

The Impact of Accounting Regulation Complexity on Financial Reporting Lead-Time

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Abstract:

We examine the lead-time of financial reporting in the U.S. between 2000 and 2009. We use propensity-score matching to control for firm-specific characteristics while estimating the effects of accounting complexity. We find that most of the complexity measures are causing a delay in the release of financial reporting. We do not find support that regulatory changes with respect to measurement and disclosure of financial holdings cause a delay. However we find that each of the regulatory changes since 2001 up until 2009 have increased the delay between the fiscal year end and the earnings announcement date. In addition, the accumulation of exposure to the regulatory changes, except for one related to measurement and disclosure of financial holdings, monotonically increases the delay.

Keyword: lead-time, accounting regulation change, accounting complexity, relevance, propensity-score matching, attribute-based matching

1. INTRODUCTION

We examine the lead-time of financial reporting in the U.S. over the period 2000 to 2009. In particular, we investigate whether the ongoing increasing trend in financial reporting lead-time is a reflection of a gradual increase in accounting regulation complexity or is due to firm-specific characteristics. To do so we use a propensity-score matching model to control for firm-specific characteristics when examining the effects of accounting regulation complexity.

Relevance is a key characteristic for the usefulness of financial reporting and in order to be relevant information needs to be timely. Prior research up to the mid-1970s suggests a decreasing trend in the lead-time between the fiscal year end and the announcement of annual earnings (Givoly and Palmon 1982). However, there are recent signs that this decreasing trend is broken and that the lead-time of financial reporting is now increasing (Krishnan and Yang 2009). This development continued up to 2006 in spite of the Securities and Exchange Commission's (SEC) new filing requirement which reduced the deadline for filing annual reports from 90 to 60 days over a three-year period beginning 2003 (Krishnan and yang 2009).² One explanation brought forward for the increase in the lead-time between fiscal year end and annual earnings announcements is the enactment of Section 404 of the Sarbanes-Oxley Act of 2002 which went into effect in 2004 (Krishnan and Yang 2009). However, voices are now raised arguing that the steady increase in sheer volume of standards, regulations, and interpretations has caused accounting standards to become a source of complexity themselves (Palmrose 2009).

² Acceleration of Periodic Report Filing Dates and Disclosure Concerning Website Access to Reports. Release No. 33-8128. Washington, D.C.: SEC.

This study contributes to prior research by investigating whether the lead-time of financial reporting has indeed increased since the early 2000s and whether this trend is driven by an increase in accounting regulation complexity. We also contribute to the literature by using a propensity-score model to reduce the effects of potential misspecification caused by assumptions about the functional form of the relationship between test and control variables and the outcome. Finally, we add to the literature by extending the time period to investigate whether the change from a trend to an increasing trend is still prevailing (Givoly and Palmon 1982; Krishnan and Yang 2009).

We identify five accounting changes that have increased the complexity, that are related to standards and rules introduced between 2001 and 2008 and that may have caused a delay in earnings announcements. These accounting changes are as follows. First, the Statement of Financial Accounting Standards (SFAS) 133: *Accounting for Derivative Instruments and Hedging Activities*, promulgating that all derivatives (either assets or liabilities) are recognized at fair value and SFAS 138: *Accounting for Certain Derivative Instruments and Certain Hedging Activities*, which regulates the netting of foreign currency cash flow hedges, went into effect in June 2000. We capture the effects of these changes by deeming firms that report hedging gains and/or losses in comprehensive income as being exposed to these standards. Second, we also consider the release of SFAS 141: *Business Combinations* and SFAS 142: *Goodwill and Other Intangible Assets* in 2001 as an increase in accounting complexity. We capture these effects by distinguishing between firms with and without significant goodwill balances. Third, the SEC rules related to extended disclosure requirements in the Management's Discussion and Analysis section in the annual Form 10-K on off-

balance sheet arrangements and contracts was enacted in 2003. We capture this effect based on whether firms report unconsolidated subsidiaries or not. Fourth, SFAS 123R: *Accounting for Stock-Based Compensation* which went into effect in 2005 and mandates income statement recognition of share-based payments to employees is a further addition to accounting complexity. We capture this complexity by distinguishing between firms reporting stock option compensation expenses or not. Finally, SFAS 157: *Fair Value Measurements* introduced the requirement to disclose fair value holdings by category (Level 1 – mark-to-market price, Level 2 – mark-to-model price, and Level 3 – estimations of future cash flows) and reconcile movements in and out of Level 3. In addition, SFAS 159: *The Fair Value Option for Financial Assets and Financial Liabilities* providing companies with an option to value financial assets and financial liabilities even if it is not required under SFAS 157, also went into effect in 2007. We capture the exposure to the latter two accounting standards by identifying whether firms report financial holdings of the categories held for trading and/or available for sale.

We find that most of the accounting complexity effects we identified cause a delay in the release of the annual earnings. We do not find support for our prediction related to the most recent addition to regulatory changes with respect to measurement and disclosure of financial holdings under SFAS 157 and SFAS 159. However we find that all the other identified regulatory changes deemed to increase accounting complexity since 2001 up until 2009 have individually increased the delay between fiscal year end and the earnings announcement date. In addition to our main results, we find that the accumulation of exposure to the regulatory changes, except

for the one related to measurement and disclosure of financial holdings, monotonously increase the delay of release of information. We interpret our findings as an indication that recent accounting standards and regulations aimed at increasing the relevance of the information may have led to a decrease in financial reporting relevance by delaying the release of information to investors.

The remainder of the paper is organized as follows. Next section provides a description of the regulatory background and our hypothesis development. Section 3 discusses the research design to test our hypotheses followed section 4 describing our sample selection process. Section 5 provides the results and section 6 offers a conclusion.

2. REGULATORY BACKGROUND

Timeliness denotes the idea of information being available to decision makers in time to make a difference, i.e., to be relevant [The Conceptual Framework of the Financial Accounting Standards Board (FASB) 1980]. Among others, two key characteristics commonly discussed in relation to high-quality accounting information are relevance and faithful representation (previously referred to as reliability).^{3,4} There is an inherent tradeoff between the two concepts in that it for obvious reasons takes longer to achieve faithful representation at the expense of the degree of relevance. The time span between the period end and the publication of financial reports (henceforth referred to as lead-time) has a direct impact on the relevance of the information. Studies on changes in lead-time of financial reporting over time suggest a

³ The Concept Statement 2 and the Framework (1989) used the term reliability instead of faithful representation. The reason for the change of word is a wish to substitute the notion of verifiability with the idea of unbiased representation.

