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Nancy Harp

Mark Myring

Rebecca T. Shortridge

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Do Variations in the Strength of Corporate Governance Still Matter? A Comparison of the Pre- and Post-Regulation Environment

Nancy Harp · Mark Myring ·
Rebecca Toppe Shortridge

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Abstract Corporate scandals brought the issue of corporate governance to the forefront of the agendas of lawmakers and regulators in the early 2000s. As a result, Congress, the New York Stock Exchange, and the NASDAQ enacted standards to improve the quality of corporate governance, thereby enhancing the quantity and quality of disclosures by listed companies. We investigate the relationship between corporate governance strength and the quality of disclosures in pre- and post-regulation time periods. If cross-sectional differences in corporate governance policies affect the quality of financial disclosures, the quality of information available to analysts varies with such policies. Specifically, higher quality disclosures, produced as a result of strong corporate governance, should lead to more accurate and less dispersed analysts' forecasts. Our analysis suggests that voluntary implementation of stronger corporate governance enhanced the quality of disclosures in the pre-regulation period; however, exceeding current corporate governance standards does not appear to result in higher quality disclosures post-regulation. These results suggest that SOX and the stronger regulations enacted by U.S. exchanges were effective in reducing

variation in the quality of financial information available to investors.

Keywords Corporate governance · Disclosure quality · Analysts · Regulations · Sarbanes–Oxley Act

Abbreviations

SOX Sarbanes–Oxley Act of 2002
NYSE New York Stock Exchange
NASDAQ National Association of Securities Dealers
Automated Quotations

Introduction

Corporate scandals brought the issue of corporate governance to the forefront of the agendas of lawmakers and regulators in the early 2000s. In an effort to return confidence and stabilize markets, Congress, the New York Stock Exchange, and the NASDAQ enacted standards to improve the quality of corporate governance mechanisms (Switzer 2007).¹ One of the primary objectives of these initiatives is to enhance the validity of financial information by requiring corporate boards to be more independent and accountable. The Sarbanes–Oxley Act of 2002 directly states that the purpose of the Act is “to protect investors by improving the accuracy and reliability of corporate disclosures made pursuant to the securities laws, and for other purposes” (U.S. House of Representatives 2002, 1).

N. Harp
School of Accounting and Finance, College of Business and Behavioral Science, Clemson University, Clemson, SC, USA
e-mail: nharp@clemson.edu

M. Myring (✉)
Department of Accounting, Miller College of Business, Ball State University, Muncie, IN 47306, USA
e-mail: mmyring@bsu.edu

R. T. Shortridge
Department of Accountancy, College of Business, Northern Illinois University, DeKalb, IL, USA
e-mail: shortridge@niu.edu

¹ Congress passed the Sarbanes–Oxley Act (SOX) in 2002 and The New York Stock Exchange (NYSE) adopted Section 303A, Corporate Governance Listing Standards, in November 2003 (effective in late 2004). The NASDAQ passed a standard similar to Section 303A in November 2003.

Compliance with these standards, however, is expensive. According to a survey by RHR International, companies with more than \$4 billion in revenues spend an average of \$35 million to comply with Sarbanes–Oxley (Henry and Borrus 2005). Thus, opponents argue that the costs of SOX outweigh the benefits, and may make U.S. capital markets less competitive (He and Ho 2011).

There is an abundance of research assessing the impact of variations in corporate governance on the quality and quantity of financial disclosures. Studies investigating the relationship between earnings quality and corporate governance generally support the hypothesis that stronger corporate governance practices lead to higher quality earnings (see, for example, Bedard et al. 2004; Lee et al. 2007). Similarly, prior research generally provides evidence of an association between corporate governance and disclosure quality (see, for example, Beekes and Brown 2006; Beekes et al. 2007; Byard et al. 2006; Karamanou and Vafeas 2005). Finally, prior research shows that stronger corporate governance is associated with more extensive voluntary disclosures (Hidalgo et al. 2011; Mallin and Raggi 2012; Prado-Lorenzo and Garcia-Sanchez 2010; Zhang et al. 2012).

