takes the value of 1 if the firm is cross listed, otherwise 0. COMPET: average returns on equity of the firm over the last 5 years. HERF: Herfindahl index constructed using quarterly StockGuide database. RISK: standard deviation of adjusted stock market returns over the previous 10 years. SIZE: natural logarithm of the firm's total assets. NAF: the average number of analysts following the firm during 2000. BIG: takes the value of 1 if the firm is audited by one of the Big 4 firms, otherwise 0. SIC: a dummy variable based on firm's one-digit SIC code.

**Table 5 : Results of Annual Regression of Returns on Earnings Information and the Corporate Website Disclosure Categories**

<b>Independent Variables</b>	<b>Regression without Website disclosures categories (1)</b>	<b>Regression with Website disclosures categories (2)</b>
Intercept	0.176 (1.729)	0.129 (0.143)
NI	0.406** (3.138)	0.453** (3.727)
NI <sub>t-1</sub>	-0.270* (2.088)	-.311 (0.031)
BI		-1.008 (0.956)
SHR		1.152 (0.049)
KNFS		1.683* (2.438)
PINF		3.233** (5.631)
MD&A		-0.044 (0.739)
IA		2.093** (4.851)
SEI		-3.185* (2.714)
IMR		1.230 (2.514)*
Model Fit ( <i>F</i> )	2.099*	2.994*
Adj. R <sup>2</sup>	0.268	0.479
Model F Tests: Model 2 vs. Model, F = 8, 47 *		

\*\*, \* indicate statistical significance at the p = 0.01 and 0.05 levels, respectively (two-tailed test); T-statistics in parenthesis

**Ret<sub>i</sub>**: company i's stock return of fiscal year t; **NI<sub>t</sub>**; **NI<sub>t-1</sub>**: company i's earnings before extraordinary item for fiscal year t and t-1; **BI**: background information, **SHR**: summary of historical results, **KNFS**: key non-financial statistics, **PINF**: projected information, **MD&A**: management discussion and analysis, **IA**: information on intangible assets, **SEI**: Social and environmental information.; **IMR**: selection bias control factor.

**Table 6 : Association of Website Disclosures Categories with Future Revenues**

Independent Variables	Regression without Website disclosures categories	Regression with Website disclosures categories
Intercept	-1.603 (0.457)	0.166 (-.473)
NI	0.019 (2.100)*	0.017 (2.176)*
Ch_NI	0.075 (-2.839)*	0.063 (2.646)*
Rev	0.041 (2.452)*	0.047 (2.474)*
Ch_Rev	0.092 (1.914)	0.149 (1.980)*
Cap_Exp	0.642 (2.212)*	0.584 (2.047)*
Ch_CapExp	1.404 (1.622)	1.302* (2.297)
BI		-0.122 (-1.310)
SHR		0.120 (1.340)
KNFS		0.064 (3.603)**
PINF		0.080 (2.800)*
MD&A		-0.037 (-0.359)
IA		0.078 (3.707)**
SEI		0.030 (2.299)*
IMR		1.440 (2.014)*
Model Fit ( <i>F</i> )	8.461**	15.994**
Adj. R <sup>2</sup>	0.234	0.328
Model F Tests: Model 2 vs. Model, F = 7.01*		

\*\*, \* indicate statistical significance at the p = 0.01 and 0.05 levels, respectively (two-tailed test); T-statistics in parenthesis

**Ch\_Rev**<sub>t+1</sub>: change in revenue of firm *i* in year t+1 divided by total assets at the beginning of the accounting period; **NI**<sub>it</sub> and **NI**<sub>it-1</sub>: company *i*'s earnings before extraordinary item for fiscal year t and t-1 divided by total assets at the beginning of the accounting period; **Ch\_NI**<sub>it</sub>: The change in net income earnings before extraordinary item of firm *i* in year t divided by total assets at the beginning of the accounting period; **Rev**<sub>it</sub>: Revenues of firm *i* in year t divided by total assets at the beginning of the accounting period; **Ch\_Rev**<sub>it</sub>: The change in revenues of firm *i* in year t divided by total assets at the beginning of the accounting period; **CapExp**<sub>it</sub>: Capital expenditures of firm *i* in year t divided by total assets at the beginning of the accounting period; **Ch\_CapExp**<sub>it</sub>: The change in capital expenditures of firm *i* in year t divided by total assets at the beginning of the accounting period; **BI**<sub>it</sub>: background information; **SHR**<sub>it</sub>: summary of historical results, **KNFS**<sub>it</sub>: key non-financial statistics, **PINF**<sub>it</sub>: projected information, **MD&A**<sub>it</sub>: management discussion and analysis, **IA**<sub>it</sub>: information on intangible assets, **SEI**<sub>it</sub>: Social and environmental information.; **IMR**<sub>t</sub>: selection bias control factor.



**Table 7 : Association of Website Disclosures Categories with Future Income**

<b>Independent Variables</b>	<b>Regression without Website disclosures categories</b>	<b>Regression with Website disclosures categories</b>
Intercept	0.169 (-0.004)	0.189 (0.099)
NI	0.197 (3.238)**	.091 (2.453)*
Ch_NI	0.113 (0.762)	0.121 (0.768)
Rev	0.011 (2.075)*	0.046 (4.299)**
Ch_Rev	0.053 (2.314)*	0.026 (3.143)**
Cap_Exp	0.285 (3.348)**	0.149 (0.176)
Ch_CapExp	0.325 (1.394)	0.447 (2.522)*
BI		0.086 (0.601)
SHR		-0.065 (-0.477)
KNFS		0.047 (2.287)*
PINF		0.120 (3.812)**
MD&A		0.095 (0.532)
IA		0.186 (2.098)*
SEI		0.220 (3.455)**
IMR		1.680 (2.731)*
Model Fit ( <i>F</i> )	2.099*	3.501*
Adj. R <sup>2</sup>	0.224	0.364
Model F Tests: Model 2 vs. Model, F = 6.53*		

\*\*, \* indicate statistical significance at the p = 0.01 and 0.05 levels, respectively (two-tailed test); T-statistics in parenthesis