⁴ Statement of Financial Accounting Concepts No. 8. September 2010.

long-term decrease in lead-time up until the mid-1970s but an increase during the period 2002 to 2006 (Givoly and Palmon 1982; Krishnan and Yang 2009). Moreover, this increase seems to take place despite the Securities and Exchange Commission's (SEC) new filing requirement in 2003 where the number of days allowed decreased from 90 to 60 days during a three-year period as of 2003.⁵ Some argue that the recent increase in lead-time is the result of a trend towards more complex financial reporting (Krishnan and Yang 2009; Palmrose 2009)

There are a number of regulatory changes that took place during the last decade and that may explain this increase in financial reporting lead-time. First, the Statement of Financial Accounting Standards (SFAS) 133: *Accounting for Derivative Instruments and Hedging Activities* (SFAS 133) went into effect on June 15, 2000 (the implementation was postponed from June 15, 1999) and we expect to see the effects of this standard in financial reports with a fiscal financial year beginning in July 2000 and onwards. This standard promulgates that all derivatives (assets and liabilities) are recognized at fair value. This standard is so complicated that the FASB decided to create an implementation group to provide guidance on how to implement the standard.⁶ At the same time, an amendment to SFAS 133, namely SFAS 138: *Accounting for Certain Derivative Instruments and Certain Hedging Activities*, which regulates the netting of foreign currency cash flow hedges went into effect. Another change in accounting policies during the period under examination is related to accounting for goodwill. SFAS 141: *Business Combinations* and SFAS 142: *Goodwill and*

⁵ Acceleration of Periodic Report Filing Dates and Disclosure Concerning Website Access to Reports. Release No. 33-8128. Washington, D.C.: SEC.

⁶ <http://www.fasb.org/derivatives/index.shtml>

Other Intangible Assets went into effect in 2001. This policy change led to the abandonment of goodwill amortization and the adoption of an impairment test approach. The impairment test approach requires that impairment tests must be conducted at the level of the smallest discernable cash generating unit on a regular basis as opposed to systematic amortization of goodwill.

Furthermore, in 2003 the SEC issued two new rules related to the disclosure of off-balance sheet arrangements and contracts in the Management's Discussion and Analysis section of the annual Form 10-K⁷ and the disclosure on internal control in Exchange Act Periodic Reports.⁸ In addition, Section 404 of the Sarbanes-Oxley Act of 2002 was enacted in 2003, requiring disclosures about the status of the internal control system's ability to curb reporting errors and/or earnings management (Krishnan and Yang 2009). SFAS 123R: *Accounting for Stock-Based Compensation* which went into effect in 2005, mandating income statement recognition of share-based payments to employees, is a further addition to accounting complexity. Finally, the most recent changes that may have made financial reporting more complex are related to fair value accounting. SFAS 157: *Fair Value Measurements* introduced a requirement to disclose fair value holdings by category (Level 1 – mark-to-market price, Level 2 – mark-to-model price, and Level 3 – estimations of future cash flows) and reconcile movements in and out of Level 3. SFAS 159: *The Fair Value Option for Financial Assets and Financial Liabilities* provided companies with an option to value financial assets and financial liabilities even if it is not required under SFAS 157. Both

⁷ SEC Release No. 33-8182 Final Rule: Management's Discussion and Analysis about Off-Balance Sheet Arrangements and Aggregate Contractual Obligations.

⁸ SEC Release No. 33-8238 Final Rule: Management's Reports on Internal Control over Financial Reporting and Certification of Disclosure in Exchange Act Periodic Reports.

standards went into effect in 2007. Table 1 provides a summary of the regulatory changes deemed to increase accounting complexity between 2000 and 2009.

<Table 1 about here>

Based on the above, we predict that there is an ongoing increase in the lead-time of financial reporting due to regulatory requirements and hypothesize:

H1: *Recent accounting changes that have increased accounting complexity have also increased the lead-time of financial reporting over time.*

3. RESEARCH DESIGN

We use a one-to-one matched pair design to identify treatment firms (firms experiencing a specific increase in accounting complexity) and control firms (firms not exposed to a specific accounting complexity). Our matching algorithm uses all variables typically related to market demand for information and firm-specific incentives to release or withhold financial information. By doing so we generate samples where similar firms, exposed (treatment) and not exposed (control) to the accounting complexity, are compared. We use a logit model to estimate the probability to be exposed to each of the previously identified specific accounting changes as an approach to estimate propensity-scores.

The extant literature identifies two sources affecting the lead-time of financial reporting, namely the level of market demand (Givoly and Palmon 1982; Chambers

and Penman 1984; Diamond 1985; Healy and Palepu 2001; Sengupta 2004; Ball and Shivakumar 2005) and management incentives related to the timing of publishing financial information (Atiase et al. 1989; Haw et al. 2000; Owusu-Ansah 2000; Haw et al. 2003; Leventis and Weetman 2004; Lee et al. 2008). We use a propensity-score model (Rosenbaum and Rubin 1985) to match firms experiencing similar levels of market demand for information and having similar firm-specific incentives to examine whether regulatory complexity increases the lead-time of financial reporting.

3.1. Matching variables

Prior research suggests that changes in lead-time of financial reporting over time is not only driven by technical aspects related to the production of the information but also by investors' demand for more information (Givoly and Palmon 1982; Sengupta 2004; Ball and Shivakumar 2005). Specifically, previous research indicates that external stakeholders with no access to private information exert pressure on management to release financial reports as soon as possible (Healy and Palepu 2001; Ball and Shivakumar 2005; Eierle 2005). Ball and Shivakumar (2005) find that public companies recognize losses timelier compared to private companies, which they interpret as a result of different levels of information asymmetry across these types of companies. Investors are also concerned about receiving (timely) information from firms they are investing in as prior research shows that shorter lead-times are negatively associated with market liquidity measures such as trading volume (Sengupta 2004). In addition, improving disclosure practices (in this case timely reporting of useful information) leads to increased analyst following (Lang and Lundholm 1996;

Healy et al. 1999; Bushee and Noe 2000). Prior research also indicates that the demand for timely information varies across investor groups (Bushee and Noe 2000; Sengupta 2004). Transient investors demand more timely information in order to sustain their aggressive short-term trading strategies compared to block holders with a long-term interest who are less sensitive to short-term events (Bushee and Noe 2000; Sengupta 2004). We include the bid-asked spread (SPREAD) as a proxy for market demand for financial information (Chordia et al. 2001) in the propensity score matching model. We also control for analyst following using the number of analysts forecasting firms' annual earnings in the month of December and for whether the firm year end is at the end of December (Barth et al. 2001; Ettredge et al. 2006).