We extend this line of research by investigating the relationship between corporate governance strength and the quality of disclosures in pre- and post-regulation time periods. The enactment of more stringent regulations by the SEC and the stock exchange had far reaching impacts for publicly traded companies. SOX requires that each member on the audit committee of a listed company is independent. In addition, firms must disclose, in periodic reports to the SEC, whether their audit committee includes at least one member who is a financial expert. NYSE Section 303A tightens the definition of independence and requires firms to have a majority of independent directors. In addition, listed firms must have audit, nominations, corporate governance, and compensation committees composed entirely of independent directors. The regulations enacted by NASDAQ in Sec. 4350 are similar to those of the NYSE. These reforms were intended to increase the strength of corporate governance mechanisms, thereby enhancing the quantity and quality of disclosures by listed companies.²

Our research investigates the relationship between the strength of corporate governance and both forecast

accuracy and dispersion, which we use as proxies for the quality of disclosures. Prior research supports the proposition that the accuracy and the dispersion of analysts' forecasts are dependent on the quality of financial disclosures (Ashbaugh and Pincus 2001; Barron et al. 1998; Lang and Lundholm 1996; Mensah et al. 2004). If cross-sectional differences in corporate governance policies affect the quality of financial disclosures, the quality of information available to analysts varies with such policies. Specifically, higher quality disclosures, produced as a result of strong corporate governance, should lead to more accurate and less dispersed analysts' forecasts.

A primary objective of the regulations enacted following the financial scandals of the early 2000s was to increase the quality of financial disclosure in part by improving the strength of corporate governance. If these regulations resulted in more uniform corporate governance practices, the association between governance and financial information quality may be reduced. This would weaken the relationship between levels of corporate governance and analysts' forecast accuracy and dispersion in the post-regulation era. Thus, as SOX, NYSE Sec. 303A, and NASDAQ Sec. 4350 increased the regulatory environment in the U.S., variation in the level of corporate governance may not affect the quality of financial disclosure in the post-regulation era.

Our analysis suggests that voluntary implementation of stronger corporate governance enhanced the quality of disclosures in the pre-regulation period; however, exceeding current corporate governance standards does not appear to result in higher quality disclosures post-regulation. Specifically, we cannot detect a relationship between the strength of corporate governance practices and the accuracy or the dispersion of analysts' forecasts post-regulation. These results suggest that SOX and the stronger regulations enacted by U.S. exchanges were effective in reducing variation in the quality of financial information available to investors. Further, our results suggest that firms should carefully evaluate the benefits obtained and costs associated with their implementation of corporate governance practices that exceed those required under current law. Our results do not imply that compliance with strong corporate governance is not important; to the contrary, SOX, and other regulations result in more consistent disclosures across firms.

Background and Hypotheses

Prior research provides evidence that the quality and quantity of financial disclosures is impacted by the strength of corporate governance. Using forecast accuracy and dispersion as proxies for disclosure quality, the association

² A related line of research examines whether improvements in corporate governance strength are associated with improvements in operating performance, since more strict oversight may encourage management to more efficiently and effectively carry out their duties (e.g., Brown and Caylor 2009; Core et al. 2006; Klein, 1998). While regulations on corporate governance may have additional objectives such as enhancing operating performance, our study examines only the reforms' objective to improve the quantity and quality of financial reporting disclosures.

between disclosure quality and corporate governance has been established internationally (Beekes and Brown 2006; Beekes et al. 2007; Bhat et al. 2006) and in the U.S. during the pre-SOX time period (Byard et al. 2006). Prior to SOX, firms with stronger corporate governance are found to issue voluntary disclosures of management reports on internal controls (Bronson et al. 2006) and to discuss management's responsibilities for financial reporting (El-Gazzar et al. 2008). Additional research demonstrated that corporations with more efficient boards (Karamanou and Vafeas 2005) and more independent boards (Ajinkya et al. 2005) issue more frequent and accurate forecasts by management. Further, increases in the strength of corporate governance are associated with greater voluntary disclosures related to intangible assets (Hidalgo et al. 2011). Firms with strong corporate governance disclose more information (Kent and Stewart 2008) and more accurate information (Goodwin et al. 2009) during the initial adoption of International Financial Reporting Standards. Finally, studies using international data find that the extent and quality of social and environmental disclosures is associated with the strength of corporate governance mechanisms (Mallin and Raggi 2012; Zhang et al. 2012; Prado-Lorenzo and Garcia-Sanchez 2010).

Many studies find a positive association between the strength of corporate governance and earnings quality.³ Specifically, firms governed by boards with higher portions of independent directors are shown to be less likely to engage in earnings management (Klein 2002; Lee et al. 2007; Sarkar et al. 2008). In addition, firms with more independent boards of directors typically produce more conservative financial reports (Ahmed and Duellman 2007). Sivaramakrishnan et al. (2011) suggest that enhancement of corporate governance improves earnings quality only to the point when an adequate level of corporate governance is achieved.

The composition of the audit committee is also an important driver of earnings quality. Audit committee characteristics (such as expertise and independence) have been found to reduce the use of aggressive earnings management (Bedard et al. 2004). Additional research suggests that specific elements (e.g., accounting knowledge, financial sophistication, and supervisory expertise) of audit committee members enhance financial reporting quality (see Carcello et al. 2006; Dhaliwal et al. 2006; Krishnan and Visvanathan 2008; Xie et al. 2003). Overall, these studies suggest that independent boards and knowledgeable

audit committees contribute to stronger corporate governance practices and result in less earnings management.