Ch\_NI t+1 : The change in net income before extraordinary items of firm i in year t+1 divided by total assets at the beginning of the accounting period;; NI it and NI it-1: company i's earnings before extraordinary item for fiscal year t and t-1 divided by total assets at the beginning of the accounting period; Ch\_NI it: The change in net income earnings before extraordinary item of firm i in year t divided by total assets at the beginning of the accounting period Rev it : Revenues of firm i in year t divided by total assets at the beginning of the accounting period; Ch\_Rev it : The change in revenues of firm i in year t divided by total assets at the beginning of the accounting period; CapExp it : Capital expenditures of firm i in year t divided by total assets at the beginning of the accounting period; Ch\_CapExp it : The change in capital expenditures of firm i in year t divided by total assets at the beginning of the accounting period; BI it: background information; SHR it: summary of historical results, KNFS it: key non-financial statistics, PINF it: projected information, MD&A it: management discussion and analysis, IA it:

information on intangible assets, SEI it: Social and environmental information.; IMR : selection bias control factor

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## **THE THREE DIMENSIONS OF A SUSTAINABLE MANAGEMENT ACCOUNTING SYSTEM**

During the last decade, the traditional role of management accounting systems has been criticized in terms of the identification, classification, measurement, and reporting of environmental and social information. A longitudinal case study was conducted to provide initial evidence regarding the adaptation of management accounting systems to support sustainability strategies.

### **Introduction**

Since Rio de Janeiro 1992 Earth Summit, sustainability began to be widely discussed by politicians, business leaders and NGOs, and became more relevant in the day-to-day business debate (Dyllick and Hockerts, 2002). Interestingly, during the last fifteen years several firms worldwide have been moving beyond the compliance of new environmental and social regulations because they have realized the potential benefits of incorporating sustainability issues into their corporate strategies due to the eventual competitive advantages and economic benefits linked to sustainability (DeSimone and Popoff, 1997; King and Lenox, 2001). Different Canadian reports, such as those published by Stratos and The Conference Board of Canada, recognize that sustainability is becoming a factor in Canadian business. As an example of that, in 2001 only 35% of the companies listed on the Toronto Stock Exchange (TSX) included some sustainability information in their annual reports or in a stand-alone report, but in 2005 this increased to 70% of the companies listed on the TSX Composite Index.

Although there is plenty of information about how Canadian companies are developing appropriate performance metrics and indicators for a wide range of sustainability issues, I argue that there is not clear evidence to conclude that those companies consider sustainability to be a core strategic issue, but if they do, it seems relevant to examine how they adapt their management accounting systems to support their sustainability strategies. Therefore, the purpose of this study is to provide initial evidence that will allow us to understand to what extent management accounting systems have evolved in Canadian firms to take into account environmental and social concerns. In order to achieve this objective, this exploratory study presents a conceptual framework that aims to respond the following research questions: How do Canadian firms adapt their management accounting systems (MAS) to support their sustainability strategies? How is the adaptation of MAS linked to the whole change process within a firm? It is important to mention that adaptation (also referred as change) of MAS can be analyzed from two approaches: adaptation as a process or adaptation as a difference between states or forms over time (Demers, 2007). The current exploratory research analyzes adaptation as a difference between management accounting practices, and thus the focus is on the outcomes of the adaptation process instead of the adaptation process itself.

The main contributions of this study are twofold. First, provide initial evidence regarding the adaptation of management accounting systems in firms that are following a sustainability strategy. Second, highlight the existence of a lag between sustainability polices and management accounting systems, a problematic that has not been extensively covered by the accounting literature. The remainder of this study is organized as follows. The next section presents a literature review and describes the conceptual framework proposed. The third section describes the methodology used to obtain and analyze the data collected and the fourth section presents the main findings of this exploratory research. The fifth section discusses those findings and the final section presents the main contributions of this study.

## **Literature Review**

### **Stakeholders and sustainability**

Freeman, one of the first authors proposing stakeholder theory, states that “a stakeholder in an organization is any group or individual who can affect or is affected by the achievement of the organization’s objectives” (Freeman, 1984: 46). This definition mainly suggests that firms face several stakeholders, and therefore managers should proactively address stakeholder interests by identifying which interests should be attended to and defining how to deal with them (Berman et al., 1999). According to Berman et al, there are three lenses to analyze the relationship between firms and stakeholders: normative, instrumental or empirical<sup>2</sup>. In terms of the empirical domain, the most interesting for the current study, the main concern is to know how managers actually deal with stakeholders. Berman et al. also point out the existence of two views to analyze the efficacy of stakeholder management practices, the strategic stakeholder management model and the intrinsic stakeholder commitment model. The first model proposes that managerial concerns are determined exclusively by the perceived ability to improve firm financial performance through stakeholders concern, whilst the second model emphasizes the moral commitment to treating stakeholders in a positive way.

The main focus of the current study is the strategic stakeholder management model. In this approach, firms consider stakeholders as facilitators of resources that must be managed to enhance the implementation of corporate decisions and assure firms financial performance (Berman et al., 1999). Therefore, stakeholder’s concerns are considered in the decision-making process only if they have strategic value to the firm. Doubtless, the recognition of stakeholders and their claims are the basis for corporate sustainability. As Hockerts (2001) and Dyllick and Hockerts (2002) argue, sustainable development analyzed from a corporate point of view implies that any sustainability strategy must meet the needs of a firm’s stakeholders without compromising its ability to meet the needs of future stakeholders as well. Therefore, “a sustainable enterprise is a firm that contributes to sustainable development by delivering simultaneously economic, social, and environmental benefits – the so called triple bottom line” (Elkington, 1998). These macroeconomic definitions do not provide much guidance for managers (Epstein and Roy, 2003) which explain why many businesses and scholars have tended to focus the discussion on the business case for sustainable development, which is only one of the dimensions of sustainability (Dyllick and Hockerts, 2002). The business case consists on asking how firms can enhance their economic sustainability by increasing their social and ecological efficiency. In other words, the business case requires managers to quantify the link between social and environmental strategies and financial performance (Epstein and Roy, 2003).