The second source affecting financial reporting lead-time is economic incentives to release or hold back information (Sengupta 2004). Management have the choice to release information in order to supply investors with relevant private information or to hold it back, either on grounds of wanting to reduce uncertainties in the information or simply to withhold information from the market to a later point in time. The extant literature suggests a number of factors that provide managers with incentives to disclose or withhold information to investors. Examples of such factors are reputational concerns, litigation risk, and profitability (Verrecchia 1983; Skinner 1994; Sengupta 2004; Beatty and Weber 2006; Kothari et al. 2009). In general, reputation and litigation concerns accelerate the release of bad news (Skinner 1994; Kasznik and Lev 1995; Kothari et al. 2009). Prior research indicates that some firms are more exposed to a higher litigation risk than other (Kasznik and Lev 1995; Sengupta 2004). Specifically, Sengupta (2004) finds that firms in the Drugs, R&D Services,

Programming, Computers, and Electronics industries are more sensitive to the threat of lawsuits. However, financial distress and career concerns may slow down the release of financial information (Gilson 1989). We therefore include a dummy variable *TECH* taking on the value of one if the firm is operating in the Drugs (Sic codes 2833-2836), R&D services (Sic codes 8731-8734), Programming (Sic codes 7371-7379), Computers (Sic codes 3570-3577), or Electronics (Sic codes 3600-3674) industries and zero otherwise. Furthermore, to capture the effect of profitability, we include a variable *LOSS* taking on the value one if the company is reporting losses and zero otherwise (Skinner 1994, 1997; Sengupta 2004). Following extant literature we also include size *SIZE* measured as the natural log of sales (Bushee et al. 2003; etc.) and leverage *LEV*. The latter variable is used as a control for the level of threat of financial distress (Kothari et al. 2009). We also control for closely-held shares *CLOSE* which is defined as closely-held shares scaled by total outstanding shares. Finally, the variable *ACOV* control for number of analysts following the firm. Hence, our logistic regression model is the following:

$$\text{Prob}(DECILE) = \frac{1}{1 + e^{-Z}} \quad (1)$$

$$\begin{aligned} \text{where } Z = & \alpha_0 + \alpha_1 SPREAD_{it} + \alpha_2 DEC_{it} + \alpha_3 ACOV_{it} + \alpha_4 TECH_{it} + \alpha_5 LOSS_{it} \\ & + \alpha_6 SIZE_{it} + \alpha_7 LEV_{it} + \alpha_8 CLOSE_{it} + \sum_{k=2000}^{2009} \alpha_k YEAR_{it} + \varepsilon_{it} \end{aligned}$$

3.2. Treatment and control firms

We then identify a measure for each accounting complexity added by new regulations. The proxy to identify firms exposed to SFAS 133: *Accounting for Derivative Instruments and Hedging Activities* and SFAS 138: *Accounting for Certain Derivative Instruments and Certain Hedging Activities* is a dummy variable taking on the value one if the firm reports hedging gains or losses in comprehensive income and zero otherwise. In order to capture whether a firm is exposed to the abandonment of amortization of goodwill under SFAS 141: *Business Combinations* and SFAS 142: *Goodwill and Other Intangible Assets* we create a dummy variable taking on the value one if a company reports a goodwill balance amounting to at least 20% of total assets and zero if the goodwill balance amounts to less than 5% of total assets. The third accounting complexity measure is related to the SEC Release No. 33-8182 Final Rule: Management's Discussion and Analysis about Off-Balance Sheet Arrangements and Aggregate Contractual Obligations (SEC Release No. 33-8182). We use the reporting of investments in unconsolidated subsidiaries as an indication of off-balance sheet arrangements. We assume that firms with unconsolidated subsidiaries are more likely to use Special Purpose Enterprises (SPEs) and the equity method for off-balance sheet financing activities and therefore we expect the complexity of financial reporting for this group of companies to increase after the SEC Release No. 33-8182 went into effect (Bauman 2003; Landsman et al. 2008). The next complexity measure is related to the SFAS 123R: *Accounting for Stock-Based Compensation*. We use an indicator of whether a firm reports stock option compensation expenses or not to capture whether a firm is exposed to further complexity caused by the revision of SFAS 123. Finally, we examine the potential increase in accounting complexity related to the implementation of SFAS

157: *Fair Value Measurements* (SFAS 157). We use a dummy variable taking on the value of one if a firm reports available for sale and/or held for trading holdings to capture firms likely to be affected by any accounting complexity caused by SFAS 157.

We run propensity-score models developed by Rosenbaum and Rubin (1985) on ten ordered levels of delays in financial reporting to match characteristics affecting financial reporting lead-time. That is, we follow Armstrong et al. (2010) and partition the number of days of delay into ten percentiles in order to relax the assumption that there is a strict monotonic association between the characteristics and the number of days of delay. We perform the matching separately at each delay percentile and by each year represented in the sample. In addition, we do this separately for each accounting complexity measure and match without replacement firms exposed to each measure and firms that are not exposed. By doing this, we control to some degree for potential bias typical for empirical studies where randomization is impossible to carry out (Lawrence et al. 2011).

Using the samples obtained through the propensity-score matching processes for each accounting regulatory change measure, we then conduct two types of tests of the difference in the lead-time between exposed and non-exposed firms. First, we conduct a pairwise means test before and after the introduction of each accounting complexity measure. Second, we test whether there is an increase in the delay in reporting the earnings announcement for each accounting complexity measure introduced using a model as specified below:

$$\begin{aligned}
\ln DELAY_{it} = & \beta_0 + \beta_1 SPREAD_{it} + \beta_6 DEC_{it} + \beta_7 ACOV_{it} + \beta_2 TECH_{it} \\
& + \beta_5 LOSS_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 CLOSE_{it} \\
& + \beta_6 HEDGE_{it} + \beta_7 GOODWILL_{it} + \beta_8 OFFBS_{it} \\
& + \beta_9 STOCKOPT_{it} + \beta_{10} FAIR_{it} + \beta_{11} AFTER_2003_{it} + \varepsilon_{it}
\end{aligned} \tag{2}$$