In addition, prior research suggests that stronger corporate governance reduces occurrences of fraudulent misstatements of financial information. For example, Persons (2005), DeChow et al. (1996) and Beasley (1996) documented that the likelihood of fraudulent financial reports is lower for firms with stronger corporate governance practices. Using a sample of firms under investigation by the SEC for accounting fraud, Crutchley et al. (2007) found that weak corporate governance allowed the adoption of accounting procedures that resulted in earnings manipulation.

In sum, research using data from the pre-regulation era suggests that stronger governance yields higher quality and quantity of disclosures, lower propensity to manage earnings, and lower occurrences of fraud. The regulations enacted in the 2000s had a dramatic impact on corporate governance requirements for firms in the U.S. Numerous studies investigate the impact of these regulatory changes on the disclosure quality and the presence of earnings management. Most studies that compare pre- and post-SOX eras examine the impact of the regulation on earnings quality. For example, the passage of SOX has been shown to reduce accrual-based earnings management (Bartov and Cohen 2009). Research utilizing properties of analyst forecasts as proxies suggests that SOX increases the quality and transparency of financial disclosures (Arping and Sautner 2010; Begley et al. 2009).

Despite the enhancements in corporate governance and increases in disclosure quality that result from new regulations (i.e., SOX, NYSE Sec. 303A, NASDAQ Sec. 4350), few studies investigate whether corporate governance variations still affect disclosure quality and/or quantity. Chang and Sun (2009, 2010) examined corporate governance and earnings management in pre- and post-SOX time periods using samples of cross-listed foreign firms and U.S. firms, respectively.⁴ Their analysis suggests that individual measures of corporate governance strength were related to reductions in earnings management in the post-SOX period only; however, overall corporate governance scores exhibited a significant relationship with earnings management in both the pre- and post-SOX eras. A recent study by Brown and Lee (2010) found evidence of a decline in the strength of the relationship between corporate governance and equity grants to CEOs between pre- and post-

³ A notable exception to these findings is Koehn and Ueng (2005). Their analysis found no relationship between higher governance scores from the Institutional Shareholders Services (ISS) and earnings quality.

⁴ In both Chang and Sun (2009) and (2010), the authors used 2002–2003 proxy statements and earnings announcements after the SOX effective date of July 30, 2002 to form their “post-SOX” sample. We define the post-regulation period starting after January 1, 2005. Our definition is cleaner because the NYSE and NASDAQ changes were not effective until 2004 and probably took some time to be fully implemented.

regulation periods.⁵ Jennings and Marques (2011) evaluate the impact of the strength of corporate governance pre- and post- Regulation G.⁶ Their results suggest that non-GAAP disclosures did not mislead investors in the pre- or post-regulation period for firms with strong governance practices. The non-GAAP disclosures of firms with weak corporate governance, on the other hand, were misleading to investors in the pre-regulation period. During the post-regulation era, investors no longer appear to be misled by the non-GAAP adjustments for weak governance firms. Finally, Hossain et al., (2011) compared pre- and post-SOX earnings management between firms implicated by the SEC for backdating stock options and a matched control group of firms. Controlling for differences in corporate governance and internal control quality, they found that implicated firms had higher earnings management compared to the control group in the pre-SOX period, but this difference diminished in the post-SOX period.

Our paper attempts to determine if the well-documented, positive relationship between corporate governance and the quality of financial disclosures from the pre-regulation era continues into the post-regulation era. Strengthening corporate governance may continue to provide improvements in financial reporting; alternatively, increasing corporate governance past a certain point may not lead to higher quality financial disclosure. A study of international firms by Bhat et al. (2006) found that the level of corporate governance is more important for firms located in countries with fewer regulations. Further, Sivaramakrishnan et al. (2011) suggest that after reaching a threshold level for corporate governance, additional governance measures do not appear to result in higher earnings quality. Essentially, the ability of corporate governance to improve quality may be bounded. If regulations passed in the early 2000s elevated corporate governance to a sufficient level, exceeding those requirements may not lead to variations in reporting quality. Thus, we investigate whether the regulations enacted by the SEC and U.S. stock exchanges (i.e., SOX, NYSE Sec. 303A, NASDAQ Sec. 4350) elevated corporate governance of U.S. firms to a level where, once reached, further enhancements would not lead to significant improvements in the quality of financial reporting disclosures.⁷

⁵ While this study does not examine the relationship between corporate governance and disclosure quality, the evidence provided establishes a context where the positive effects of corporate governance improvements are diminished in the post-regulation period.

⁶ Regulation G was adopted in January of 2003 and requires a reconciliation of non-GAAP with GAAP performance measures. This Regulation was passed as a provision of SOX to improve financial disclosures for investors.

