

The Relevance of XBRL Voluntary Disclosure for Stock Markets: The Role of Corporate Governance

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Abstract

The aim of this paper is to investigate the relevance of voluntary disclosures in XBRL files (eXtensible Business Reporting Language) for stock market participants considering the quality of corporate governance. Results are the following. It appears that XBRL extensions attract financial analysts. Good corporate governance is positively associated with voluntary XBRL extensions. We observe that XBRL extensions enhance the positive relationship between GAAP earnings and stock price. However, this positive association is reduced for firms with a good governance, suggesting a substitution effect between XBRL extensions and corporate governance. Finally, it also appears that XBRL extensions would strategically be related to earnings quality. This research highlights the importance to consider corporate governance when assessing the relevance of XBRL disclosures for stock market participants.

Key words: Financial analysts, Corporate governance, Value relevance, Voluntary disclosure, XBRL

1. Introduction

XBRL (eXtensible Business Reporting Language) is a freely available and global language for exchanging business information, mainly financial statements. XBRL taxonomy fixed by the regulator (e.g. Securities and Exchange Commission) provides an identifying tag for each individual item of data, whether numeric or textual. This tag is computer readable and allows the information to be used interactively.

Each year, accounting standard setters publish or update the reference taxonomy for their accounting standards. The FASB publishes XBRL taxonomy for the U.S. GAAP (Generally Accepted Accounting Principles) that supersedes SEC taxonomy (with over 15,000 unique tags), while the IFRS Foundation publishes taxonomy for the IFRS and so on. Filers can also find other taxonomies for more specific and accurate purposes (for a country, an industry, mutual funds, credit rating agencies, etc.), which can be used along the reference taxonomy. But, and this is very important, an

essential feature of XBRL is the possibility for the filer to create new tags (and a new custom taxonomy at the same time). The new tags are called “extensions”. Filers can create as many extensions as they want if they believe that these voluntary new tags are relevant to describe their particular situation. The aim of this paper is to investigate the determinants and value relevance of these extensions for market participants.

Studies on the incidence of XBRL for market participants are numerous but little is known about the mechanisms underlying the real impact of taxonomy extensions. Similarly, our study is the first to focus on the link between extensions and corporate governance mechanisms. Prior research shows that the impact of XBRL adoption for market participants is important but the great majority of them considers XBRL implementation as a uniform process (i.e. adoption or not). However, this approach does not allow assessing how investors perceive information published by filers using XBRL’s extensions. Therefore, these studies rarely take into account the possibility of completing the reference XBRL taxonomy by extension tags voluntarily released when an item cannot be properly represented by an existing tag. Our research investigates the nature and the importance of taxonomy’s extensions and argues that this practice is an element of a voluntary disclosure strategy. We assess how voluntary disclosures in XBRL format affect the value relevance of GAAP earnings considering the quality of corporate governance.

The central concern is about the flexibility associated with the taxonomy’s extensions. XBRL’s extensions can facilitate better reporting and reduce information asymmetry but extensive use of taxonomy extensions can also produce uncertainty related to financial statement quality.

There are two opposite views about the taxonomy’s extensions impact on stock markets. Critics argue that extensions increase the uncertainty of financial information and information asymmetry between filers and market participants. For them, extensions may require a manual analysis of the meaning of an extended item and this process can reduce the speed and accuracy of financial analysis. Critics also argue that, even properly used, extensions make computer comparisons difficult because each element of the extension must be interpreted by the user (see Debreceeny et al., 2011). Financial information will be harder for investors to analyze because extensions can threaten comparability and reliability of the XBRL-based disclosures (Boritz and No, 2005). Furthermore, managers may abuse the reporting discretion permitted under the XBRL to manipulate extensions for private objectives.

Supporters of taxonomy’s extensions, such as SEC and IFRS foundation argue that extensions improve reporting transparency and create a better information environment between filers, regulators and investors. For SEC and IFRS foundation the use of extensions is consistent with reporting flexibility and suggests that such flexibility would facilitate financial analysis with better information between firms and outsiders, including investors (IFRS Foundation, 2015).

With a better reporting flexibility, managers can use extensions to communicate information that would otherwise be missing or poorly reflected in the mandated taxonomy. The use of extensions avoids loss of information and improves the quality of financial reporting for investors and financial markets (Boritz and No, 2009). Debre-

ceny et al. (2011) argue that the XBRL extensions, when employed properly, add value for stock market's participants.

In the current study, we aim to assess the impact of these extensions on attracting financial analysts and we highlight how voluntary disclosures in XBRL format affect the value relevance of GAAP earnings considering the quality of corporate governance. More specifically, our research investigates the nature and the importance of taxonomy's extensions and argues that this practice is part of a voluntary disclosure strategy.

