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# The Effects of Mandatory XBRL Filings on the Timeliness of Financial Reporting: An Early Evidence

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## Abstract

*This paper examines the effect of SEC's mandatory XBRL (eXtensible Business Reporting Language) filing requirements on the timeliness of firms' financial reporting. By using XBRL, firms that produce financial data and business reports can automate the processes of data collection and XBRL enables preparers to utilize software to tag all financial data in their financial reports to the elements within a taxonomy. Hence, XBRL is expected to increase the efficiency and timeliness of financial data reporting, as well as improving accuracy of the financial information. Using a sample of 1,908 financial reports of public companies, we find the release horizons between firms' fiscal year (quarter) ends and SEC filing dates have been slightly shortened after mandating XBRL based reports compared to the period before mandating XBRL, but the difference was not statistically significant. We also find the effect of mandatory XBRL adoption on shortening the period between firms' fiscal year (quarter) end dates and SEC filing dates is slightly more salient for large companies than for small companies.*

*Key words: XBRL, Interactive Data, Timeliness*

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## **1. Introduction**

This paper examines the effect of SEC's mandatory XBRL (eXtensible Business Reporting Language) filing requirements on the timeliness of firms' financial reporting. XBRL is one of a family of "XML (eXtensible Markup Language)" languages, which has been becoming a standard means of communicating information between businesses and on the Internet.

In April, 2009, the SEC issued a final rule mandating the use of interactive data to improve financial reporting. Following experience with the voluntary filing program (VFP), the SEC mandated that all public companies must submit their filings in XBRL by October 31, 2014 (SEC, 2009). The rule includes a 3-year phase-in plan with large accelerated filers starting the XBRL filing from June, 2009.

XBRL revolutionizes financial reporting around the world. XBRL allows firms to report their financial and non-financial data to users in a computer-readable, standardized format. (AICPA) Instead of preparing PDF, HTML, or Microsoft Word documents for each individual set of users (e.g., investors, regulators, and creditors), firms prepare a single XBRL instance document, which includes all of their financial numbers and disclosures. For the XBRL filing, each item tagged with an approved, recognized label. Individual users can download the XBRL instance document to one of many available XBRL reader software applications, which convert the data into a format that is suited for each user's particular needs (e.g., investment decisions or loan decisions). (Taylor and Dzurainin, 2010)

The introduction of XBRL tags is expected to enable firm to automatically process business information by computer software, cutting out laborious and costly processes of manual re-entry and comparison. Thus, XBRL is expected to increase the efficiency and timeliness of

financial data reporting, as well as improving accuracy of the financial information. Using a sample of 1,191 quarterly reports of public companies, we investigate whether the timeliness of financial reporting, measured by gaps between firms' fiscal year ends and SEC reporting dates, have been improved after mandating XBRL based reports compared to the period before after mandating XBRL. We also examine whether the effect of mandatory XBRL adoption on the timeliness of financial reporting is more salient for large companies than for small companies.

The remainder of the paper is organized as follows. In the next section, we present an overview of XBRL reporting and summarize prior literature related to the effect of XBRL filings on financial reporting. Section 3 describes the research design to test the hypotheses. In section 4, we describe research design and data. Section 5 summarizes the empirical results from univariate analyses and multivariate analyses. In the final section, we offer concluding remarks.

## **2. What is XBRL?**

XBRL stands for eXtensible Business Reporting Language, which is a royalty-free international information format. XBRL is one of a family of "XML" languages, which has been becoming a standard means of communicating information between businesses and on the Internet. In the XBRL format, financial statement information could be downloaded directly into spreadsheets, analyzed in a variety of ways using commercial off-the-shelf software, and used within investment models in other software formats (SEC, 2009). XBRL tags helps cutting out laborious and costly processes of manual re-entry and comparison, and thus improve automated processing of business information by computer software.

Company can use XBRL for (1) internal and external financial reporting, (2) business reporting and exchange of information within all types of regulators, including tax and financial authorities, central banks, and governments, (3) filing of loan reports and applications, (4) credit risk assessments, (5) authoritative accounting literature, providing a standard way of describing accounting documents provided by authoritative bodies. (AICPA) By using XBRL, firms can automate the processes of data collection. For example, if the sources of information have been upgraded to using XBRL, data from different company divisions with different accounting systems can be assembled quickly, cheaply, and efficiently.