⁷ The enactment of regulations had far reaching implications for publically traded companies. Specifically, SOX:

In this study, we measure the quality of financial reporting disclosures using analysts' forecast accuracy and dispersion. Prior research on analysts' forecast properties documents a strong link between disclosure quality and forecast accuracy and dispersion. Lang and Lundholm (1996) find that firms with more informative discretionary disclosures are associated with higher forecast accuracy and lower forecast dispersion. Using data from multiple countries, Hope (2003) also finds that greater firm-level disclosure increases forecast accuracy; Hope's (2003) evidence also shows that greater enforcement of accounting standards is associated with higher forecast accuracy. Nonfinancial disclosures appear to improve forecast accuracy and dispersion as well. Vanstraelen et al. (2003) find that analysts' forecast accuracy is higher and dispersion is lower for companies that provide forward looking nonfinancial disclosures. Ashbaugh and Pincus (2001) find that analysts' forecast accuracy increases after non-U.S. firms switch to International Accounting Standards which tend to increase disclosure quality. DeChow et al. (1996) find that forecast dispersion also increases in response to decreases in financial reporting disclosure quality. Their study investigates firms subject to SEC enforcement actions and reports significant increases in analysts' forecast dispersion for firms identified by the SEC as manipulating their earnings. Firms with more conservatively biased financial disclosures are also associated with poorer forecast accuracy and higher dispersion (Mensah et al. 2004).

The research described above provides empirical evidence linking information quality to analysts' forecast accuracy and dispersion. Analytical studies of analysts' behavior provide models that illustrate the relationship between information quality and the characteristics of earnings forecasts (see Diamond 1985; Kim and Verrecchia 1997).⁸ These models show that analysts use two types of

Footnote 7 continued

1. Increased auditors' independence by limiting the auditors' ability to provide outside services (Section 201)
2. Improved internal controls and the assessment of material weaknesses (Section 404)
3. Strengthened the responsibility of executives by requiring CEOs/CFOs to certify financial statements (Sections 302)
4. Enhanced the corporate environment by requiring corporate codes of ethics for senior financial executives (Section 406)

In addition, all three regulations sought to improve corporate governance by improving the independence of the board of directors and its members' financial knowledge.

⁸ A related line of research examines whether individual analysts' ability to forecast earnings has a "general" component in addition to a "firm-specific" component (see, for example, Brown and Mohammad 2010). We focus on the relationship between a firm's information quality and analysts' forecast accuracy/dispersion since our primary interest is the effect of firm-specific variability in corporate governance pre- and post-regulation.

information to produce earnings estimates: information that is available to all analysts (i.e., common information) and information that is privately obtained or generated and, therefore, is not available to all analysts (i.e., idiosyncratic information). Publicly released financial statements are an example of common information. An example of idiosyncratic information is data that are obtained from proprietary forecast models. In addition, analysts are motivated to efficiently use all sources of information (both common and idiosyncratic) to produce the most accurate earnings forecasts. In settings where common disclosures are of inferior quality, analysts will tend to make less accurate forecasts (Barron et al. 1998).⁹ The quality of common information also affects analysts' reliance on private information. Specifically, analysts place more emphasis on their unique information when common information is of low quality (Barron et al. 2002). Thus, an increase in analysts' use of private information results in greater dispersion of earnings forecasts.

A primary objective of the new SEC and exchange regulations was to improve corporate governance thus increasing the quality of financial disclosures. As the quality of disclosures improves, analysts are expected to place less priority on obtaining private information (Barron et al. 2002). If analysts use less private information when firms have strong governance structures, analysts' forecasts for these firms are likely to have less dispersion. However, these relationships will only exist if variations in corporate governance affect the quality of financial disclosures. If the enhanced regulations resulted in stronger and more uniform corporate governance practices or if the benefits of exceeding prescribed policies diminished, the association between governance and financial information quality may be reduced. This would weaken the relationship between corporate governance and analysts' forecast accuracy and dispersion. We directly investigate the possibility that the relationship between corporate governance and analysts' forecast accuracy and dispersion weakened from the pre- to post-regulation eras. We test the following two hypotheses in both pre- and post-regulation periods:

H1 Variations in corporate governance impact the accuracy of analysts' forecasts

H2 Variations in corporate governance impact the dispersion of analysts' forecasts

Research Methodology and Sample

We examine the impact of variation in the strength of corporate governance on the quality of financial information releases. Specifically, measures of analysts' forecast accuracy and dispersion are regressed on variables quantifying the strength of corporate governance as well as variables which control for differences in firm attributes. The identification of an association between various levels of corporate governance and forecast consensus/accuracy suggests that the quality of corporate governance impacts the quality of information available to financial analysts and improves their estimates of earnings. An explanation of the dependent and independent variables used in the analysis follows.