Our sample comprises Canadian firms, some of which are cross-listed to a U.S. stock exchange and using U.S. GAAP XBRL taxonomy. Foreign companies that use International Financial Reporting Standards (IFRS) are expected to submit their financial statements to the SEC using XBRL once the IFRS taxonomy has been accepted by the SEC. By the meantime, Canadian companies cross-listed to the U.S. are not yet required to comply with XBRL unless they report under US-GAAP.

Results are as follows. It appears that XBRL extensions attract financial analysts. Good corporate governance is positively associated with voluntary XBRL extensions. We observe that XBRL extensions enhance the positive relationship between GAAP earnings and stock price. However, this positive association is reduced for firms with a good governance, suggesting a substitution effect between XBRL extensions and corporate governance. Finally, it also appears that XBRL extensions would strategically be related to earnings quality. This research highlights the importance to consider corporate governance when assessing the relevance of XBRL disclosures for stock market participants.

The paper is organized as follows: Section 2 presents the framework and research hypotheses. Section 3 presents the methodology. The results follow in Section 4 and the last section provides a conclusion and a discussion of the potential results' implications.

2. Framework

2.1 XBRL disclosure: A literature review

XBRL is a language for the electronic communication of business and financial data around the world. It permits computer-automated acquisition and representation of information within financial reports (Blankespoor, Miller and White, 2014). The introduction of XBRL tags enables automated processing of business information by computer software, cutting out laborious and costly processes of manual re-entry and comparison (Alles and Piechocki, 2012).

Investors, financial analysts, financial institutions and regulators, can receive and analyze data rapidly and efficiently when the data is in XBRL format. Moreover, XBRL increases the speed of reporting financial data and reduces the risk of error by checking information automatically (Liu et al., 2014). With XBRL files, financial analysts can easily incorporate the information when performing forecasts. Hence,

they can incorporate more data into their analyses and follow more firms (Baldwin and Trinkle, 2011).

XBRL can disaggregate and reformat data for each specific user. It has the potential to liberate the substance of financial data over its form (Alles and Piechocki, 2012). It is also expected to improve the transparency and the quality of information (Yoon et al., 2011; Kim et al., 2012; Wang and Seng 2014; Yen and Wang, 2015). XBRL is also believed to be crucial in democratizing capital markets by leveling the playing field for all investors (Debreceeny et al., 2005).

Data is available in a less costly and timelier fashion. Once the setup costs have been incurred, the costs of processing the data in XBRL filings should be greatly reduced (Efendi, Park and Smith, 2014). XBRL improves the ability of firms to provide real-time data by eliminating the need to rekey data, thus improving the speed of data acquisition (Debreceeny and Gray, 2001). With XBRL, it is also possible to extract both financial and corporate governance indicators, when the information is presented in XBRL format (Li, Liang, Lin and Chen, 2015).

Prior research on the impact and effectiveness of XBRL documents some significant effects of XBRL adoption. Chen, Harris, Li and Wu (2015), and Li et al. (2012) find that XBRL adoption leads to a significant reduction in the cost of equity capital as a result of a decrease in information processing cost. Yoon, Zo and Ciganek (2011) and Kim et al. (2012) have documented an impact of XBRL on information asymmetry. Generally, XBRL use is associated with an increased level of transparency in financial reporting. If the level of financial disclosures is increased by adopting XBRL, information asymmetry is expected to be reduced, which could lead to a decrease of the cost of equity capital and an increase of a firm's stock market valuation (Yoon, Zo and Ciganek, 2011). However, the effect of XBRL on information asymmetry provides conflicting results. For example, Liu et al. (2014) find an increase in information asymmetry while Chen and Li (2013) indicate a decrease.

Kim et al. (2012) examine the mandated first-year XBRL adoption and find an increase in information efficiency and a decrease in stock return volatility. Focusing on intra-day market reaction, Cong et al. (2014) argue that XBRL reporting facilitates the convergence of information into the market and improves market efficiency. Liu et al. (2014) find a positive relationship between the XBRL implementation in the U.S. and the number of analysts following a firm, as well as analyst forecast accuracy.

Yoon et al. (2011), using Korean data, find that XBRL implementation is negatively associated with bid-ask spreads but Blankespoor et al. (2014) find the opposite results using U.S. data. Efendi et al. (2014) use post-earnings announcement drift as a measure of information efficiency and find that after XBRL adoption, the drift declines with positive unexpected earnings. Kim et al. (2013) find that XBRL adoption improves firms' disclosure policies with less opportunistic accruals. XBRL provide detailed information that can help investors interpret and confirm the earnings news.