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<sup>2</sup> Previously, these terminologies were used by Donaldson and Preston (1995) and Quinn and Jones (1995)

There are several frameworks addressing sustainability strategies. As is shown in figure 1, Bieker (2003) proposes to classify sustainability strategies according to their strategic orientation (market or society) and strategic behavior (reactive or proactive), which imply four sustainability strategies: (1) credible or clean, that aims to tackle issues of image and reputation; (2) efficient, that seeks to improve productivity and efficiency; (3) innovative, that aims to differentiate product and services in the market; and (4) transformative or progressive, that seeks to create new markets by shifting existing institutional frameworks. Therefore, once managers identify stakeholder claims, assess the sources of competitive advantage and formulate and implement a sustainability strategy, it becomes crucial to determine what accounting systems and structures should be used to successfully implement the selected sustainability strategy, and finally link the sustainability performance to financial performance (Wisner et al., 2006).

		Strategic Orientation	
		Public	Market
Strategic Behaviour	Reactive	Credible / Clean	Efficient
	Proactive	Transformative / Progressive	Innovative

**Figure 1 – Sustainability strategies**

### **Sustainable management accounting**

A sustainable management accounting system is one that delivers simultaneously economic, environmental and social information. Specifically in this study I will extend the definition of Bennett and James (1998: 33) to emphasize that sustainable management accounting (SMA) is the generation, analysis and use of financial and non-financial information in order to optimize corporate *environmental, social, and economic performance* and to achieve sustainable business. This extended definition implies that a SMA system might mainly identify environmental and social costs, reallocate environmental and social costs, define environmental and social measures, link environmental and social measures to financial performance, and apply environmental and social accounting to capital budgeting. It is important to notice that environmental and social costs exist in traditional accounting systems but they have not been assumed to be important and thus they are hidden as overhead expenses (Bennett and James, 1998). Therefore, there are several critical questions that traditional systems have not been able to answer, such as what are the company’s environmental and social costs? How large are these costs? Where do these costs arise within the company? How can these costs be better managed? (Ditz et al., 1995) Equally important is to address whether these costs are directly creating value for the firm or only social value (Wisner et al., 2006).

The most recurrent tools studied in the environmental management accounting literature are performance measurement systems, costing systems, and capital budgeting. Firms require appropriate measurement systems to support fact-based environmental decision making otherwise managers only will use their intuitive feelings to assess their environmental performance, which can led them to poorly

informed decisions (Epstein, 1996; Epstein and Roy, 2001; Clarke and O'Neill, 2005). Henri and Journeault (2006; 2007) highlight four uses of performance measures: to monitor compliance with environmental regulation; to motivate continuous improvement; to provide data for internal decision-making; and to provide data for external reporting. In any case, there is a general consensus about the importance of providing more accurate and precise measures for the physical flows (energy, materials, waste, etc.) and their associated costs. Several authors propose that management accounting system should be employed to seek out, identify and exploit financial savings in resources usage, waste and energy emissions because that would lead to reductions in the corporations' environmental impacts (Schaltegger et al., 1996; Bennett and James, 1998; Ditz et al., 1995). One technique to evaluate the environmental impact of products and processes, as well as the opportunities for improvements, is life-cycle assessment, but that technique cannot find out the value of the environmental impacts in economic terms. Therefore, the literature suggests conducting a life-cycle cost assessment to evaluate the monetary impact of products or processes. Life-cycle costing seeks to identify all the environmental costs associated with a product, process, or activity through all the stages of its life (Epstein, 1996) and thus adding a monetary component to the life-cycle assessment analysis. Another technique suggested by the literature is activity based costing (ABC), which implies to allocate environmental costs directly to the activities and products that cause the costs (Schaltegger and Muller, 1998). The main benefit of this technique is that environmental costs are not accounted as overheads and thus managers will be able to assess the real cost of its products.

Although the previous considerations are important in sustainable management accounting systems, there is a key element missing in this analysis, which is the link between the system and the sustainability strategy. Wisner et al (2006) emphasize that managers need to understand what management control processes and actions best support the implementation of an environmental and social strategy, which implicitly means to recognize that sustainable management accounting systems are contingent to the strategy of the firm and to the complexity of its environmental challenges (Ditz et al, 1995). Therefore, the extent to which a firm adapts its management accounting systems will depend on the need for environmental and social performance information that is dictated by the nature of their operations and the complexity of its sustainability strategy (Clarke and O'Neill, 2005). According to contingency theory, management accounting systems should be designed or adapted specifically to suit the strategy of firms and in this particular case to their sustainability strategies (Simons, 1987; Chenhall, 2003). This means that the attributes of the system should be adapted according to the context of its use. Simons found evidence that firms following different strategies employ their accounting control systems in a different way and change some attributes based on the strategy being followed. Even though that study was designed to determine the nature and extent of differences in the control systems of firms which follow different business strategies, I propose to extend this design to determine the nature and extent of differences in sustainable management accounting systems of firms following different sustainability strategies.

The conceptual framework proposed in this exploratory study (see figure 2) posits an active role of stakeholders in the process of change. Stakeholders have several concerns about sustainability and voice those concerns to several firms. The firm that reacts to stakeholder's pressures is mainly the one that perceives that those concerns could have a strategic value for the firm, but it is also possible to observe firms reacting to these pressures because the firm has as a moral commitment with the society (*the right thing to do*). The first group of firms should formulate and implement a sustainability strategy that responds to stakeholders' concerns (credible, efficient, innovative, or transformative), which under contingency theory implies an adaptation of the current management accounting systems (MAS) to support decision-making, environmental performance assessment and accountability (Environment Canada, 1997). The adapted version of MAS is called "Sustainable Management Accounting Systems",





The adapted MAS should be able to provide data to determine the company's environmental and social costs, how large these costs are, and where they arise within the company. It is important to notice that the adaptation of management accounting systems becomes an iterative process driven by the changes in the strategy of the firm, meaning that the degree of adaptation of MAS varies as the firm changes its sustainability strategy. For instance, under an "efficient strategy" the main focus should be in capital budgeting (recognizing cost savings) and performance measurement (monetary and physical metrics); however, if the firm decides to implement an "innovative strategy", an important change should be observed in the costing systems because it will be necessary to get a better estimation of the cost of the new environmentally-friendly products as well as the specific costs related to new production designs.