Dependent Variables

Two proxies for the quality of financial information are used in our analysis: forecast accuracy and forecast dispersion. Forecast accuracy is a common proxy for information quality (see, for example, Byard et al. 2006) because analysts who possess high quality information should produce more accurate earning forecasts. Following Byard et al. (2006), we measure forecast accuracy as the absolute difference between earnings forecast and the annual earnings report, deflated by the stock price.

$$\text{Accuracy}_t = |\text{Forecast}_t - \text{Actual}_t| / \text{Price}_{t-1}$$

Forecast_t represents the consensus annual earnings per share (EPS) forecast immediately prior to the release of earnings. Actual_t is the firm's actual EPS. Price_{t-1} is the price of a company's stock 1 month prior to the earnings release.

Barron et al. (1998) show that consensus among analysts' forecasts is also associated with higher quality financial disclosures. We measure dispersion as the standard deviation of analysts' earnings forecasts deflated by the stock price the month prior to the release of the consensus forecast.

$$\text{Dispersion}_t = \text{Standard deviation}(\text{Forecast}_t) / \text{Price}_{t-1}$$

Standard deviation (Forecast_t) is calculated using the standard deviation of the consensus annual EPS forecast immediately prior to the release of earnings. Price_{t-1} is the price of a company's stock 1 month prior to the earnings release.

⁹ An analytical study by Beretta and Bozzolan (2008) on the richness of disclosure content showed that the richness component of disclosure quality was positively related with forecast accuracy and negatively related with forecast dispersion. In addition, a recent study by Drake, et al. (2009) identified disclosure quality as an important factor in reducing investor's mispricing of the accruals and cash flow components of earnings (i.e., the accrual anomaly). Higher disclosure quality may also assist analysts in making more accurate earnings forecasts by reducing their overreaction to the accruals component of earnings. Also see Chan, et al. (2004) for their analysis of current accruals' impact on future earnings and how the accrual effect can be used to improve forecast accuracy.

Independent Variables

We are interested in measuring the impact of corporate governance on the information environment of analysts. Most prior research utilizes quantitative scores as measures of the strength of corporate governance. For example, many studies evaluate individual components of governance including the percentage of outside directors on the board and the number of meetings held by the audit committee and the total board (Farber 2005; Kanagaretnam et al. 2007; Karamanou and Vafeas 2005; Vafeas 1999). Recent studies utilized broad measures of the overall strength of corporate governance. These measures include Institutional Shareholders Services, which utilizes a ratings template and Governance Metrics International which rates firms relative to each other.¹⁰ In our paper, we utilized the Gomper's Index as an overall measure of the strength of corporate governance. The Gomper's Index classifies firms as democracies (good for shareholders) and dictatorships (bad for shareholders) based on 24 governance traits (Gompers et al. 2003). We code the Gomper's Index, *G_INDEX*, as 0 if a firm is classified as a democracy and 1 if it is classified as a dictatorship. If strong corporate governance improves the information environment of analysts, firms classified as democracies should result in more accurate and less dispersed forecasts.

In addition, we include three specific indicators of the strength of corporate governance; *DUAL*, *B_SIZE*, and *%IND*. *DUAL* indicates whether or not the CEO is also the chairman of the board. Prior research (Core et al. 1999; Jensen 1993) suggests that firms with a separate CEO and Chairman of the Board have stronger corporate governance. Thus, the analysts' forecasts should be more accurate and less dispersed for firms which separate these two positions. *B_SIZE* measures the number of members on the board of directors and *%IND* measures the percentage of the board that is deemed to be independent. As *B_SIZE* gets larger, the quality of governance may be strengthened as larger boards are more likely to have more expertise (Kanagaretnam et al. 2007). It is also possible that as the board size increases, the effectiveness of the board declines (Jensen 1993; Yermack 1996). Thus, we do not make a prediction on the sign for board size.

Many view board independence as a necessary condition for strong corporate governance (Uzun et al. 2004). Research by Klein (2002) reports lower abnormal accruals

as the percent of independent board members increases. Xie et al. (2003) documents that independence decreases earnings management, perhaps because of more effective monitoring. Hence, as *%IND* gets larger, corporate governance is improved and should result in more accurate and less dispersed forecasts.