2.2 SEC's XBRL mandate

In 2006, the SEC contracted with XBRL US to develop the foundation taxonomy. The U.S. GAAP Financial Reporting Taxonomy together with the FASB was de-

signed to represent common reporting practices and support the disclosure requirements of U.S. GAAP, allowing filers to tag information in their financial statements with the appropriate tags in the U.S. GAAP Financial Reporting Taxonomy (Debceny and al., 2011; Li and Nwaeze, 2015). For its part, the IFRS Foundation promotes XBRL use and supports the move towards structured electronic reporting by producing the IFRS Taxonomy for XBRL filings.

The SEC's objective was to enhance the informational efficiency in stock markets by making financial data easier to use and analyze for a broad range of investors (Efendi, Park and Smith, 2014).

Furthermore, the adoption of XBRL avoids the additional effort associated with multiple reconciliations of domestic financial statements to U.S. GAAP or IFRS. Thus, XBRL promotes the harmonization of international business reporting standards all around the world and provides the possibility to build information systems that enhance the comparison of financial reports of different firms within one or more sets of GAAP (Premuroso and Bhattacharya, 2008).

The SEC contends that this new search-facilitating technology will reduce informational barriers that separate smaller investors from larger, thereby reducing information asymmetry (Blankespoor, Miller and White, 2014).

2.3 Corporate Governance and Financial Reporting

The association between corporate governance and financial reporting quality can be viewed from two perspectives. First, Bushman, Chen, Engel and Smith (2004) find evidence that is consistent with firms building strong governance structures to counter poor quality earnings measures. The authors posit that limited transparency of firms' operations to outside investors increases demands on governance systems to alleviate moral hazard problems. This line of reasoning suggests that strong corporate governance structures, such as external monitoring, respond to poor earnings quality, i.e., improved governance is implemented to increase earnings quality.

A second perspective is that poor governance leads to poor earnings quality (e.g. Holthausen, Larcker and Sloan, 1995; Klein, 2002; Larcker and Richardson, 2004; Bowen, Rajgopal and Venkatachalam, 2008). This line of research suggests that earnings quality responds to governance structures. For instance, Athanasakou and Olsson (2012) separate innate and discretionary components of earnings quality. Their results suggest that better discretionary earnings quality is associated with better governance.

2.4 Hypotheses

Extensive disclosure helps financial analysts to produce valuable new information, such as more precise forecasts and buy/sell recommendations, thereby increasing demand on their services (Healy and Palepu, 2001). Lang and Lundholm (1996) provide evidence that firms with more informative disclosures have a larger analyst following, more accurate analyst earnings forecasts, and less dispersion in analyst forecasts. Hence, since XBRL documents can be analyzed quickly and efficiently by analysts, we anticipate a positive relationship between analyst following and the release

of XBRL extensions. We also anticipate that XBRL extensions should help analysts to make more precise earnings predictions and, therefore, a greater association between earnings and stock price. This gives rise to the following hypotheses:

H1. XBRL extensions attract financial analysts.

H2. XBRL extensions enhance the value relevance of earnings.

In addition, there is also the possibility that there is a moderating effect between firm-level governance and XBRL extensions. In that respect, Cormier and Magnan (2014) as well as Craighead, Magnan and Thorne (2004) both find that corporate voluntary disclosure and corporate governance can act as substitutes to one another. While they focus on either environmental reporting (Cormier and Magnan, 2014) or executive compensation reporting (Craighead et al., 2004), we infer that their evidence extends to financial reporting, including XBRL reporting. For instance, earnings are likely to be of high quality, i.e., relevant and reliable, if there is strong governance, a situation which will attract greater financial analysts' coverage and reduce information asymmetry. In such a context, XBRL extensions are likely to be less needed and less relevant for earnings valuation. XBRL extensions are likely to be more relevant in a context of weak governance, i.e. to act as a substitute for less effective governance mechanisms in reducing asymmetry. Overall, XBRL extensions should help market participants to better assess earnings valuation when the firm-level governance is weak. Hence, the following hypothesis:

H3. Corporate governance moderates the relation between XBRL extensions and the value relevance of earnings.

3. Method

3.1 Sample

The sample comprises 155 firm-year observations of Canadian firms included in the S&P/TSX composite index of Toronto Stock Exchange for years 2010 to 2015. We first choose U.S. cross-listed firms, for a 38 firm-year observations (8 firms) reporting under US-GAAP and providing extended (voluntary) XBRL information. Second, from SEDAR (System for Electronic Document analysis and Retrieval) Canadian database, we find 24 firm-year observations (13 firms) of Canadian firms reporting under IFRS providing XBRL extensions. This gives 62 firm-year observations (21 firms). Third, we match these 21 firms based on size (total asset) and industry membership based on listed firms composing the S&P/TSX index of the Toronto stock exchange for the same years. This matched sample gives 93 firm-year observations (21 X 6 years = 126 – 33 missing data essentially for the ISS Governance quality score = 93). This match sample is warranted since focusing on a sample of firms that report XBRL extensions is likely to create a sample selection bias. Hence, our final sample comprises 155 firm-year observations (42 firms). These large firms (av-

erage market capitalization of 13 billion Cd \$ per firm) represent more than 35% of the Canadian total stock market capitalization in 2015 and 55% of S&P/TSX index. Financial and governance variables are collected from Bloomberg database.