Where *SPREAD*, *DEC*, *ACOV*, *TECH*, *LOSS*, *SIZE*, *LEV*, and *CLOSE* are defined as above. *lnDELAY* is the natural log of the number of days between the fiscal year-end date and the date of the earnings announcement. *HEDGE* is a dummy variable taking the value one if a firm reports hedging gains or losses in comprehensive income and zero otherwise. *GOOWILL* is a dummy variable taking the value one if a firm reports a goodwill balance greater than 20% of total assets and zero if a firm reports a goodwill balance less than 5% of total assets. *OFFBS* is a dummy variable taking the value one if a firm reports unconsolidated subsidiaries and zero otherwise. *STOCKOPT* is a dummy variable taking the value one if a firm reports stock option expenses and zero otherwise. *FAIR* is a dummy variable taking the value one if a firm reports available for sale and/or held for trading financial assets and zero otherwise. We predict an incremental increase in the delay caused by the accounting changes firms are exposed to. That is, we predict that all coefficients related to the dummy variables representing accounting changes to be positive and significant. Finally, we add a variable indicating whether it is before or after 2003. The reason is that after 2003 two new regulatory requirements affecting all firms went into effect. First, the Sarbanes-Oxley Act of 2002, which increased the burden of financial reporting from 2004 and onwards, went into effect. Second, the SEC's new filing requirement reducing the number of delays for

filing annual reports from 90 to 60 days also went into effect. Since it is impossible to disentangle these events across treatment and non-treatment groups we only control for this by including a dummy variable. Since these events are driving the delay in financial reporting in opposite directions we do not predict any direction of the coefficient.

4. SAMPLE SELECTION PROCESS

We extract firm-year data of U.S. listed companies from 1999 to 2009. By analyzing data over this time period we corroborate our results with those of other studies finding an increase in lead-time after the introduction of the Sarbanes-Oxley Act 2002 (Krishnan and Yang 2009) and also extend prior research to 2009. All data except market data are extracted from Worldscope. The market data used to create the bid-asked spread variable was extracted from the CRSP database and the data used to determine analyst following was extracted from I/B/E/S. As shown in Table 2 Panel A, we obtain a sample of 6,612 firms and 50,049 firm-year observations.⁹ After excluding observations with missing data we obtain a final sample of 2,703 firms and 26,003 firm-year observations.

Table 2, Panel B offers information about the number of observations in the treatment and non-treatment groups for each accounting regulation change. We obtain a sample of 1,640 firm-year observations for the change in derivative accounting; a sample of 3,081 firm-year observations for the new rules on how to account for goodwill; 3,011 firm-year observations for the new disclosure rules about off-balance sheet arrangements; 2,172 firm-year observations for the new rules

⁹ In order to control for potential outliers, we winsorize all continuous variables on the 1% level.

related to share-based compensation; and finally, 1,346 firm-year observations for the change in fair value accounting.

<TABLE 2 ABOUT HERE>

5. RESULTS

Table 3 provides descriptive statistics of the variables representing characteristics affecting the lead-time of financial reporting used in the propensity-score matching model. Overall we find no significant difference across the two groups after the introduction of each accounting regulatory change. However we do find a larger increase in the delay after the introduction of accounting for derivatives and hedges (SFAS 133) and the switch to the impairment only approach with respect to goodwill (SFAS 141 and SFAS 142). We also find a monotonic increase in the delay of financial reporting for each measure introduced, from 49 days after the introduction of accounting for derivatives and hedges (SFAS 133) to almost 61 days after the introduction of accounting for share-based payments to employees (SFAS 123R). This is also the case for firms that are not exposed to the new accounting complexity measures but to a lesser degree. Interestingly though, the delay in financial reporting follows the same trend with respect to the introduction of fair value levels disclosure under SFAS 157. The natural log of days of delay is only 44 days compared to almost 61 days of delay after the disclosure requirements related to off balance sheet arrangement (SEC Release No. 33-8182) which was introduced before the fair value disclosure requirements. We believe that this is explained by the composition of the sample drawn to examine the introduction of fair value disclosure. The number of financial services companies is over-represented in the test of the effect on the delay

in financial reporting related to SFAS 157. There also seems to be significant differences across the treatment and non-treatment groups with respect to the independent variables in the matching model. In general, the treatment groups, with the exception of the sample related to the effects of SFAS 157, seem to have a smaller bid-asked spread, be less leveraged, and have a more widespread ownership structure.

<TABLE 3 ABOUT HERE>

Table 4 presents results from the multinomial logit regressions. We divide lead-time into deciles where 1 stands for the shortest lead time and 10 stands for longest lead-time. For each independent variable, Table 4 compares the deciles 2-10 to the decile with the shortest lead-time. Following Armstrong et al. (2010), we provide average coefficient estimates and aggregated Z-statistics in Table 4. The first column reports the average coefficient estimate across decile-specific estimation from the second through the tenth decile. In Table 4, the second column reports an aggregate Z-statistic, which is calculated as the sum of the individual decile Z-statistics divided by the square root of the number of deciles over which equation (1) is estimated. The final two columns report the number of years for which the year-specific coefficient is positive and negative, respectively.

Table 4 shows that compared to the first decile, other deciles have a higher SPREAD (mean coefficient 3.342), less analyst coverage (mean coefficient -0.158), are less profitable (mean coefficient 1.429), smaller in size (average coefficient -0.004), less leveraged (mean coefficient -0.175) and have higher percentage of closely-held shares (mean coefficient 0.018).

<TABLE 4 ABOUT HERE>

The pairwise comparison of the means of natural log of the lead-time is presented in Table 5. Consistent with Table 4, we find a significant difference between the treatment and the control group in the lead-time after the introduction of the change in accounting for goodwill under SFAS 141 and SFAS 142, the increase in required disclosure on off balance sheet activities under the SEC Release No. 33-8182, and the changed accounting rules for stock-based compensation to employees under SFAS 123R. We also find a longer lead-time for companies exposed to the change in the standards related to derivatives and hedges (SFAS 133) compared to those that are not, however, the difference is not significant. Finally, contrary to our prediction, we find that companies exposed to changes related to SFAS 157 and SFAS 159 exhibit a significantly shorter lead-time. We believe that this might be driven by the extreme turmoil on the financial markets at the time these standards went into effect. That is, investors and financial service firms affected by these standards knew that the value of financial holdings decreased during this period and there was no reason to hold back this information. On the contrary, since most firms were in the same situation, there was an incentive to release the information faster rather than holding it back.