We incorporated several control variables that impact analysts' forecast accuracy and dispersion in prior research. *NUM* is the number of analysts providing earnings forecasts. Lang and Lundholm (1996) found that firms with high quality financial disclosures are followed by more analysts than firms with low quality financial disclosures. Additionally, Brown (1997) documented improved forecast accuracy for firms with larger analyst following. *P/E* is the price to earnings ratio, which is a measure of the market's perception of the growth potential of earnings. Firms with higher growth often have higher variability in earnings. Both Lang and Lundholm (1996) and Brown (1997) demonstrated that larger firms have greater forecast accuracy, perhaps because of increased public scrutiny. Thus, we include the log of market capitalization, *LOG_SIZE*, as a measure of firm size. We also include a dummy variable, *LOSS*, which takes the value of "1" in a year in which a firm reports a net loss. Analysts have more difficulty predicting losses, thus the accuracy of forecasts in loss years is likely to decline and the dispersion of the forecasts is likely to increase. Our final control variable, *EPSSTAB*, is the 5-year earnings stability measure provided by *I/B/E/S*. This variable measures the average difference between EPS and an EPS trend line. Firms that report more consistent earnings over time are likely to result in forecasts that are more accurate and less dispersed. Barron et al. (2002) document that firms with greater variability in earnings (as evidenced by larger changes in net income and larger earnings per share deviations) indicate that the prior year's earnings are potentially less useful as a predictor of future earnings. This may encourage market participants, including analysts, to increase their private information acquisition activities (Barron et al. 2002).

Sample

Our sample is comprised of firms that have data available from The Corporate Library, Compustat and *I/B/E/S*. The Corporate Library database contains information on the corporate governance mechanisms and structure of boards of directors of publically traded companies in the U.S. We use this data to obtain the *DUAL*, *B_SIZE*, *%IND*, and *G_INDEX* variables. We calculated the market capitalization of sample firms as well as their market to book ratios using data from Compustat. We obtained analysts' forecast of EPS, actual EPS and the number of analysts following a firm from the *I/B/E/S* database.

¹⁰ Koehn and Ueng (2005) provides a comprehensive overview of the distinction between Governance Metrics International and Institutional Shareholder Services. See Brown and Caylor (2006) for an example of a broad measure of corporate governance strength based on ISS information. Specifically, Brown and Caylor (2006) use ISS information to create a measure called "Gov-Score" that includes both internal and external corporate governance provisions.

Data were collected for the years 2002–2008. Matching across the three data sources resulted in a final sample of 2,929 firms with complete observations. The sample is divided into pre-regulation (2002–2004) and post-regulation (2005–2008) periods. A total of 1,101 (1,048) complete observations are available in the pre-regulation period and 1,828 (1,761) are available in the post-regulation period for the forecast error (standard deviation) regressions.¹¹

Results

The descriptive statistics for the sample firms are provided in Table 1. The table includes *t* tests for differences in means and Wilcoxon tests for differences in medians in the last two columns. Analysts' forecast errors tend to be relatively small compared to stock price, with a mean forecast error of 2 % in the pre-regulation period and 1.3 % in the post-regulation period. Interestingly, the mean and median of the analysts' forecast errors decreased significantly from the pre- to the post-regulation periods. The dispersion in the forecast errors, measured as the standard deviation of the errors, also decreased significantly in the post-regulation years. These results might suggest that policies in the post-regulation era improved the quality of financial disclosures resulting in better analysts' forecasts. The corporate governance characteristics reveal some interesting facts about our firms from pre- to post-regulation. First, the number of firms with a single CEO/Chairman of the Board decreased significantly from the pre- to the post-regulation period. In the pre-regulation period, 35.6 % of firms had a joint CEO/Chairman of the Board. Post-regulation, only 17.6 % reported a joint position. In addition, the percent of independent board members increased from the pre- to the post-regulation years. The size of the board was not significantly different between the two time periods. Overall, these results suggest that firms implemented stronger governance practices in the post-regulation period thus supporting the proposition that the information environment improved during this time period.

Table 1 also reports that some of the control variables changed significantly from the pre- to the post-regulation period. The mean number of analysts, NUM, following the firms decreased from the pre- to post-regulation period. Further, the size of the sample firms significantly decreased between the pre- to the post-regulation periods. Finally, the number of loss years decreased from 9 % in the pre-regulation period to 4 % in the post-regulation period. The P/E

multiple and the I/B/E/S measure of earnings stability increased across the two periods.

Pearson correlations among the variables are presented in Table 2. Correlations using data from the pre-regulation period are provided above the diagonal while data from the post-regulation period are provided below the diagonal. Both the G_INDEX and B_SIZE variables have a negative and significant relation with forecast errors and dispersion in both the pre- and post-regulation periods. Most of the control variables are significant in the expected direction. For example, in both periods, the number of analysts is negatively related to the forecast error. In both time periods, firms with losses, denoted with a 1-0 dummy variable, are associated with larger forecast errors and greater dispersion among analysts. None of the correlations between control variables and variables of interest appear large enough to suggest multicollinearity is a problem.¹²