3.2 XBRL Database

In 2009, the U.S. SEC issued a rule requiring certain listed companies to submit their financial statements (10K and 10Q) in the XBRL format. Following a transition phase, all public companies and foreign private issuers listed in the United States are now subject to this regulation. Thus, a very large amount of XBRL files concerning firms operating in North America is now available, because all these files are publicly available on the EDGAR (Electronic Data-Gathering Analysis, and Retrieval) platform. The XBRL files are not only publicly available, but the SEC and XBRL US created multiple tools to make the data easy to collect and read. We can cite, for example, the EDGAR Dashboard XBRL Cloud, a free-to-use online service granting an access to any XBRL file in any web browser.

In Canada, some XBRL files are available online on the SEDAR web service. It is still a voluntary process for filers, but Canadian government is pushing towards a standard digital reporting for public companies, and XBRL is of course the favourite option. The situation is similar in Europe, the European Commission started consultations about the mandatory adoption of a standard business reporting language. In some European countries, XBRL initiatives already took place (in Belgium, the Netherlands, Spain, UK, etc.).

To build our XBRL voluntary disclosure database, we first imported XBRL financial statements from the SEC EDGAR platform, which contains all the XBRL files issued by listed companies since 2009. This set contains all the files submitted to the SEC. Since new files are continually published, we created a program to automatically find, download and store the new files. This program reads the RSS file available on the EDGAR website, and when it finds a file that is not in the database, it downloads it. The different files are stored in a way allowing further research (by CIK code, company name, issue date, etc.). We completed our database with Canadian XBRL files available on the SEDAR website. The import of Canadian files had to be done manually because there is no such platform as EDGAR allowing the automatic collection of data.

We built another program to count the number of tags belonging to a specific taxonomy in an XBRL file (written in Java). This program can be used to find the proportion of extensions in a given XBRL file, but also the total number of tags, the number of tags belonging to the reference taxonomy, and so on.

3.3 Empirical Models

We consider that the determination of XBRL extensions and stock pricing are closely intertwined. The possibility exists that XBRL extensions (voluntary disclosures) are correlated with instrumental variables like analyst following, corporate governance and earnings management. Hence, we first assess whether or not endoge-

neity exists between the variables using the Hausman test. Endogeneity tests (reported in the results section) confirm interrelations for Stock price and XBRL extensions for the model estimated on the full sample (including matched firms). This justifies relying on simultaneous equations.

The valuation model is inspired by the work of Feltham and Ohlson (1995) and Amir and Lev (1996). Such a model maps a firm's equity and earnings into its stock market valuation. The empirical models are the following:

Earnings management, analyst following, governance and XBRL extensions

$$\text{EXTENSIONS} = \text{EM} + \text{ANFOL} + \text{BSIZE} + \text{BSIZESQR} + \text{BOARDIND} + \text{GOV} \quad (1)$$

XBRL extensions, governance and value relevance of earnings

$$\text{PRICE} = \text{BVPS} + \text{EPS} + \text{EPS} * \text{EXTENSIONS} + \text{EPS} * \text{GOV} + \text{EPS} * \text{EXTENSIONS} * \text{GOV} + \text{EXTENSIONS} * \text{GOV} + \text{BSIZE} + \text{BSIZESQR} + \text{BOARDIND} + \text{EXTENSIONS} + \text{GOV} \quad (2)$$

Where: EXTENSIONS: % of voluntary XBRL extensions; EM: $|\text{Accruals}|/|\text{Cash flow from operations}|$ (scaled by total assets); ANFOL: Number of analysts following a firm; BSIZE: Board size; BSIZESQR: Board size square; BOARDIND: % of independent members on the board. PRICE: Stock price at year-end; BVPS: Book value per share; EPS: Earnings per share; GOV: ISS governance quality score.

3.4 Independent variables

EXTENSIONS. We focus on tags released in addition to those fixed by the regulator, i.e. extensions for a sample of firms reporting under US-GAAP as well as IFRS. Hence, the variable is computed as the percentage of voluntary tag disclosed on the total tags disclosed (voluntary / [voluntary + mandatory]). We anticipate a positive association between EXTENSIONS and PRICE.