XBRL is expected to help analysts and other users of financial and business information find relevant facts, and thus will drive transparency and improve the efficiency of capital markets. XBRL will also reduce the cost associated with covering a company and making the market more accessible to small and mid-cap companies. By increasing analyst coverage of both small and large firms through a reduction in the cost associated with covering a company and improving investor access to the capital markets, XBRL better enables accounting profession to proactively fulfill its primary mission to protect the public interest. XBRL benefits firms by reducing the time and effort it takes them to generate reports for users. XBRL benefits information users by reducing the effort associated with converting company reports from various formats to a format that serves their unique needs. (Taylor and Dzurainin, 2010)

For accountants who serve in financial management, auditing, and information technology roles, XBRL will streamline the preparation of business and financial reports for internal and external decision making. XBRL will significantly improve the ability of accountants in financial management to more precisely direct and publish financial information

to investors, regulators, analysts, lenders, and other key stakeholders. As well as for reporting to the SEC, XBRL may be used for reporting to lenders, IRS and other regulating bodies. XBRL is also expected to facilitate principle-based accounting because it reduces the need to worry about where the item is reported, but only that it is. XBRL will facilitate convergence of accounting standards by the ability to align financial concepts among public taxonomies. (AICPA)

### **3. Prior research and hypothesis development**

XBRL has become increasingly important in improving the quality of firms' financial reporting (Hodge et al. 2004; Stantial 2007; Weirich and Harrast 2010). Plumlee and Plumlee (2008) provide some background on the SEC's efforts to incorporate XBRL into its filing process and a brief overview of the technical aspects of XBRL, and they observed that software validation of the instance documents and the extension taxonomies cannot identify all errors in XBRL documents.

Since the SEC initiated the *XBRL Voluntary Financial Reporting Program on the EDGAR System* (SEC, 2005), several studies examine the effect of XBRL Voluntary Filing Program (VFP). Callaghan and Nehmer (2009) examine internal and external characteristics of a sample of voluntary XBRL adopters and find evidence that early XBRL adopters are bigger, less financially leveraged and have lower corporate governance ratings than those of the control group. Bartley et al. (2010) evaluate the accuracy of early voluntary XBRL filings for 22 companies and find that all companies made varied errors in 2006, the first year of XBRL filing, which implies that the reporting quality is not satisfying.

With the XBRL filings under the SEC interactive data mandate, Debreceeny et al. (2010) investigates the extent of, and reasons for, calculation errors in the first round of filings of quarterly reports (10-Q). They find the evidence that one quarter of the filings by the initial 400 large corporations in the first round of submissions had errors, with differences reported monetary facts and the sum of other monetary facts that were bound together in a computation relationship.

In addition, Boritz and No (2009) and Srivastava and Kogan (2010) discuss conceptual frameworks for assurance of XBRL filings by an external assurance provider. Alles and Gray (2011) also discuss the cost of the assurance of XBRL filings, especially the cost relative to the rapidly falling cost of preparing those filings in the first place. However, to our knowledge, there is no prior research which examines the effects of mandatory XBRL filings on the timeliness of financial reporting.

Timeliness has been an important determinant of the usefulness of financial reporting. Delay in financial reporting increases the level of uncertainty associated with decisions for which the financial statement provide information. As a result, decisions might be nonoptimal or be delayed. (Givoly and Palmon 1982). By cutting out laborious and costly processes of manual re-entry and comparison, XBRL is expected to improve the timeliness of financial data reporting. This prediction yields our first hypothesis in the alternative form:

***H<sub>1</sub>: Mandatory XBRL adoption shortens the period between firm's fiscal year (quarter) end date and SEC filing date.***

Large companies are likely to have more transparent information environment than small companies. Callaghan and Nehmer (2009) states that larger companies are more likely to seek to improve their corporate governance appearance, by effectively adopting XBRL in US regulatory and corporate environments. We conjecture that the effect of mandatory XBRL adoption on the timeliness of financial reporting is more salient for large companies than for small companies.

Thus, our second hypothesis in the alternative form is:

***H<sub>2</sub>: The effect of mandatory XBRL adoption on reducing the period between firm's fiscal year (quarter) end date and SEC filing date is more salient for large companies than for small companies.***

#### **4. Research design and data**

We hypothesize that release horizons after mandatory adoption of XBRL are shorter than those before mandatory adoption of XBRL. We initially compare the release horizon (*HORIZON*), measured by the number of days between the release date and the report data in each of filing, before and after the mandatory adoption of XBRL. For multivariate analysis, control variables are identified based on the model developed by Boritz and Liu (2006), who examine the determinants of the timeliness of quarterly reporting in Canada.