<TABLE 5 ABOUT HERE>

As shown in Table 6 Panel A, we also collapse all treatment and control observations and regress the lead-time on all identified control variables and the

accounting changes.¹⁰ We find that all control variables are significant and taking on the predicted direction. All the accounting changes are positive and significant supporting our hypothesis that they are causing an increase in the lead-time, except for the measure capturing the introduction of SFAS 157 and SFAS 159. Contrary to our prediction, this variable is negative and significant. This concurs with our previous findings as discussed above. We also find that the variable controlling for two simultaneous events, AFTER_2003, is positive and significant at the 5% level suggesting that the Sarbanes-Oxley 2002 Act takes precedence over the effects of the SEC promulgated reduction in number of days allowed for filing annual reports. Panel B in Table 6 shows tests of the difference in magnitudes between coefficients of each accounting change. The coefficient of the variable capturing the introduction of SFAS 157 and SFAS 159 is significantly smaller than the other coefficients. We also find that of all accounting complexities introduced during the period, the regulation related to stock options seems to have caused the strongest increase in lead-time.

<TABLE 6 ABOUT HERE>

6. SENSITIVITY ANALYSIS

Using the combined samples drawn from the propensity-score matching process, we also examine the effect on the lead-time of the accumulated accounting changes firms are exposed to. We conduct this test by regressing the natural log of the

¹⁰ We run the estimation using a random GLS model and a robust regression with qualitatively the same results.

lead-time on dummies representing the number of accounting changes firms are exposed to.¹¹ However, based on previous results we exclude the variable representing exposure to SFAS 157 and SFAS 159 from this part of the analysis. As described in Table 7, Panel A, we find qualitatively similar results for all the identified control variables except for the variable representing the bid-asked spread. The coefficient is still positive, as predicted; however, it is no longer significant. As shown in Panel A in Table 7, the results suggest a monotonic increase in the lead-time for each additional accounting change a firm is exposed to. The results of testing the incremental differences between the different levels of accounting changes shown in Table 7, Panel B, suggest that there is a significant difference in the lead-time between firms being exposed to two compared to one additional accounting complexity (one-tailed p-value 0.006). There is a marginally significant increase between firms exposed to two accounting complexities compared to three (one-tailed p-value 0.088). Overall the difference between firms being exposed to one accounting complexity compared to four is significant at the 5% level (one-tailed p-value 0.024).

<TABLE 7 ABOUT HERE>

7. CONCLUSION

We believe that there is reason to assume that the volume and the complexity of new accounting standards, regulations and interpretations is causing a delay in the release of financial reporting and thereby negatively impacting the relevance of

¹¹ We run the estimation using a random GLS model and a robust regression with qualitatively the same results.

financial reporting. Despite the fact that we did not find support for our prediction related to the most recent addition to regulatory changes, namely the measurement and disclosure of financial holdings under SFAS 157 and SFAS 159, we still find that each of the regulatory changes between 2001 and 2009 have individually increased the delay between fiscal year end and the earnings announcement date. We believe that it is not possible to discern the effects of regulatory changes with respect to the measurement and disclosure of financial holdings under SFAS 157 and SFAS 159 due to the economic situation at the time these standards went into effect and we, therefore, leave that to be examined by future research. In addition to our main results, we also find that the accumulation of exposure to complex accounting changes causes a monotonic increase in the lead-time. Our results suggest that the development of accounting regulations towards a greater relevance by offering more information indeed causes a decrease in financial reporting relevance by delaying the release of information to investors.

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Table 1: Major Additions to Accounting Complexity between 1999 and 2009

Accounting Standards	Implications	Effective Date
SFAS 133: <i>Accounting for Derivative Instruments and Hedging Activities</i>	Promulgates that all derivatives (either assets or liabilities) are recognized at fair value	June 15, 2000
SFAS 138: <i>Accounting for Certain Derivative Instruments and Certain Hedging Activities</i>	Regulates hedge accounting for foreign currency cash flow hedges.	June 15, 2000
SFAS 141: <i>Business Combinations</i> and SFAS 142: <i>Goodwill and Other Intangible Assets</i>	Promulgated the abandonment of amortization of goodwill and the adoption of an impairment test only approach. This approach requires impairment tests down to the smallest discernable cash generating unit on a regular.	June 30, 2001
SEC Release No. 33-8182 Final Rule: Management's Discussion and Analysis about Off-Balance Sheet Arrangements and Aggregate Contractual Obligations	Furthermore, in 2003 the SEC issued two new rules related to further disclosure requirements in the Management's Discussion and Analysis section in the annual Form 10-K on off-balance sheet arrangements and contracts	April 7, 2003
The Sarbanes-Oxley Act of 2002 Section 404	Requires disclosures about the status of the internal control system's ability to curb reporting errors and/or earnings management.	July 30, 2002
SEC Release No. 33-8238 Final Rule: Management's Reports on Internal Control over Financial Reporting and Certification of Disclosure in Exchange Act Periodic Reports	Further disclosure on internal control in Exchange Act Periodic Reports.	August 14, 2003
The SFAS 123R: <i>Accounting for Stock-Based Compensation</i>	The standard mandates income statement recognition of share-based payments to employees.	January 1, 2006
SFAS 157: <i>Fair Value Measurements</i> .	Requires disclosure of fair value holdings by category (Level 1 – mark-to-market price, Level 2 – mark-to-model price, and Level 3 – estimations of future cash flows) and reconcile movements in and out of Level 3.	November 15, 2007
SFAS 159: <i>The Fair Value Option for Financial Assets and Financial Liabilities</i>	Provides an option to value financial assets and financial liabilities even if it is not required under SFAS 157.	November 15, 2007

Table 2: Sample Selection Process

Panel A: Total number of observation		
	Number of firms	Number of firm-year observations
Total sample extracted from Worldscope	6,612	50,049
<u>Missing observations</u>	<u>-3,909</u>	<u>-24,046</u>
Total	2,703	26,003
Panel B: Number of Observations in the Matched Sample Before and After Implementation of Complexity		
Before Hedge Accounting		N/A
After Hedge Accounting (2002-2009)		<u>1,640</u>
Total		N/A
Before Goodwill Accounting Change (1999-2001)		187
After Goodwill Accounting Change (2002-2009)		<u>3,081</u>
Total		3,268
Before Requirements of Increased Disclosure on Off-Balance Sheet Arrangements (2003-2005)		830
After Requirements of Increased Disclosure on Off-Balance Sheet Arrangements (2004-2009)		<u>2,181</u>
Total		3,011
Before Requirements of Recognition of Share-Based Payments to Employees (2003-2005)		341
After Requirements of Recognition of Share-Based Payments to Employees (2006-2009)		<u>1,831</u>
Total		2,172
Before Requirements of Disclosure of by Fair Value Categories of Financial Holdings (2005-2007)		822
After Requirements of Disclosure of by Fair Value Categories of Financial Holdings (2008-2009)		<u>524</u>
Total		1,346