EM. Prior research generally documents a negative association between earnings management and the level of transparency in corporate disclosure (e.g. Hunton et al., 2006; Lobo and Zhou). This is consistent with the argument that stock market participants assess the quality of financial reporting taking into account a firm's overall disclosure strategy. Leuz et al. (2003) develop different country-level measures of earnings management that capture various dimensions along which insiders can exercise their discretion to manage reported earnings. We refer to the magnitude of accruals as a proxy for the extent to which managers exercise discretion in reporting earnings. It is computed as the absolute value of a firm's accruals scaled by the absolute value of a firm's cash flow from operations. A high ratio suggests a high level of earnings management. Since we do not know much about the tension affecting the corporate strategy of XBRL disclosure and earnings quality, we do not make a prediction on the direction of the relation between EM and EXTENSIONS.

ANFOL. Analyst forecasts precision is likely to improve, as more information about a company is processed and disclosed by analysts (Alford and Berger, 1999). Lang and Lundholm (1996) provide evidence that firms with more relevant disclosures have a larger analyst following, more accurate analyst earnings forecasts, and

less dispersion in analyst forecasts. Hence, we anticipate a positive relationship between analyst following and the release of XBRL extensions.

GOV. Vafeas (2000) finds that earnings are more informative for firms with more effective board of directors while Dey (2005) reports that earnings credibility increases with board effectiveness. In this vein, Lapointe-Antunes et al. (2008) document that financial literate and independent audit committees constrain managerial opportunism. The majority of the prior literature on the relation between corporate governance and firm value, documents that good corporate governance is associated with a higher firm valuation (Bebchuk et al., 2009; Cremers and Nair, 2005; Yermack, 1996). Governance variables are introduced to capture how corporate governance, acting as a monitoring factor, affects voluntary disclosure such as XBRL extensions. The board's monitoring influences managerial discretion and induces firms to more transparency in organizational performance measurement and reporting (Fama, 1980; Eng and Mak, 2003; Cormier et al., 2009). Three variables are used to proxy for the board effectiveness: Independent board (BOARDIND); board size (BSIZE); board size squared (BSIZESQR). Frankel et al. (2011) find that board of directors' independence is associated with more voluntary disclosure such as non-GAAP measures. Chtourou et al. (2004) find that board size is associated with less earnings management, i.e., higher quality disclosure. Some prior studies assume that the relationship between board size and board performance might be curvilinear (e.g. Vafeas, 1999; Yermack, 1996; Eisenberg et al., 1998; Golden and Zajac, 2001). To control for the possible curvilinearity in the relationship between board size and EXTENSIONS as well as PRICE, we include the variable board size squared.

We also use the ISS governance quality score (GOV) collected from Bloomberg database. The grid is based on a total of 10 marks, 1 meaning an excellent and 10 meaning a weak score. The score is based on board structure, compensation, shareholder rights, and the audit. To facilitate interpretations, we change the score so that an excellent score is 10 instead of 1 (10 - total score +1). We anticipate a positive relationship between governance quality and stock price as well as XBRL extensions.

4. Results

4.1 Descriptive statistics

Table 1 provides some descriptive statistics about sample firms' financial variables and governance. For the full sample, on average firms are followed by near 11 financial analysts. ISS governance quality score averages 5.39 on a scale of 10. We observe earnings management with a ratio of $|\text{Accruals}|/|\text{Cash flow from operations}|$ (scaled by total assets) of 1.53. Earnings management is present when the ratio is greater than 1. This means that accruals increase in a larger proportions than cash flow from operations. We also observe that the quality of governance is higher for firms reporting under US-GAAP (EDGAR) (7.07) than other Canadian firms (5.53 for those reporting XBRL extensions and 4.74 for the matched sample with no XBRL extensions). Concerning the % of voluntary XBRL extensions, there is a large differ-

ence between firms reporting under US-GAAP (21.04%) versus those reporting under IFRS (13.80%). Finally, overall, except for % of extensions, and corporate governance, there are no major differences in the mean variables between sub-samples.

Table 1: Descriptive Statistics

	Matched sample			SEDAR			EDGAR			Total
	Mean	Min.	Max.	Mean	Min.	Max.	Mean	Min.	Max.	
PRICE	28.73	0.04	576.88	14.44	0.05	67.66	29.75	0.29	166.33	25.58
BVPS	10.52	-5.22	89.45	7.40	0.01	26.90	10.74	0.78	27.64	9.90
EPS	0.83	26.57	18.49	0.27	-1.67	4.12	0.65	-3.23	4.46	0.66
BSIZE	9.95	5	18	10.20	6	15	8.62	6	11	9.69
BOARDIND (%)	75.18	42.86	94.44	74.04	42.86	93.33	80.49	63.64	90.91	76.02
EXTENSIONS (%)	0	0	0	13.80	0	47.65	21.04	4	38	7.73
GOV	4.74	1	10	5.53	1	10	7.07	2	10	5.39
EM	1.49	0.01	47.15	1.63	0.01	16.67	1.55	0.03	18.37	1.53
ANFOL	8.44	0	21	12.96	0	42	13.95	3	29	10.66
N (Firm-year):	155	93		24			38			155