First, we control a firm's quarterly (annual) loss (*LOSS*) as proxy for bad performance. We predict that financial reports are released less timely for firms with bad performance than for firms without bad performance because firms want to hide their bad news as longer as they could. We also control firm size (*SIZE*) since we predict that the association between release horizon



and firm size will be negative as large firms have more transparent information environment than small firms.

We control the change in total accruals (*CHGTAC*) and free cash flows (*FCF*) as proxy for the extent to which a firm has agency problems. If the free cash flows are low or if the change in total accruals is high, a firm has more agency problems. We predict that financial reports are released less timely for firms with high change in total accruals or for firms with low free cash flows. In addition, we also control leverage (*LEV*) and auditor (*BIG4*) in the model. To control for industry fixed effects, we also include the industry dummies in the model. Following Boritz and Liu (2006), we use the following estimated model comparing the release horizon over the two different regimes.

$$\begin{aligned}
 \text{HORIZON} = & \beta_0 + \beta_1 \text{XBRL} + \beta_2 \text{LOSS} + \beta_3 \text{SIZE} + \beta_4 \text{CHGTAC} + \beta_5 \text{FCF} + \beta_6 \text{LEV} \\
 & + \beta_7 \text{BIG4} + \text{IND} + \text{error}
 \end{aligned}
 \tag{1}$$

where,

HORIZON = release horizon, measured by the number of days between the release date and the report data

in each of filing;

XBRL = 1 if financial report has been filed with ‘Interactive Data’ and 0 other wise;

LOSS = 1 if the quarterly net income is negative and 0 otherwise;

SIZE = the log of total assets;

CHGTAC = change in total accruals, where total accruals are calculated by (Income before extraordinary

- items – net cash flows from operating activities) / Total assets;
- FCF = (Net cash flow from operating activity + interest paid + net cash flow from investing activity – capitalized interest)/(Total assets);
- LEV = long-term debt / total assets;
- BIG4 = 1 if the auditor is Big 4 and 0 otherwise;
- IND = the dummies for two-digit SIC industries

We hypothesize that the effect of mandatory XBRL adoption on the timeliness of financial reporting is more salient for large companies than for small companies. To assess the additional effect of firm size after the mandatory adoption of XBRL, we focus on an interaction variable of  $XBRL*SIZE$  as follows;

$$HORIZON = \beta_0 + \beta_1 XBRL + \beta_2 LOSS + \beta_3 SIZE + \beta_4 XBRL * SIZE + \beta_5 CHGTAC + \beta_6 FCF + \beta_7 LEV + \beta_8 BIG4 + IND + error \quad (2)$$

where,

HORIZON = release horizon, measured by the number of days between the release date and the report data

in each of filing;

XBRL = 1 if financial report has been filed with ‘Interactive Data’ and 0 other wise;

LOSS = 1 if the quarterly net income is negative and 0 otherwise;

SIZE = the log of total assets;

CHGTAC = change in total accruals, where total accruals are calculated by (Income before extraordinary

- items – net cash flows from operating activities) / Total assets;
- FCF = (Net cash flow from operating activity + interest paid + net cash flow  
from investing activity – capitalized interest )/(Total assets);
- LEV = long-term debt / total assets;
- BIG4 = 1 if the auditor is Big 4 and 0 otherwise;
- IND = the dummies for two-digit SIC industries

The data for post-XBRL filings are obtained from XBRL CLOUD Report database ([www.xbrlcloud.com](http://www.xbrlcloud.com)) from September 2009 to June 2010. The XBRL Cloud is not an official validation tool of the SEC, but is a validation tool created by a third party to assist with the XBRL filing process. The XBRL Cloud has been used as a collaborative tool to help vendors and filers interpret the SEC EDGAR Rules. All filings in XBRL CLOUD Report have been submitted to the SEC pass EDGAR validations otherwise they would not have been accepted by the SEC. (Hymer 2010). From XBRL CLOUD Report database, we collect 954 of 10-Q filings with XBRL and 207 of 10-K filings with XBRL and the release horizons are computed by comparing the SEC filing dates and firms' fiscal year ends. The data for pre-XBRL filings and for control variables are obtained from COMPUSTAT database from September 2008 to June 2009.