Table 3: descriptive statistics of Variables Used in the Propensity Score Matching Estimation by Accounting Complexity Measure

		Hedge	Non-Hedge		Goodwill	Non-Goodwill		Off	Non-Off		Stock	Non-Stock		Fair Value	Non-Fair	
		Mean	Mean	Diff	Mean	Mean.	Diff	Balance	Balance	Diff	Options	Options	Diff		Value	Diff
InDELAY	Pre	N/A	N/A	N/A	3.692	3.695	-0.003	3.740	3.732	0.008	4.040	4.038	0.001	3.277	3.376	-0.099 ^{***}
	Post	<u>3.891</u>	<u>3.890</u>	0.001	<u>3.979</u>	<u>3.974</u>	0.004	<u>3.963</u>	<u>3.957</u>	0.006	<u>4.108</u>	<u>4.104</u>	0.004	<u>3.789</u>	<u>3.811</u>	-0.022
	Diff	N/A	N/A		-0.286 ^{***}	-0.279 ^{***}		-0.223 ^{***}	-0.225 ^{***}		-0.069 ^{***}	-0.065 ^{***}		-0.512 ^{***}	-0.435 ^{***}	
SPREAD	Pre	N/A	N/A	N/A	0.025	0.022	0.003	0.009	0.011	-0.003 ^{***}	0.008	0.008	0.000	0.010	0.002	0.007 ^{***}
	Post	<u>0.003</u>	<u>0.006</u>	-0.002 ^{***}	<u>0.006</u>	<u>0.008</u>	-0.002 ^{***}	<u>0.004</u>	<u>0.007</u>	-0.003 ^{***}	<u>0.009</u>	<u>0.012</u>	-0.003 ^{***}	<u>0.025</u>	<u>0.006</u>	0.019 ^{***}
	Diff	N/A	N/A		0.019 ^{***}	0.014 ^{***}		0.005 ^{***}	0.004 ^{***}		-0.002	-0.004 ^{**}		-0.016 ^{***}	-0.004 ^{***}	
DEC	Pre	N/A	N/A	N/A	0.989	0.989	0.000	0.810	0.841	-0.031 [*]	0.774	0.672	0.103 ^{***}	0.939	0.955	-0.016
	Post	<u>0.753</u>	<u>0.793</u>	-0.040 ^{***}	<u>0.687</u>	<u>0.741</u>	-0.054 ^{***}	<u>0.754</u>	<u>0.754</u>	0.000	<u>0.736</u>	<u>0.679</u>	0.056 ^{***}	<u>0.910</u>	<u>0.868</u>	0.042 ^{**}
	Diff	N/A	N/A		0.302 ^{***}	0.248 ^{***}		0.055 ^{***}	0.087 ^{***}		0.039	-0.008		0.029 ^{**}	0.087 ^{***}	
ACOV	Pre	N/A	N/A	N/A	7.412	6.118	1.294 ^{**}	7.195	6.636	0.559	4.874	4.202	0.672	4.373	11.276	-6.903 ^{***}
	Post	<u>6.231</u>	<u>6.701</u>	-0.470	<u>4.872</u>	<u>4.634</u>	0.239	<u>5.719</u>	<u>5.742</u>	-0.022	<u>3.633</u>	<u>3.053</u>	0.581 ^{***}	<u>1.998</u>	<u>4.513</u>	-2.515 ^{***}
	Diff	N/A	N/A		2.539 ^{***}	1.484 ^{***}		1.476 ^{***}	0.894 ^{***}		1.240 ^{***}	1.149 ^{**}		2.375 ^{***}	6.763 ^{***}	
TECH	Pre	N/A	N/A	N/A	0.075	0.032	0.043 [*]	0.010	0.059	-0.049 ^{***}	0.103	0.047	0.056 ^{***}	N/A	0.061	N/A
	Post	<u>0.034</u>	<u>0.055</u>	-0.022 ^{***}	<u>0.073</u>	<u>0.040</u>	0.033 ^{***}	<u>0.012</u>	<u>0.058</u>	-0.046 ^{***}	<u>0.111</u>	<u>0.037</u>	0.737 ^{***}	N/A	<u>0.052</u>	N/A
	Diff	N/A	N/A		0.002	-0.008		-0.002	0.001		-0.008	0.010		N/A	0.009	
LOSS	Pre	N/A	N/A	N/A	0.219	0.214	0.005	0.181	0.173	0.007	0.560	0.252	0.308 ^{***}	0.029	0.083	-0.054 ^{***}
	Post	<u>0.093</u>	<u>0.160</u>	-0.068 ^{***}	<u>0.128</u>	<u>0.207</u>	-0.080 ^{***}	<u>0.156</u>	<u>0.171</u>	-0.015	<u>0.412</u>	<u>0.227</u>	0.185 ^{***}	<u>0.307</u>	<u>0.162</u>	0.145 ^{***}
	Diff	N/A	N/A		0.092 ^{***}	0.007		0.025 [*]	0.002		0.148 ^{***}	0.026		-0.278 ^{***}	-0.079 ^{***}	
SIZE	Pre	N/A	N/A	N/A	6.470	5.521	0.949 ^{***}	6.779	5.887	0.891 ^{***}	3.850	5.620	-1.771 ^{***}	4.979	7.321	-2.343 ^{***}
	Post	<u>7.723</u>	<u>6.834</u>	0.889 ^{***}	<u>6.650</u>	<u>5.848</u>	0.802 ^{***}	<u>7.013</u>	<u>6.204</u>	0.810 ^{***}	<u>4.779</u>	<u>6.231</u>	-1.452 ^{***}	<u>5.127</u>	<u>7.378</u>	-2.251 ^{***}
	Diff	N/A	N/A		-0.180	-0.327 [*]		-0.235 ^{***}	-0.316 ^{***}		-0.929 ^{***}	-0.610		-0.148 [*]	-0.056	
LEV	Pre	N/A	N/A	N/A	2.656	4.518	-1.861 ^{***}	3.223	4.109	-0.886 ^{***}	2.116	3.015	-0.899 ^{**}	11.541	3.187	8.534 ^{***}
	Post	3.770	4.403	-0.633 ^{***}	<u>2.464</u>	<u>3.906</u>	-1.442 ^{***}	<u>3.306</u>	<u>3.548</u>	-0.242 [*]	<u>1.951</u>	<u>3.606</u>	-1.656 ^{***}	<u>12.805</u>	<u>3.590</u>	9.215 ^{***}
	Diff	N/A	N/A		0.192	0.611		-0.083	0.561 ^{***}		0.166	-0.591 ^{**}		-1.234 ^{***}	-0.402	
CLOSE	Pre	N/A	N/A	N/A	23.961	23.113	0.848	20.604	24.838	-4.234 ^{**}	22.772	46.465	-23.693 ^{***}	17.924	17.551	0.373
	Post	<u>16.478</u>	<u>20.125</u>	-3.547 ^{***}	<u>23.320</u>	<u>23.094</u>	0.226	<u>20.930</u>	<u>22.276</u>	-1.346	<u>24.867</u>	<u>29.793</u>	-4.926 ^{***}	<u>20.429</u>	<u>17.890</u>	2.539
	Diff	N/A	N/A		0.641	0.019		-0.326	2.561		-2.095	16.672 ^{***}		-2.505	-0.339	