Table 3 reports regression results for the relationship between corporate governance and analysts' forecast errors. The first column reports the regression results for the pre-regulation time frame. The G_INDEX is associated with forecast errors during the period prior to new regulations. In other words, firms that are classified as dictatorships have somewhat larger forecast errors. Consistent with this result, firms which have a joint CEO/Chairman of the Board, also have larger forecasts errors. These results suggest that firms that do not have corporate governance practices to protect investors create an information environment with more uncertainty. The most significant relationship between forecast errors and governance practices is the size of the board. In particular, as the board gets larger, analysts' forecast errors increase. This result is consistent with Jensen (1993) and Yermack (1996) who suggested that larger boards are less efficient and tend to follow the lead of the CEO. The control variables are fairly consistent with expectations in the pre-regulation period. As the multiple between market price and earnings becomes larger, the magnitude of analysts' forecast errors increases. As expected, forecast errors are larger for smaller firms, probably because there is less information available in the public domain. Finally, firms with losses are more difficult to forecast resulting in larger errors.

The results for the governance variables in the post-regulation era reveal a weaker association between governance and the quality of disclosure. The G_INDEX, an indicator of dictatorship or democracy, is not associated with forecast errors in the post-regulation period. Table 1 reported that significantly fewer firms had a combination CEO/Chairman of the Board role during the later time frame. The regression results indicate that this distinction is

¹¹ The number of observations in the standard deviation regression is slightly smaller as at least two analyst forecasts are necessary to calculate standard deviation.

¹² Variance inflation factors were computed for each regression and suggested that multicollinearity was not a problem.

Table 1 Descriptive statistics

Descriptive statistics for pre- and post-regulation periods								
Variables	Pre-regulation (2002–2004)			Post-regulation (2005–2008)			Difference	
	<i>N</i> = 1,101			<i>N</i> = 1,828			<i>t</i> test	Wilcoxon <i>Z</i>
	Mean	Median	SD	Mean	Median	SD		
Error/ <i>P</i> _{<i>i</i>}	2.018	0.849	3.053	1.344	0.591	2.605	−7.86***	−2.55***
SD/ <i>P</i> _{<i>i</i>}	0.479	0.195	0.902	0.396	0.185	0.759	−5.26**	−7.27***
G_INDEX _{<i>i</i>}	9.565	9.000	2.672	9.159	9.000	2.596	−0.56	−0.59
DUAL _{<i>i</i>}	0.356	0	0.479	0.176	0	0.381	−18.8***	−18.0***
B_SIZE	9.521	9.00	2.543	9.292	9.000	2.314	−1.43	−0.99
%IND	0.697	0.714	0.153	0.738	0.750	0.132	9.82***	9.11***
NUM _{<i>i</i>}	11.13	10.00	7.028	10.67	9.00	7.539	4.29**	4.13***
PE _{<i>i</i>}	21.46	17.22	106.59	23.95	17.90	96.67	1.88*	2.70***
LOG_SIZE _{<i>i</i>}	7.802	7.637	1.512	7.784	7.578	1.442	5.67***	5.78***
LOSS _{<i>i</i>}	0.091	0	0.287	0.044	0	0.204	−12.0***	−11.8***
EPSSTAB _{<i>i</i>}	47.82	30.00	52.37	47.99	29.00	55.00	0.90	1.77**

Variables are defined as follows: *Error/P_i* analyst forecast errors deflated by price × 100, *SD/P_i* standard deviation analyst forecast errors deflated by price × 100, *G_INDEX_i* Gompers governance index dummy 1 = dictatorship, 0 = democracy (median split), *DUAL_i* dummy variable that takes the value of 1 if CEO is chair of the board, *B_SIZE* number of members of the board of directors, *%IND* percent of board that is independent, *NUM_i* number of analysts following the firm, *PE_i* price to earnings ratio, *LOG_SIZE_i* log of market capitalization in millions of dollars, *LOSS_i* dummy variable which takes the value of 1 in year of loss, *EPSSTAB_i* I/B/E/S measure of earning stability

***, **, * reflect significance at the 0.01, 0.05, and 0.10, respectively, based on two-tailed tests

not significant in the post-regulation time frame. Finally, *B_SIZE*, which was significantly related to forecast errors in the pre-regulation period at the 1 % level is now only significant at the 10 % level.

The results for the control variables in the pre- and post-regulation periods are fairly consistent. Larger P/E ratios are associated with greater forecast errors in both time frames. Interestingly, while smaller firms tend to be associated with larger forecast errors in both time periods, the impact of size decreased significantly. This may be attributable to improvements in corporate governance in the post-regulation period that were applied more consistently across large and small firms. Loss firms in both time periods are associated with greater forecast errors. Finally, earnings stability, *EPSSTAB*, is more significantly related to forecast errors in the post-regulation period although the difference between the eras is not significant.