## **5. Empirical Results**

### **a. Univariate analysis**

Table 1 presents the results of univariate analysis to test the first hypothesis investigating whether mandatory XBRL adoption shortens the release horizons. For quarterly reporting (10-Q), the mean of release horizons for post-XBRL period is 34.14 days, which is shorter than that of pre-XBRL period (34.61 days) by 0.47 days and the difference is statistically significant at the 10% level. For annual reporting (10-K), the mean of release horizons for post-XBRL period is 50.98 days, which is also shorter than that of pre-XBRL period (52.16 days) by 1.18 days but the difference is not statistically significant.

**(Table 1) Horizons between Firms' Fiscal Year Ends and SEC Filing Dates for Pre-XBRL period and Post-XBRL period**

		Pre- XBRL	Post- XBRL	Difference	t- value	<i>p</i>
Quarterly Reporting	Mean	34.61	34.14	0.47	1.82	0.0686
	Std	5.92	5.43			
	N	954	954			
Annual Reporting	Mean	52.16	50.98	1.18	1.39	0.1657
	Std	10.17	6.86			
	N	207	207			

Table 2 Panel A and Panel B show the results of univariate analysis by firm size. For large firms, the means of release horizons for post-XBRL period are not significantly different from the means for pre-XBRL period although the release horizons have been slightly shorten for both the quarterly filings and annual filings. For small firms' quarterly filings, the mean of

release horizons for post-XBRL period is 34.33 days, which is shorter than that of pre-XBRL period (34.95 days) by 0.62 days and the difference is statistically significant at the 10% level. But, the mean difference for annual filings is not statistically significant.

**(Table 2) Horizons between Firms' Fiscal Year Ends and SEC Filing Dates for Pre-XBRL period and Post-XBRL period by Firm Size**

Panel A (Large Firms)

		Pre- XBRL	Post- XBRL	Difference	t- value	<i>p</i>
Quarterly Reporting	Mean	34.12	34.01	0.11	0.28	0.7784
	Std	6.22	5.29			
	N	464	453			
Annual Reporting	Mean	52.18	51.22	0.96	1.01	0.3138
	Std	6.84	6.53			
	N	100	99			

Panel B (Small Firms)

		Pre- XBRL	Post- XBRL	Difference	t- value	<i>p</i>
Quarterly Reporting	Mean	34.95	34.33	0.62	1.70	0.0897
	Std	5.61	5.47			
	N	472	460			
Annual Reporting	Mean	52.01	50.93	1.08	0.76	0.4467

	Std	12.62	6.98
	N	105	104

b. Multivariate analysis

Table 3 Panel A and Panel B report the results of multivariate analyses to test the first hypothesis investigating whether mandatory XBRL adoption shortens the period between firm's fiscal year (quarter) end date and SEC filing date.<sup>1</sup> For both quarterly filings (10-Q) and annual filing (10-K), the coefficients for XBRL are negative, but neither is statically significant. After mandating XBRL based filings, the release horizons have been slightly shortened compared to the period before mandating XBRL though not very significant.

**(Table 3) The Effects of XBRL filings on the Timeliness of Financial Reporting**

Panel A. Regression on quarterly filings (10-Q)

Dependent Var=Horizons Between Firms' Fiscal Year Ends and SEC Filing Dates

	Parameter	Standard		
Variable	Estimate	Error	t Value	Pr >  t
Intercept	38.6539	1.7803	21.71	<.0001

<sup>1</sup> As stated in the model (1) and (2), the regression analyses include the industry dummy variable (*IND*) as one of control variables. However, for brevity's sake, Table 3 and Table 4 skip the reporting *IND*.

XBRL	-0.3466	0.2571	-1.35	0.1778
LOSS	1.2297	0.3671	3.35	0.0008
SIZE	-0.3517	0.1009	-3.49	0.0005
CHGTAC	-0.2048	0.7055	-0.29	0.7716
FCF	-0.8923	1.5383	-0.58	0.5619
LEV	2.9968	0.8588	3.49	0.0005
Big4	0.4547	0.5259	0.86	0.3873
<hr/>				
N	1908			
Adj-R <sup>2</sup>	0.059			
<hr/>				

Panel B. Regression on annual filings (10-K)

Dependent Var=Horizons Between Firms' Fiscal Year Ends and SEC Filing Dates

Variable	Parameter	Standard	t Value	Pr >  t
	Estimate	Error		
Intercept	43.9469	6.4867	6.77	<.0001
XBRL	-1.1914	0.8456	-1.41	0.1596
LOSS	1.3114	1.2718	1.03	0.3031
SIZE	0.1609	0.3855	0.42	0.6765
CHGTAC	-12732.0	18796.0	-0.68	0.4986
FCF	10.0235	5.5919	1.79	0.0738
LEV	9.6351	2.9486	3.27	0.0012
Big4	2.5605	2.2219	1.15	0.2499
<hr/>				
N	414			
<hr/>				