PRICE: Stock price at year-end; BVPS: Book value per share; EPS: Earnings per share; BSIZE: Board size; BOARDIND: % of independent members on the board; EXTENSIONS: % of voluntary XBRL extensions; GOV: ISS governance quality score; EM: $|\text{Accruals}|/|\text{Cash flow from operations}|$ (scaled by total assets); ANFOL: Number of analysts following a firm; LNVOLUME: Natural log of annual trading volume; Beta: Systematic risk.

4.2 Multivariate analysis

Given that a firm's information dynamics may affect XBRL disclosure and stock market value simultaneously, we first assess whether or not interactions exist between these variables using Hausman tests (residuals of XBRL extension model – equation 1 - added to the Price model - equation 2). Based on this procedure, the null hypothesis of no endogeneity is rejected with respect to PRICE and EXTENSIONS for the model with a sample of 155 observations ($t=2.72$; $p > 0.007$), but not for the model restricted to observations with extension ($t = 0.40$; $p > 0.423$). Moreover, focusing on firms that report XBRL extensions is likely to create a sample selection bias (Heckman, 1979). To correct this potential bias, Heckman's two-step procedure is used. Since results show endogeneity between stock price and extensions, we rely on a sample selection model with endogeneity treatment effect.

We rely on a two-step sample selection model for the sample involving 155 observations (full sample) and on OLS estimation for the model including 62 observations (restricted sample).

Findings presented in Table 2 show that analyst following is positively associated with the level of XBRL extensions (0.252; $p < 0.053$ for the restricted sample and 0.896; $p < 0.000$ for full sample). This is consistent with hypotheses 1. We also observe that good corporate governance is positively associated with XBRL extensions. Finally, a positive relationship with earnings management is observed (0.790; $p <$

0.005 for restricted sample and 1.124; $p < 0.001$ for full sample), suggesting that XBRL extensions would strategically be related to earnings quality; earnings quality leading to less voluntary XBRL extensions. Finally, we observe quite similar results when using a reduced sample on firms reporting extensions versus the full sample including a matched sample with no extensions.

For the full sample, since the dependent variable (EXTENSION) is censored with many observations at zero, an analysis using TOBIT may provide a powerful specification check. The TOBIT specification assumes that an unobserved latent variable index determines the level of the dependent variable so that observed values of XBRL extension disclosures are censored at zero whenever the latent variable index plus the disturbance term is negative (for an illustration, see Yermack, 1995). Results (not tabulated) remain similar to those reported in Table 2.

Table 2: OLS Regression on the association between XBRL Extensions and Earnings Management Controlling for Corporate Governance (with robust estimators)

Dependent variable: EXTENSIONS		Restricted to observations with extensions		Including a matched sample with no extensions	
EM	+/-	0.790	0.005	1.124	0.001
ANFOL	+	0.252	H1 0.053	0.896	0.000
BSIZE	+	-9.365	0.068	1.558	0.092
BSIZESQR	-	0.471	0.009	-0.106	0.040
BOARDIND	+	0.064	0.278	0.036	0.171
GOV	+	0.778	0.034	0.044	0.039
R Square		36.7%		38.8%	
F Statistic		12.7(0.000)		28.3(0.000)	
N:		62		155	

One-tailed if directional prediction, two-tailed otherwise.

EXTENSIONS: % of voluntary XBRL extensions; EM: $|\text{Accruals}|/|\text{Cash flow from operations}|$ (scaled by total assets); ANFOL: Number of analysts following a firm; GOV: ISS governance quality score; BSIZE: Board size; BSIZESQR: Board size square; BOARDIND: % of independent members on the board.

Concerning the incidence of XBRL extensions on the value relevance of earnings, we observe from results presented in Table 3 that XBRL extensions enhance the positive relationship between earnings and stock price as shown by the coefficient on the interaction term EPS*EXTENSIONS (1.214; $p < 0.055$). This is consistent with hypothesis 2. Moreover, the coefficient on EPS*GOV is also positive and significant (5.839; $p < 0.0350$). However, consistent with hypothesis 3, this positive association between EPS*EXTENSIONS and stock price is reduced for firms with a good governance since the coefficient on the interaction term EPS*EXTENSIONS*GOV (-0.212; $p < 0.009$) is negative and significant.