## Methodology

The case study method (Yin, 1994) was utilized in this exploratory research. One of the main advantages of conducting a case study is that it provides a rich understanding of real-world phenomena through direct contact with the organization (Merchant and Van der Stede, 2006). The real world phenomenon in this research is the increasing interest of North American firms on implementing sustainability strategies, which should have an impact on the way companies manage their businesses. Doubtless, one of those changes might occur in their management accounting systems (performance measurement, costing, etc.). Because this field research involves the study of accounting practices in their natural setting, it facilitates the generation of relevant theory (Bennis and O'Toole, 2005 cited by Merchant and Van der Stede, 2006) and its exploratory character is especially effective for building theory or refining existing theories. Moreover, a single longitudinal case allows examine the whole adaptation process instead of focusing on several short cases. In that sense, Interface Inc. and all its subsidiaries are the adequate sites to observe the adaptation process, given that their "sustainability journey" began in 1994 and it still continues until the company and its subsidiaries reach their "mission zero" goal set for the year 2020. Furthermore, there is not strong evidence in the literature showing firms adapting their management accounting systems to support their sustainability strategies, so it is likely that InterfaceFLOR represents a leading case in Canada, which according to Yin (2003) is a justification for conducting a single case study. Its uniqueness is also reflected in the way its owner has dealt with Interface's new strategy, which has called the attention of the press and the business community.

Three semi-structured interviews were the primary source of information of this exploratory study, which were conducted by phone during August 2007. These interviews were triangulated with data collected from annual reports, press articles, sustainability reports, Interface's web sites ([www.interfaceinc.com](http://www.interfaceinc.com); [www.interfaceflor.com](http://www.interfaceflor.com); and [www.interfacesustainability.com](http://www.interfacesustainability.com)), books and journal articles that have examined Interface's sustainability strategies and initiatives (Anderson, 1998; Johansen, 1998; DuBose, 2000; Anderson, 2004; Stubbs and Cocklin, 2007). Regarding the interviews, each one lasted in average 40 minutes and they were recorded and transcribed (appendix 1 presents the interview guide). Two interviewees are part of the management team of InterfaceFLOR Canada and the third interviewee works for the Sustainable Strategies Team of Interface, Inc. at Atlanta. This team is responsible for providing technical and logistical assistance to all business units in the collective efforts to promote and implement sustainability. Once the interviews were transcribed, they were coded using Atlas.ti software. Two coding procedures were utilized in that phase: definition of codes based on the conceptual framework (i.e. predetermined codes) and inclusion of free codes as the data suggest<sup>3</sup>. In other words, the conceptual framework was used to analyze the data collected during the interview but "free"

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<sup>3</sup> These codes procedures are not new in management accounting. See Malina and Selto (2001) as an example.

codes were added in the analysis when the data suggested doing it (Miles and Huberman, 1994). According to Miles and Huberman, the main advantage of this hybrid approach is that it acknowledges theoretical guidance and permits empirical flexibility or theory revision. Therefore, instead of proposing alternative interpretations of the same event (the adaptation of the MAS) based on prior theoretical premises, the study compares the “deductive conceptual framework” with a modified “grounded” framework. This pattern-matching approach is also suggested by Yin (2003) as one of the most desirable techniques for case study analysis. In order to find associations among these codes, several queries were conducted with the software to observe whether one coded quotation enclosed, was enclosed, overlapped or were overlapped by a coded quotation of other type.

Given the purpose of this exploratory study, a visual mapping and a temporal bracketing strategy were considered the most appropriate to analyze the simultaneous representation of several dimensions, and thus facilitating the analysis of precedence, and parallel processes. Most importantly is the fact that the decomposition of data into successive periods allows to examine how actions of one period lead to changes that will affect the action of subsequent periods (Langley, 1999). According to prior studies, the adaptation of MAS to support sustainability strategies is affected by stakeholders’ pressures (precedent process), and thus before studying the adaptation process itself it is recommended to examine that precedent process and show its impact on the MAS adaptation process. Moreover, the adaptation of MAS could imply the adaptation of other management systems, and thus it is important to map those processes to build a framework that describes how the adaptation of MAS is linked to the other changes observed in the firm.

#### *Quality and limitations of chosen methods*

Regarding the quality and limitation of this method, Yin (2003) points out that there are four relevant quality tests for case studies: construct validity, internal validity, external validity, and reliability. In terms of construct validity, this study utilizes multiple sources of evidence in the data collection process, including semi-structured interviews, the use of internal reports, and the examination of sustainability reports. Moreover, in order to minimize the subjectivity in the process of operationalizing the main concept of this study, the adaptation of MAS, the collection of data and analysis is focus on the changes that are only related to the implementation of the specific sustainability strategy and not to other changes (for instance a change required by a new environmental regulation). In terms of internal validity, it is relevant to establish “credible” causal relationships. The study considers that the use of a temporal bracketing strategy as well as the pattern-matching approach, which were explained in the previous paragraphs, are helpful to achieve that objective because the “theoretical causal relationships” will be complemented with causal relationships obtained from the setting. The simple case study approach does not allow a generalization of the findings, which will only occur once multiple case studies could be conducted, in different contexts (industry, region, size, etc) and using the same protocol designed for this single case study. Therefore, the replication logic strategy is the one that will provide in the future the “expected” generalization of the results obtained in this research. Finally, in terms of reliability, the use of the same protocol is the basis to achieve this goal; therefore, the interview guide will be an important document to keep in the database. However, it is important to notice that although the existence of this guide aims to limit the interview in terms of the number of themes covered, new “codes” could emerge during the interviews and that will require researchers to explore them immediately in order to get more information about these emergent ideas, thus modifying the original protocol.

## Exploratory findings

The longitudinal case study was conducted at InterfaceFLOR Commercial Canada, the Canadian division of Interface Inc., which was founded by Ray Anderson in 1973 with the purpose to produce the first free-lay carpet tiles in North America. Nowadays, Interface Inc. is the world leader in the design, production and sales of modular carpets and a leading manufacturer and marketer of broadloom carpet, with a global market share of 35% in the carpet tile segment, facilities in four continents, and annual sales over \$1 billion. Its Canadian division, InterfaceFLOR Commercial Canada is located at Belleville, Ontario. This division reported sales over \$44 million and a workforce of 80 employees during the year 2006. Moreover, it has been recognized as one of the leading subsidiaries regarding sustainability, which has been evidenced by the early implementation of ISO 14001 and ISO 9000 as well as other initiatives.