Adj-R<sup>2</sup>                      0.0413

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Table 4 Panel A and Panel B 4 summarize the results of multivariate analyses to test the second hypothesis investigating whether the effect of mandatory XBRL adoption on the timeliness of financial reporting is more salient for large companies than for small companies. We interact the XBRL variable with the SIZE variable to test the additional effect of firm size after the mandatory adoption of XBRL. Since the expected signs for both XBRL and SIZE variables are negative, the sign for the interaction variable is expected to be positive. For both quarterly filings (10-Q) and annual filing (10-K), the coefficients for the interaction variables are positive, but neither coefficient is statically significant. The effect of mandatory XBRL adoption on shortening the period between firm’s fiscal year (quarter) end date and SEC filing date is slightly more salient for large companies than for small companies.

**(Table 4) The Effects of Firm Size on the Timeliness of Financial Reporting for post-XBRL filings period**

Panel A. Regression on quarterly filings (10-Q)

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Dependent Var=Horizons Between Firms' Fiscal Year Ends and SEC Filing Dates

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	<i>Parameter</i>	<i>Standard</i>		
Variable	Estimate	Error	t Value	Pr >  t
Intercept	39.78992	1.95997	20.30	<.0001
XBRL	-2.65063	1.68434	-1.57	0.1157
LOSS	1.25802	0.36755	3.42	0.0006
SIZE	-0.47112	0.13273	-3.55	0.0004



XBRL*SIZE	0.24096	0.17409	1.38	0.1665
CHGTAC	0.01568	0.72304	0.02	0.9827
FCF	-0.93412	1.53816	-0.61	0.5437
LEV	2.97619	0.85872	3.47	0.0005
Big4	0.45565	0.52577	0.87	0.3863
<hr/>				
N	1908			
Adj-R <sup>2</sup>	0.0595			

Panel B. Regression on annual filings (10-K)

Dependent Var=Horizons Between Firms' Fiscal Year Ends and SEC Filing Dates

Variable	Parameter	Standard	t Value	Pr >  t
	Estimate	Error		
Intercept	45.6169	7.2140	6.32	<.0001
XBRL	-4.5579	6.3949	-0.71	0.4764
LOSS	1.3277	1.2733	1.04	0.2977
SIZE	-0.0137	0.5070	-0.03	0.9784
XBRL*SIZE	0.3546	0.6677	0.53	0.5956
CHGTAC	-14151.0	19003.0	-0.74	0.4569
FCF	9.7640	5.6183	1.74	0.0830
LEV	9.6611	2.9517	3.27	0.0012
Big4	2.5496	2.2240	1.15	0.2523
<hr/>				
N	414			
Adj-R <sup>2</sup>	0.0395			

**6. Conclusion**

XBRL can provide users of financial reporting quicker access to the information they want in a form that's easily used and can help firms prepare the information more quickly and more accurately. After SEC mandated that all public companies must submit their filings in XBRL by 2014, XBRL has become more important in improving the quality of companies' financial reporting.

We examine the effect of SEC's mandatory XBRL filing requirements on the timeliness of firms' financial reporting. Using a sample of 1,908 financial reports of public companies, we find the release horizons between firms' fiscal year (quarter) ends and SEC filing dates have been slightly shortened after mandating XBRL based reports compared to the period before mandating XBRL, but the difference was not statically significant. We also find the effect of mandatory XBRL adoption on shortening the period between firms' fiscal year (quarter) end dates and SEC filing dates is slightly more salient for large companies than for small companies.

This paper has several limitations. First, the effect of concurrent events other than the passage of SEC's mandatory XBRL filings on timeliness of financial reporting may not have been perfectly controlled. Second, since this study is trying to find out early evidence on the mandatory adoption of XBRL filings, the sample size may not be large enough to test our hypotheses. Expansion of sample beyond 2009-2010 periods may need to be considered to increase the validity of the research.

Nonetheless, the empirical findings of this paper are of interest to regulators including SEC. By providing evidence on the effect of mandatory XBRL filings on the timeliness of financial reporting, the paper provides useful insights to accounting researchers, regulators, and market participants.

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