Furthermore, the joint F test EPS*EXTENSIONS + EPS*EXTENSIONS*GOV ($F = 3.44$; $p < 0.07$) show that the sum of coefficients is different from zero, suggesting a partial substitution effect between XBRL extensions and corporate governance. Results also suggest that voluntary extensions are more associated with stock price when

the governance is good as shown by the coefficient on the interaction term EXTENSIONS*GOV (0.159; $p < 0.052$).

Table 3: OLS Regression on the Value Relevance of XBRL Extensions Controlling for Corporate Governance (with robust estimators)

Dependent variable: Stock price		Restricted to observations with extensions	
	Sign	Coefficient	P value
BVPS	+	1.727	0.000
EPS	+	-29.324	0.140
EPS*EXTENSIONS	+	1.214	H2 0.055
EPS*EXTENSIONS*GOV	-	-0.212	H3 0.009
EPS*GOV	+	5.839	0.035
EXTENSIONS*GOV	+	0.159	0.052
BSIZE	+	27.723	0.031
BSIZESQR	-	-1.472	0.027
BOARDIND	+	-0.254	0.433
EXTENSIONS	+	-0.094	0.834
GOV	+	-3.28	0.166
R-Square		54.3%	
F Statistics		10.7(0.000)	
N:		62	
F test of coefficient difference			
EPS*EXTENSIONS + EPS*EXTENSIONS*GOV = 0		3.44(0.07)	
EPS*EXTENSIONS +			
EPS*GOV + EPS*EXTENSIONS*GOV = 0		3.72(0.06)	

One-tailed if directional prediction, two-tailed otherwise.

BVPS: Book value per share; EPS: Earnings per share; EXTENSIONS: % of voluntary XBRL extensions; GOV: ISS governance quality score; BSIZE: Board size; BSIZESQR: Board size square; BOARDIND: % of independent members on the board.

Focusing on firms that report XBRL extensions is likely to create a sample selection bias (Heckman, 1979). To correct this potential bias, Heckman's two-step procedure is used. In the Heckman procedure (Heckman, 1979; Lee, 1983), the residuals of the selection equation in a probit analysis (extensions/no extensions) are used to construct a selection bias control factor, i.e. the Inverse Mills ratio. Moreover, since results show endogeneity between stock price and extensions, we rely on a sample selection model with endogeneity treatment effect.

In Table 4, we present the two-step sample selection model for the full sample, controlling for selection bias and endogeneity. Results from a linear regression with endogenous treatment are in line with those presented in Table 3 for the restricted sample based on firms that reported voluntary XBRL extensions. The significance of the inverse Mills Ratio suggests a selection bias that warrants the need for a matched

sample of firms not reporting XBRL extensions. However, the selection bias does not significantly affect our results. Hence, the joint Chi2 test $EPS*EXTENSIONS + EPS*EXTENSIONS*GOV$ (14.61; $p < 0.06$) show that the sum of coefficients is different from zero. This suggests a partial substitution effect between XBRL and governance for stock market valuation.

For assessing the economic impact of $EXTENSIONS$ and GOV on the value relevance of earnings, we take the mean value of related variables from Table 1 ($EPS = 0.66\$$, $EXTENSIONS = 7.73$, $GOV = 5.39$), and coefficients from Table 4. We observe that $EXTENSIONS$ have a positive impact of 2.21\$ on stock pricing of earnings ($EPS*EXTENSIONS = 0.434 \times 0.66\$ \times 7.73 = 2.21\$$). As for the incidence of governance, we get an impact of 3.88\$ on stock pricing of earnings ($1.092 \times 0.66\$ \times 5.39 = 3.88\$$). Combining the net impact of the three interaction terms (adding the term $EPS \times EXTENSIONS \times GOV = -0.105 \times 0.66\$ \times 7.73 \times 5.39 = -2.89\$$), we obtain a net impact of 3.20\$ on earnings valuation ($2.21\$ + 3.88\$ - 2.89\$$). That means that $EXTENSIONS$ bring 2.21\$ on price valuation, GOV 3.88\$ and combined a total of 3.20\$ since we are in presence of a partial substitution effect.

Table 4: Sample Selection model with Endogeneity Treatment Effect on the Value Relevance of XBRL Extensions Controlling for Corporate Governance

Dependent variable:				
Stock price		Coefficient	Z Statistic	P value
BVPS	+	0.833	5.58	0.000
EPS	+	-0.991	1.58	0.113
EPS*EXTENSIONS	+	0.434	4.95	H2 0.000
EPS*EXTENSIONS*GOV	-	-0.105	-8.61	H3 0.000
EPS*GOV	+	1.092	7.03	0.000
EXTENSIONS*GOV	+	0.059	3.78	0.000
BSIZE	+	8.122	2.69	0.003
BSIZESQR	-	-0.384	-2.69	0.005
BOARDIND	+	-0.177	-1.68	0.075
EXTENSIONS 1/0	+	18.660	2.92	0.001
GOV	+	0.461	0.98	0.162
Dependent variable:				
EXTENSIONS 1/0 (treatment)				
EM	+/-	0.094	1.43	0.153
ANFOL	+	0.100	4.92	0.000
BSIZE	+	0.357	1.09	0.135
BSIZESQR	-	-0.024	-1.52	0.064
BOARDIND	+	0.006	0.60	0.272
GOV	+	0.001	0.02	0.492
Rho		-0.924(0.00)		
Inverse Mills Ratio		-11.758(0.00)		
Wald Chi2		459.6(0.00)		
N: 155				