Sustainability became a strategic goal at Interface in 1994 after its main shareholder, Ray Anderson, was challenged for a small group of customers to explain the role of the company in reducing the environmental impact of its operations worldwide. At that time, the company did not have a vision, except “*obey the law, comply, comply, comply*” (Anderson, 1998; page 39). However, in order to give a better answer, Anderson started reading about environmental issues, and specifically Paul Hawken’s “The Ecology of Commerce” book was the answer that drove his conversion to sustainability (DuBose, 2000; Dean, 2007). As Anderson highlights in his book:

*“I read it, and it changed my life. It hit me right between the eyes. It was an epiphany. I wasn't halfway through it before I had the vision I was looking for, not only for that speech but for my company, and a powerful sense of urgency to do something to begin to correct the mistakes of the first industrial revolution”.*

In several opportunities, Ray Anderson has recognized that Hawken’s book was “a spear in the chest” because he saw himself as a plunderer of earth that was destroying the biosphere. So immediately he encouraged his employees and himself to convert Interface in a restorative enterprise, i.e. a company that in its operations takes nothing out from the earth that cannot be recycled or quickly regenerated, and that does no harm the biosphere. Therefore, at Interface the decision of becoming a sustainable company was not a reaction to stakeholders’ pressures as the conceptual framework proposes but a process of reflection about the footprint that Interface’s operations produced. The role of stakeholders was to challenge the company to analyze its business model but they have not been the drivers of change. As one of the managers stated:

*“If you look at stakeholders, first we are pushing on our workforce, it is not the workforce pushing on us, we are pushing on them, so it is like the reverse. And we are pushing on our suppliers to give us more sustainable products, raw materials....and we are pushing on the community.”*

A second manager also mentioned the interaction with its stakeholders:

*“Our suppliers, they are part of our stakeholders too, they understand our position.....we are asking them, well ok we want your greenest, we want your most environmentally friendly product to use.”*

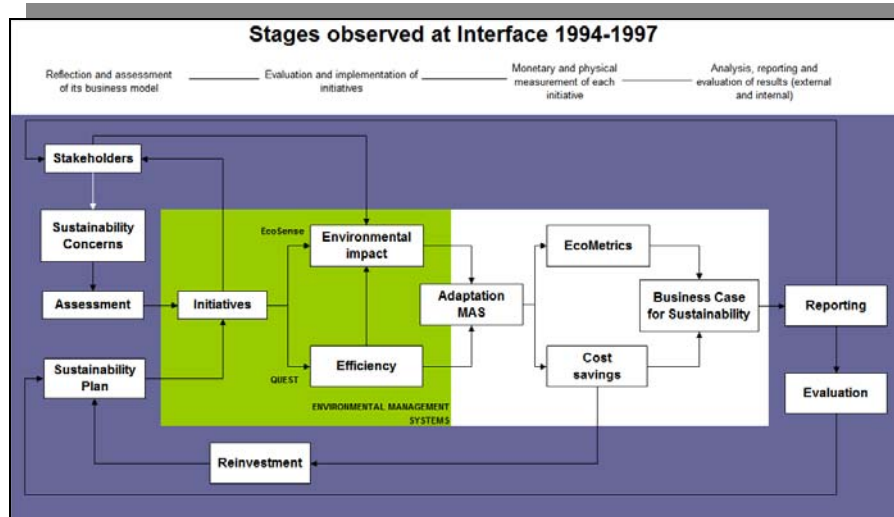
Therefore, the stakeholder orientation model (Berman et al, 1999) at Interface is closer to a commitment model rather than strategic management model. In effect, the managerial approach observed was grounded by a moral obligation to stakeholders (even though they didn't exert a pressure) but at the same time Interface sought sources of competitive advantages not only to finance its commitment but also to become more profitable. Once environmental concerns became an issue at Interface, an assessment was conducted to determine how much solid, water and energy was wasted through its operations. After conducting this assessment, two main initiatives took place: QUEST (quality utilizing employee suggestions and teamwork) and EcoSense. Through these initiatives Interface sought not only to reduce its environmental impact but also to be more efficient by reducing waste. According to one of the managers, this was the strategy (eco-efficiency) to get the support of the board. The deal was to use all the saving coming from waste reduction to finance the EcoSense initiative, which is described as a roadmap for employees and all the people involved with Interface to help the company to become more sustainable.

It is interesting to notice that the company does not make explicit its sustainability strategy but it is reflected through its initiatives. In this phase the initiatives are focus on efficiency and reduction of its environmental impact, which clearly reflect an eco-efficiency strategy. In order to design, implement, and evaluate the progress of these initiatives, Interface required to implement several environmental management practices such as life-cycle assessment, ISO 14001 and ISO9001. However, those tools are not enough to show the impact of each initiative in the bottom line of Interface. Therefore, it was necessary to adapt the management accounting systems to prove the business case for sustainability. The main change took place in performance measurement, through EcoMetrics, and small changes took place in its costing system and capital budgeting. According to one of the managers at Interface, *“anything in Interface needs to be audited. If it is not auditable, it doesn't exist....every time that you say savings in the energy, savings in the ecology, there is always a connotation of savings that is worth a dollar.”*

The same manager highlighted the importance of building a business case for sustainability. At Interface, people know it is not enough to look at sustainability just from an ecological view, and thus they also have to look at it from a financial perspective because as they say this is the only way *“you can sell this concept to other businesses and to its shareholders”*. In order to sell the concept, managers emphasize that it is primordial to report the results internally, to evaluate the progress of each initiative and the savings achieved, but also externally to show stakeholders the improvements of the company in terms of its footprint and savings. Since 2001 Interface Inc. publishes an online sustainability report that explains all the initiatives in place as well as the main results achieved during the last twelve years, globally and by facilities. As one of the managers highlighted:

*“It [the EcoSense report] gives people a reason to talk about it again, and the most consistent thing that any company can do is to make sure that when they develop a program they also develop a scorecard associated with.....you have heard, tell me what you are going to measure and I will tell you what I am going to manage. So, this is what we are measuring and it is very important that you communicate that score to everyone.”*