A firm is classified as exposed to the rules on Derivatives and Hedge accounting under SFAS 133 if they reported hedging gains or losses in the comprehensive income and otherwise not.

A firm is classified as exposed to changes in accounting for goodwill under SFAS 141 and SFAS 142 if it reports a goodwill balance greater than 0.2 of total assets.

A firm is classified as exposed to the rules of off balance sheet disclosure under SEC No. 33-8182 if they report unconsolidated subsidiaries.

A firm is classified as exposed to the rules related stock-based payments to employees under SFAS 123R if it reports stock option expenses.

A firm is classified as exposed to the fair value disclosure requirements under SFAS 157 and SFAS 159 if it reports available for sale and/or held for trading financial assets.

lnDELAY is the natural log of number of days delay between the fiscal year end and the earnings announcement.

SPREAD is the bid-asked spread calculated as the average monthly difference between the bid and the asked price divided by the average of the bid and the asked price.

DEC is a dummy variable taking on the value one if the firm's fiscal year end is in December and zero otherwise.

ACOV is the number of analysts following the firm.

TECH is an indicator variable taking on the value one if the firm is operating in the Drug industry (SIC 2833-2836), R&D services (SIC 8731-8734), Programming (SIC 7371-7379), Computers (SIC 3570-3577), and Electronics (SIC 3600-3674) and otherwise zero.

LOSS is a dummy variable taking on the value one if the firm reports a loss and zero otherwise.

SIZE is the natural log of sales.

LEV is total assets divided by total common equity.

CLOSE is the percentage closely held shares.

Table 4: Propensity Score Estimation Using Multinomial Logistic Regression

Response variable: The decile with the smallest delay between fiscal year end and earnings announcement				
	Avg. Coeff.	Aggr. z-Statistic	Yrs with Pos.Coeff.	Yrs with Neg.Coeff.
Intercept	3.094	339.159	7	2
SPREAD	3.342	10.899	8	1
DEC	-1.459	447.157	2	7
ACOV	-0.158	559.491	0	9
TECH	-0.029	2.567	5	4
LOSS	1.429	389.075	9	0
SIZE	-0.004	149.081	6	3
LEV	-0.175	1526.003	0	9
CLOSE	0.018	288.065	9	0
Y2000	-0.423	3.763	0	9
Y2001	-0.463	6.380	0	9
Y2002	-0.956	37.756	0	9
Y2003	-1.037	46.148	0	9
Y2004	-0.940	38.612	0	9
Y2005	-0.900	35.471	0	9
Y2006	-0.902	34.343	0	9
Y2007	-0.957	37.405	0	9
Y2008	-1.056	45.190	0	9
Y2009	-1.810	117.312	0	9
	χ^2	p-value		
Likelihood ratio test	12267.3	<.001		
Score test	10185.1	<.001		
Wald test	6021.3	<.001		
Pseudo R ²	0.489			
n	18,540			

lnDELAY is the natural log of number of days delay between the fiscal year end and the earnings announcement.

SPREAD is the bid-asked spread calculated as the average monthly difference between the bid and the asked price divided by the average of the bid and the asked price.

DEC is a dummy variable taking on the value one if the firm's fiscal year end is in December and zero otherwise.

ACOV is the number of analysts following the firm.

TECH is an indicator variable taking on the value one if the firm is operating in the Drug industry (SIC 2833-2836), R&D services (SIC 8731-8734), Programming (SIC 7371-7379), Computers (SIC 3570-3577), and Electronics (SIC 3600-3674) and otherwise zero.

LOSS is a dummy variable taking on the value one if the firm reports a loss and zero otherwise.

SIZE is the natural log of sales.

LEV is total assets divided by total common equity.

CLOSE is the percentage closely held shares.

Table 5: Pairwise test of Means of the Natural log of Days Delay between Fiscal Year End and Earnings Announcement across Treatment and Control Groups Before and After the Introduction of each Accounting Complexity Measure

Accounting Complexity Measure		N	Difference Between Means across Treatment and Non-Treatment groups		Standard Deviation	Minimum	Maximum
				p-value			
Hedge	Pre	N/A	N/A	N/A	N/A	N/A	N/A
	Post	1,640	0.001	0.816	0.100	-0.677	0.698
Goodwill	Pre	187	-0.003	0.716	0.104	-0.602	0.311
	Post	3,081	0.004	0.017	0.104	-0.758	0.780
Off Balance Sheet	Pre	830	0.008	0.061	0.123	-0.616	0.693
	Post	2,181	0.006	0.004	0.103	-0.773	0.655
Stock Options	Pre	341	0.051	0.008	0.355	-1.476	1.799
	Post	1,831	0.004	0.058	0.100	-0.738	0.704
Fair Value	Pre	524	-0.099	0.000	0.208	-1.036	0.693
	Post	822	-0.022	0.000	0.120	-0.624	0.773

A firm is classified as exposed to the rules on Derivatives and Hedge accounting under SFAS 133 if they reported hedging gains or losses in the comprehensive income and otherwise not.

A firm is classified as exposed to changes in accounting for goodwill under SFAS 141 and SFAS 142 if it reports a goodwill balance greater than 0.20 of total assets.