Chi2 test of coefficient difference

EPS*EXTENSIONS + EPS*EXTENSIONS*GOV = 0	14.61(0.06)
EPS*EXTENSIONS + EPS*GOV + EPS*EXTENSIONS*GOV = 0	52.28(0.00)

One-tailed if directional prediction, two-tailed otherwise.

BVPS: Book value per share; EPS: Earnings per share; EXTENSIONS: % of voluntary XBRL extensions; EXTENSIONS I/0: Binary variable, 1 if extensions, 0 otherwise; BSIZE: Board size; BSIZESQR: Board size square; BOARDIND: % of independent members on the board; %Extensions: % of voluntary extensions; EM: $\frac{|\text{Accruals}|}{|\text{Cash flow from operations}|}$ (scaled by total assets); ANFOL: Number of analysts following a firm; GOV: ISS governance quality score.

Finally, findings (not tabulated) show a positive correlation between EXTENSIONS and trading volume ($p < 0.06$) and a negative relationship with bid-ask spread ($p < 0.014$). This suggests that voluntary disclosure of XBRL information reduces information asymmetry in the market place.

5. Conclusion

Adopted by the SEC and by IFRS Foundation, XBRL language has become a universal format to exchange financial data. It promotes the harmonization of international reporting standards and it is implemented in more than 60 countries around the world. The taxonomies fixed by regulators (e.g. SEC or IFRS Foundation) allow identifying tags which are computer readable. This language can extract both financial and corporate governance indicators used in financial statements. Thereby, investors and financial analysts can receive and analyze data rapidly and efficiently because computers recognize instantly the information in an XBRL document.

Research on XBRL impact on financial reporting are numerous and show a significant effect on transparency and reliability of information produced for market participants. However, these studies rarely take into account the possibility of completing the reference XBRL taxonomy by extension tags voluntarily released when an item cannot be properly represented by an existing tag. In this paper we investigate the determinants and value relevance of these extensions for a sample of Canadian firms reporting under US-GAAP as well as IFRS.

While the majority of prior research consider XBRL implementation as a uniform process (adoption or not), our research investigate the nature and the importance of taxonomy's extensions and argue that this practice is an element of a voluntary disclosure strategy. We document how voluntary disclosures in XBRL format affect the value relevance of GAAP earnings considering the quality of corporate governance.

We observe earnings management practice since accruals increase in larger proportions than cash flow from operations. The quality of governance is higher for firms reporting under US-GAAP than other Canadian firms for those reporting XBRL extensions. Concerning the percentage of voluntary XBRL extensions, there is a large difference between firms reporting under US-GAAP versus those reporting under

IFRS. We find that analyst following is positively associated with the level of XBRL extensions. We also observe that good corporate governance is positively associated with XBRL extensions. A positive relationship with earnings management is observed suggesting that XBRL extensions would strategically be related to earnings quality; earnings quality leading to voluntary XBRL extensions.

Concerning the incidence of XBRL extensions on the value relevance of earnings, we observe that extensions enhance the positive relationship between earnings and stock price but this positive association is reduced for firms with a good governance, suggesting a substitution effect between extensions and corporate governance.

Our study is subject to some limitations, which may also warrant further research. First, within the context of this study, all XBRL extensions are viewed as equivalent in terms of their impact on stock market participants. Future research may attempt to disentangle the relevance of individual extension items. Second, we rely on a single external measure of corporate governance. However, ISS governance quality score has been widely used in prior research. Finally, the sample size could be an issue and prevent us from making generalization of our results. However, sample firms represent a significant portion of market capitalization in Canada. This makes us somewhat confident about the relevance of results.

Prior research documents that institutional characteristics affect the information environment across countries, thus potentially influencing analysts' costs and benefits from collecting and processing corporate information. This research highlights the importance of considering XBRL extensions' practices and corporate governance when assessing the relevance of XBRL disclosures for stock market participants. Future research can fruitfully explore the interface between a firm's governance and XBRL extensions in other regulatory contexts, allowing learning more about the importance of controlling for such contexts if one wants XBRL disclosures to permit comparability of financial statement information among different jurisdictions.

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