Based on these empirical data, the following framework is proposed, which summarizes all the stages of the change process observed at Interface from 1994 to 1997, and the impact of those changes in its management accounting systems:

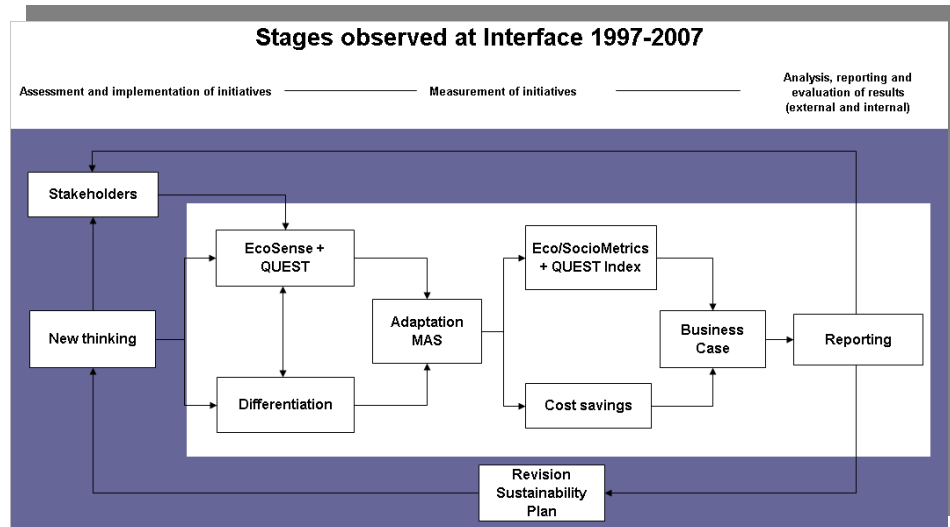


**Figure 4 – The first phase at Interface (1994-1997)**

Interface realized that following an eco-efficiency strategy was not enough to achieve sustainability. One of its managers stated,

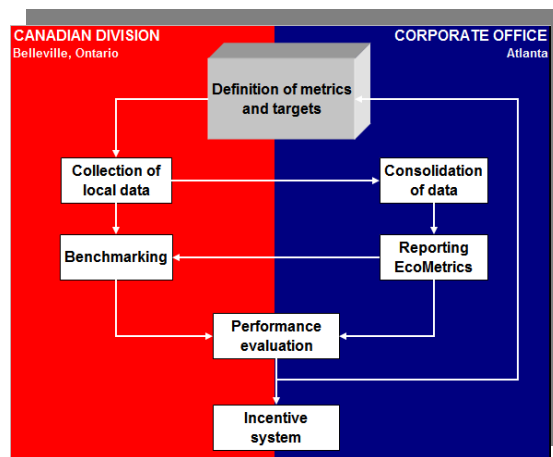
*“The most important thing is not so much the way we are doing this. The fact that we incorporated QUEST and the fact we have reduced our emissions is one aspect. More important is how we think. The big change was to think differently. If we think as we always thought before, we would not be where we are today.”*

Therefore, a second phase of Interface’s change process was driven by this new way of thinking, which in turn was driven by the result of the previous phase jointly with the decision of merging the two main initiatives (QUEST and EcoSense) in February 1996. After the merger, Interface formed 18 teams with representatives from all its businesses worldwide, which according to Ray Anderson positively changed its corporate culture because it forced them to think differently by having access to different perspectives regarding new opportunities (Anderson, 1998). The differentiation strategy has been materialized through the design of new products and services that are more environmentally friendly but also less costly for the company. This new strategy should have been followed by an adaptation of the MAS to evaluate the monetary impact of producing and selling innovative products such as Terratex fabrics, Entropy and TacTiles in the bottom line, however until now those changes have not been introduced. Interface is aware of that necessity and the plan is to adapt the MAS during the next year. The change process that took place during this second phase can be summarized in the following figure:



**Figure 5 – The second stage at Interface (1997 - current)**

Nevertheless, some adaptations of its management accounting systems took place at Interface. For instance, the identification of environmental costs was conducted a decade ago. As a second step, the company integrated those environmental costs in its performance measurement system (EcoMetrics), capital budgeting and costing system. EcoMetrics is defined by one of its managers as “Interface’s metabolism” because it measures how much the company take in, in raw materials and energy, and what comes out in the form of products and waste (Cortese, 2006).



**Figure 6 – The EcoMetrics measurement system**

As presented in figure 6, the first step in the EcoMetrics measurement system was to identify the most appropriated metrics to assess the progress of its initiatives. That phase was conducted jointly by the Canadian division and the corporate office. Once the metrics and their targets are defined, each facility collects its local data and sends them to corporate office to be consolidated and reported globally. The EcoSense report is published internally four times per year and externally once per year. All the information is shared among the subsidiaries in order to benchmark the performance of these facilities

and reward the most successful. However, all the employees are part of the incentive system that rewards the progress of their local metrics (DuBose, 2000), therefore EcoMetrics is also utilized as a performance evaluation tool. The final step is an annual evaluation of each metric to assure consistency with its initiatives, thus EcoMetrics can be considered as a dynamic performance measurement system because once this revision process is finished some metrics are added and other are taken out.

The adaptation has been also observed in its costing system. The change began by identifying environmental costs and classifying them mainly as regulatory or voluntary. However, the company does not use an allocation method (such as ABC costing) to assign environmental costs by activity or product. What Interface has been doing occasionally is to conduct life-cycle cost analysis in some of its products, which allows quantifying in dollars the environmental impact of its products. It is important to mention that this life-cycle cost assessment is still not a regular practice as it is its life-cycle assessment that evaluates the environmental impact of all the products at Interface. However, one interesting result related to the use of life-cycle cost analysis occurred in its recycling program. In 1996, Interface sent used carpet off to a contractor, which recycled it into sheets of backing material and shipped it back. Few years later, Interface conducted a life-cycle cost of that program and found that the recycled product had a greater environmental impact than carpet made of virgin materials, so Interface decided to bring its recycling efforts in-house (Cortese, 2006), which also had a positive impact in the bottom line.