A firm is classified as exposed to the rules of off balance sheet disclosure under SEC No. 33-8182 if they report unconsolidated subsidiaries.

A firm is classified as exposed to the rules related stock-based payments to employees under SFAS 123R if it reports stock option expenses.

A firm is classified as exposed to the fair value disclosure requirements under SFAS 157 and SFAS 159 if it reports available for sale and/or held for trading financial assets.

Table 6: Results from Regressing the Natural Log of the Delay between Fiscal Year End and Earnings Announcements on the Complexity Measures Firms are Exposed to and Control Variables Using the Matched Samples of each Accounting Complexity Measure.

Panel A: Regressing the Natural Log of the Delay between Fiscal Year End and Earnings Announcements on the Complexity Measures Firms are Exposed to

Variables	Predicted Sign	Coefficient	Robust Standard Deviation	p-value
Intercept	?	4.239	0.019	0.000
SPREAD	+	0.270	0.157	0.084
DEC	?	-0.188	0.007	0.000
ACOV	-	-0.029	0.001	0.000
TECH	-	-0.042	0.012	0.000
LOSS	+	0.103	0.008	0.000
SIZE	?	-0.024	0.002	0.000
LEV	?	-0.005	0.001	0.000
CLOSE	+	0.001	0.000	0.000
HEDGE	+	0.021	0.007	0.002
GOODWILL	+	0.014	0.006	0.030
OFFBS	+	0.029	0.006	0.000
STOCKOPT	+	0.046	0.006	0.000
FAIR	+	-0.243	0.012	0.000
AFTER_2003	?	0.179	0.014	0.000
R ²	0.49			
Number of observations	9,567			

Panel B: Test of Differences between Coefficients of Accounting Complexities

	p-value (two way)
HEDGE = GOODWILL	0.417
HEDGE = OFFBS	0.404
HEDGE = STOCKOPT	0.008
HEDGE = FAIR	0.000
GOODWILL = OFFBS	0.061
GOODWILL = STOCKOPT	0.000
GOODWILL = FAIR	0.000
OFFBS = STOCKOPT	0.042
OFFBS = FAIR	0.000
STOCKOPT = FAIR	0.000

SPREAD is the bid-asked spread calculated as the average monthly difference between the bid and the asked price divided by the average of the bid and the asked price.

DEC is a dummy variable taking on the value one if the firm's fiscal year end is in December and zero otherwise.

ACOV is the number of analysts following the firm.

TECH is an indicator variable taking on the value one if the firm is operating in the Drug industry (SIC 2833-2836), R&D services (SIC 8731-8734), Programming (SIC 7371-7379), Computers (SIC 3570-3577), and Electronics (SIC 3600-3674) and otherwise zero.

LOSS is a dummy variable taking on the value one if the firm reports a loss and zero otherwise.

SIZE is the natural log of sales.

LEV is total assets divided by total common equity.

CLOSE is the percentage closely held shares.

HEDGE is a dummy variable taking on the value one if a firm reported hedging gains or losses in the comprehensive income and otherwise zero.

GOODWILL is a dummy variable taking on the value one if a firm reports a goodwill balance greater than 0.20 of total assets and zero if goodwill amounts to less than 5% of total assets.

OFFBS is a dummy variable taking on the value one if a firm reports unconsolidated subsidiaries.

STOCKOPT is a dummy variable taking the value one if a firm reports stock option expenses and otherwise zero.
FAIR is a dummy variable taking the value one if a firm reports available for sale and/or held for trading financial assets and otherwise zero.
AFTER_2003 is a dummy variable taking on the value one if the observation is from after 2003 or later and otherwise zero.

Table 7: Results from Regressing the Natural Log of the Delay between Fiscal Year End and Earnings Announcements on the Number of Complexity Measures Firms are Exposed to (excluding SFAS 157 Fair Value) and Control Variables Using the Matched Samples of each Accounting Complexity Measure.

Panel A: from Regressing the Natural Log of the Delay between Fiscal Year End and Earnings Announcements on the Number of Complexity Measures Firms are Exposed to

Variables	Predicted Sign	Coefficient	Robust Standard Deviation	p-value
Intercept	?	3.957	0.032	0.000
SPREAD	+	0.142	0.163	0.383
DEC	?	-0.205	0.007	0.000
ACOV	-	-0.028	0.001	0.000
TECH	-	-0.045	0.012	0.000
LOSS	+	0.102	0.009	0.000
SIZE	?	-0.028	0.002	0.000
LEV	?	-0.008	0.001	0.000
CLOSE	+	0.001	0.000	0.000
COMPLEX1	+	0.336	0.025	0.000
COMPLEX2	+	0.353	0.026	0.000
COMPLEX3	+	0.365	0.026	0.000
COMPLEX4	+	0.372	0.030	0.000
AFTER_2003	?	0.182	0.014	0.000
R ²	0.47			
Number of observations	9,567			

Panel B: Test of Differences between Coefficients

	p-value (one way)
COMPLEX1 < COMPLEX2	0.006
COMPLEX2 < COMPLEX3	0.088
COMPLEX3 < COMPLEX4	0.360
COMPLEX1 < COMPLEX4	0.024

SPREAD is the bid-asked spread calculated as the average monthly difference between the bid and the asked price divided by the average of the bid and the asked price.

DEC is a dummy variable taking on the value one if the firm's fiscal year end is in December and zero otherwise.

ACOV is the number of analysts following the firm.

TECH is an indicator variable taking on the value one if the firm is operating in the Drug industry (SIC 2833-2836), R&D services (SIC 8731-8734), Programming (SIC 7371-7379), Computers (SIC 3570-3577), and Electronics (SIC 3600-3674) and otherwise zero.

LOSS is a dummy variable taking on the value one if the firm reports a loss and zero otherwise.

SIZE is the natural log of sales.

LEV is total assets divided by total common equity.

CLOSE is the percentage closely held shares.

COMPLEX1 is a dummy variable taking the value one if a firm-year observation is exposed to one accounting complexity measure and zero otherwise.

COMPLEX2 is a dummy variable taking the value one if a firm-year observation is exposed to two accounting complexity measures and zero otherwise.

COMPLEX3 is a dummy variable taking the value one if a firm-year observation is exposed to three accounting complexity measures and zero otherwise.

COMPLEX4 is a dummy variable taking the value one if a firm-year observation is exposed to four accounting complexity measures and zero otherwise.