Proving the business case for sustainability has been always present at Interface. In effect, in several opportunities Ray Anderson has highlighted the importance of making the business case. According to Mr. Anderson:

*“I always make the business case for sustainability ... Our costs are down, not up. Our products are the best they have ever been. Our people are motivated by a shared higher purpose —esprit de corps to die for. And the goodwill in the marketplace — it’s just been astonishing.”*

## **Discussion**

The main purpose of this exploratory case study is to illustrate to what extent Canadian firms adapt their management accounting systems to support their sustainability strategies. Clearly, the change process at Interface can be separated in two phases, as is shown in figure 6. The first phase began in 1994 with a sustainability vision centered mainly on the environment and thus a sustainability strategy focus on eco-efficiency. In 1997 the company decided to go further in its sustainability vision and implemented a differentiation strategy that is still in practice. However, Interface still believes it is possible to go further and become a restorative firm by the year 2020. In order to achieve that goal, the company needs to implement a transformation strategy to create new markets and institutionalize some practices.

	From 1973 to 1994	1994 - 1997	1997 - currently	In 2020
<b>Sustainability Vision</b>	Traditional Business Model	Environment	New thinking	Restorative firm
<b>Sustainability Strategy</b>	Law compliance	Eco-efficiency	Differentiation	Transformation
<b>Management Accounting Systems</b>	Traditional Management Accounting Systems	Environmental Management Accounting System	Environmental Management Accounting System	Sustainable Management Accounting System

**Figure 6 – Interface’s sustainability journey**

Doubtless, the strategic changes at Interface have been followed by changes in its management accounting systems; however, the evolution has not been the same. In terms of the vision and sustainability strategies, Interface has been very pro-active as well as radical in its environmental initiatives but that radicalism has not been observed in the adaptations of its management accounting systems. During these twelve years, the main transformation occurred in its performance measurement systems (EcoMetrics) and moderately in its cost systems; however the company is still far of having a full-cost accounting system, i.e. an accounting system that considers not only internal costs but also externalities (Bennett and James, 1998). Moreover, although Interface placed the social dimension of sustainability at the core of its sustainability vision in the year 2000, this is still not fully incorporated neither in its business model nor in its management accounting practices (Stubbs and Cocklin, 2007). Therefore, there is no evidence to conclude that Interface’s environmental management accounting systems have become sustainable management accounting systems. That situation should be expected when the company achieves a transformation (restorative) strategy by the year 2020.

As previously stated, Interface has implemented two sustainability strategies: eco-efficiency and differentiation. Each strategy required the adaptation of its management accounting systems, being first the inclusion of physical and monetary metrics in its performance measurement systems and later the sporadic use of life-cycle cost analysis to assess the dollar value of its initiatives. The implementation of a differentiation strategy also required some changes in its environmental management accounting systems but those changes so far have not been introduced. However, it is interesting to mention that all the innovations in its production processes and sales, as well as in its environmental management systems, have continued year by year since 1994 even when the financial situation of the company was affected by an industry crisis during the years 2000 to 2004. It seems that the management accounting systems were useful to make a distinction between the negative impact generated by external factors and the costs and savings generated by sustainability initiatives.

As mentioned in the environmental accounting literature, the adaptation of MAS requires the involvement of different areas of the company such as accounting, operations, environmental management and other business functions (Bennett and James, 1998). However, the changes should be led by management accountants. At Interface, the accounting function has been mainly involved in the evaluation of the QUEST initiative but not in EcoMetrics, which is led by operations and the corporate office. The accounting area provides information that is consolidated by the sustainability strategies team but it does not include any EcoMetrics in its “traditional” internal reporting. As mentioned by the controller of InterfaceFLOR Commercial Canada, “we just include in the internal reporting the results (savings) coming from the QUEST initiative...managers receive from operations the EcoMetrics report”.



## Conclusion

One of the main contributions of the present exploratory study is to provide some initial evidence regarding the adaptation of management accounting systems to support sustainability strategies in Canadian firms. As contingency theory proposes, management accounting systems are contingent to the strategy of the firm and thus if it changes then the management accounting systems should be adapted to support this new strategy. In this particular case study, the adoption of sustainability strategies implied the adaptation of MAS, especially its performance measurement systems, but those adaptations have not been aligned with the level of radicalism observed in the implementation of sustainability strategies (eco-efficiency and differentiation). Interface has been able to identify several of its environmental costs (regulatory and voluntary) but those are still hidden as overhead costs and thus the real cost for each product is still unknown at Interface. Moreover, the company has formally implemented life-cycle assessment for all its products but that formality is still not in place for conducting life-cycle costing analysis, meaning that the company has assessed the environmental impact of its processes but many of those assessments have not been expressed in monetary terms.

It is relevant to emphasize that during the last twelve years the company has been focused on developing EcoMetrics and SocioMetrics to show the improvement of Interface initiatives in several fronts: gas emission, water consumption, waste, energy consumption, etc. The company has been also focused on assessing the amount of savings generated by QUEST, because those savings jointly with the reduction of its environmental impact have supported the business case for sustainability. However, Interface is still far away from having a sustainable management accounting system that provides manager the necessary information to generate, analyze and optimize environmental, social, and economic performance.

A second contribution is related to the conceptual framework proposed, in which the adaptation of management accounting systems becomes an iterative process driven by the changes in the strategy of the firm. Moreover, the grounded conceptual framework based on the evidence collected at Interface is useful for getting a better understanding of the complete process of change behind the implementation of sustainability strategies. As mentioned in the accounting literature, prior studies have been mainly focus on describing the state of the implementation of new tools rather than analyzing their effectiveness or evaluating the drivers of change. In that sense, this exploratory case study provides some initial evidences for theory building.

## Appendix 1 - Interview guide

### Sustainable development and Stakeholders

1. How has sustainable development been operationalized in the corporate strategy?
2. What are the main differences between the 1994 commitment and the 2006 Mission Zero?
3. How has InterfaceFLOR Canada been involved in the sustainability journey?
4. How stakeholders' concerns are considered in the decision-making process?
5. Which mechanisms does Interface utilize to communicate with its stakeholders?

### Sustainability strategies and management systems

6. How has Interface's sustainability strategy evolved during the last decade?
7. What have been the main factors influencing Interface in adopting the current sustainability strategy?
8. What are the main environmental and social policies/practices that Interface has adopted?
9. How does the firm identify the impacts and potential environmental and social problems?

### Management Accounting Systems

10. Which has been the role of accounting in the implementation of sustainable initiatives?
11. What have been the main changes in the management accounting systems since 1994?
12. How much of the information required for decision-making that is related to environmental or social issues is provided by the accounting function?
13. To what extent is the accounting function involved in the analysis and reporting of EcoMetrics and SocioMetrics?
14. To what extent is Interface able to answer what are its environmental and social costs, how large are these costs, and where do these costs arise within the company?
15. What have been the main challenges in the process of building the business case for sustainability?

### Main challenges

16. What are the key factors necessary to become a sustainable company?
17. What are the key challenges that your company may face in the next 10 – 15 years?
18. Is there anything else you would like to add?

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### **AUDITOR-CLIENT DISAGREEMENTS: CAUSES AND CONSEQUENCES**

Society relies on financial statement auditors to uphold financial reporting reliability. This reality sometimes results in disagreements between auditors and client management. In this research, we examine disagreements between these two parties, the outcomes of those disagreement, and impacts on the relationship between the auditor and client management.

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**INFORMATION UNCERTAINTY, CORPORATE DISCLOSURE  
AND STOCK RETURN VOLATILITY**

We investigate the cost of improved disclosure in the context of information uncertainty. We find disclosure degree of uncertain information is positively associated with stock return volatility. Evidence also suggests that drug pipeline maturity and the nature of disclosed news differentiate the observed association. Firms with high information uncertainty face a dilemma. While no or less information disclosure can lead to high information asymmetry, more disclosure of uncertain information can be associated with excess stock return volatility. The prior literature largely suggests that more disclosure is a good thing to do. This study shows that such claim may not be valid under the circumstance of high information uncertainty.

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**BUSINESS MODELING TO IMPROVE AUDITOR RISK ASSESSMENT:  
AN INVESTIGATION OF ALTERNATIVE REPRESENTATIONS**

This study investigates the effectiveness of alternative methods for documenting business models for the purpose of performing an audit risk assessment. We consider textual/tabular versus diagrammatic/graphical representations of the relationship between business model components such as environmental factors, strategic goals, internal processes, and resources and financial statement accounts.

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**CASE STUDIES OF ABC ADOPTION IN HOSPITALS: A COMPARISON ACROSS CANADA  
AND IRELAND**

Despite widespread research on activity based costing and activity-based management within the context of health sector reforms, little cross-national analyses have been performed. This paper is a comparative study of the adoption of activity based costing in Irish and Canadian hospitals.



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**BOARD QUALITY AND EXECUTIVE COMPENSATION DISCLOSURE TRANSPARENCY:  
CANADIAN EVIDENCE**

This paper focuses on the relationship between board of directors' quality and executive compensation disclosure transparency in Canada. We find that firms with effective boards disclose more transparent executive compensation related information. Furthermore, this study documents a positive (negative) relation between firm size, investment opportunities (CEO total pay) and compensation disclosure quality.

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**AUDIT COMMITTEE FINANCIAL EXPERTISE  
AND MISAPPROPRIATION OF ASSETS**

Our study is most closely related to concurrent studies by Mustafa and Meier (2006) and Chapple et al. (2007) that examine the relation between the incidence of misappropriation of assets and the effectiveness of the audit committee (AC). While both studies draw attention to independence of AC members, there is no direct empirical evidence to support or to refute that financial expertise has an impact on misappropriation of assets. This study is the first that tests the association between the two types of financial expertise (accounting and non-accounting financial expertise) and the misappropriation of assets.

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### **CREDIBILITY AND TSX STOCK REPURCHASE ANNOUNCEMENTS**

This paper examines the market reaction to TSX stock repurchase announcements. The findings indicate that TSX stock repurchase announcements result in a significant market reaction and provide mixed support for the TSX requirements to disclose the reason(s) for a stock repurchase program and to report actual share repurchases on a timely basis.

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## **ETHICAL ATTITUDES OF BUSINESS STUDENTS TOWARDS EARNINGS MANAGEMENT**

This paper examines the attitudes of business students towards earnings management practices. A questionnaire was used to identify students' perceptions of how ethical various earnings management practices are. The questionnaire was designed to test for several attributes to ascertain which attribute or combination of attributes would be perceived as unethical accounting practice or technique. Our results show some evidence that attitude towards earnings practices were affected by the type and purpose or intent of earnings management.

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**LA PERTINENCE DES ÉLÉMENTS D'INFORMATION RELATIFS AUX ROAA:  
UNE ÉTUDE CANADIENNE**

La présente étude a pour objectif d'évaluer la pertinence des différentes modalités de présentation et/ou de comptabilisation des éléments d'information relatifs au régime d'options d'achat d'actions (ROAA). Les résultats de l'étude tendent à démontrer que certains éléments d'information présentés par voie de notes sont pertinents pour les investisseurs alors que la constatation d'une charge dans les états financiers semble l'être beaucoup moins.

**RELATIONSHIP BETWEEN BALANCED SCORE-CARD AND KNOWLEDGE  
MANAGEMENT: A CASE STUDY**

This study investigates the use of Balanced Score-card in Knowledge Management (KM) with a reference to four different organizations in a developing country. The research results anticipate the perceived link between Balanced Score-card (BSC) and KM, i.e., BSC is not only useful for measuring multidimensional performance but also useful for management to improve and measure KM in contemporary organizations.

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**TEACHING DOUBLE-ENTRY ACCOUNTING:  
PROBLEMS, EFFECTS, AND POSSIBLE RESPONSES**

This paper presents the case for reinforcement of the basic accounting skill of double-entry accounting. It describes a case study around the development of courses that enhance the process of student's learning double entry accounting by the use of software in the development of a "business" simulation course.

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**HOW DO BANKS MEASURE PERFORMANCE?  
A CASE STUDY WITHIN AGENCY THEORETICAL PERSPECTIVE**

This multiple case study examines Performance Measurement (PM) practices in Omani and US banks within agency theoretical framework. Research results anticipate the higher effect of principal-agent relationship on PM practices in developed country/USA than a developing country, though the PM practices is found similar in both developed and developing countries, and the implementation and integration of technology in PM is seemingly (higher in Oman than USA) a new phenomenon in banks.