Overall, the analyses reported in Table 3 imply that varying levels of corporate governance do not result in variations in analysts' forecasts accuracy or dispersion in the post-regulation era. This suggests that variations in the strength of corporate governance had less of an impact on the quality of financial disclosure during this time period. A potential explanation for this result is that regulations were effective in establishing a sufficiently high level of corporate governance that improved consistency in the quality of financial disclosures. These standards resulted in enhanced disclosures and less variation in the quality of information.

This is consistent with the results by Bhat et al. (2006) who documented that variation in the levels of governance practices was more impactful in countries with less regulation. We believe that this result can be attributed to a more level playing field in post-regulation. As all public entities are required to maintain a certain level of controls, utilizing controls above and beyond the requirements does not significantly enhance the information environment of analysts.

Table 4 reports the differences between governance measures and forecast dispersion in the pre- and post-regulation periods. The *G_INDEX* and *DUAL* are not significantly related to forecast dispersion in either time period, although the sign of the coefficient changes between the two periods. Similar to the results for forecast errors, as the size of the board increases in the pre-regulation period, forecast dispersion increases. However, in the post-regulation era, the relationship between board size and forecast dispersion becomes less significant.

The relationship between the control variables and forecast dispersion does differ significantly between the pre- and post-regulation periods. In particular, the number of analysts following firms is not as significant in the post-regulation period. Also, the coefficient on size in the pre- and post-eras is different. As SOX and other regulations were implemented, the information environment for large and small firms appears to be more level. Somewhat surprisingly, the coefficient on loss firms increased significantly in the post period.

Table 2 Pearson correlations

	Error/P _i	SD/P _i	G_INDEX _i	DUAL _i	B_SIZE	%IND	NUM _i	PE _i	LOG_SIZE _i	LOSS _i	EPSSTAB _i
Error/P _i	•	0.467**	-0.045**	-0.028	-0.059***	0.014	-0.067***	0.126	-0.172***	0.324***	0.187***
SD/P _i	0.466***	•	-0.044*	-0.038	-0.046*	0.003	-0.034	-0.027	-0.160***	0.387***	0.175***
G_INDEX _i	-0.044*	-0.043*	•	0.039*	0.171***	0.122***	-0.109***	-0.034	0.032	-0.084*	-0.019
DUAL _i	-0.028	-0.003	0.040*	•	-0.023	-0.009***	-0.047***	-0.031	0.008	-0.033	-0.037
B_SIZE	-0.059***	-0.059***	0.171***	-0.024	•	0.128**	0.294	-0.027	0.458**	-0.176**	-0.113**
%IND	0.013	0.003	0.122***	0.092	0.114***	•	0.067***	-0.017	0.174***	-0.002	0.022
NUM _i	-0.067***	-0.034	-0.110***	-0.047**	0.249***	0.068	•	-0.037*	0.691***	-0.049**	-0.103***
PE _i	0.013	-0.027	-0.018	-0.031	-0.049**	-0.017	-0.036*	•	-0.484**	-0.252***	0.035
LOG_SIZE _i	-0.172***	-0.160***	0.032	0.008	0.493***	0.174***	0.669***	-0.048**	•	-0.156***	-0.181***
LOSS _i	0.324***	0.387***	-0.084	-0.033	-0.078***	0.002	-0.049**	-0.252***	-0.156***	•	0.037***
EPSSTAB _i	0.187***	0.174***	-0.019	-0.004	-0.049**	0.022	-0.103***	0.036	-0.18***	0.036	•

Variables defined in Table 1

Pearson correlations before (after) regulation are above (below) the diagonal
 ***, **, * indicate significance at <0.01, <0.05, and <0.10 respectively

Table 3 Regression analysis of cross-sectional relationship between aggregate corporate governance measures and forecast errors

	Predicted sign	Time period	
		Pre-regulation	Post-regulation
INT.	?	3.412 (4.85)***	1.759 (4.33)***
G_INDEX _i	+	0.360 (1.89)*	-0.066 (-0.66)
DUAL _i	+	0.367 (1.94)*	-0.091 (-0.71)
B_SIZE	?	0.139 (3.40)***	0.042 (1.72)*
%IND	-	0.268 (0.44)	0.410 (1.08)
NUM _i		0.013 (0.67)	0.019 (2.18)**
PE _i		0.004 (4.88)**	0.002 (5.42)***
LOG_SIZE _i		-0.532 (-5.48)***	-0.238 (-4.40)***
LOSS _i		6.592 (19.3)***	4.094 (15.2)***
EPSSTAB _i		0.002 (1.31)	0.006 (6.87)***
Adj R ²		0.3226	0.1634
Obs		1,101	1,828

Variables defined in Table 1

t statistics in parentheses. ***, **, * reflect significance at the 0.01, 0.05, and 0.10, respectively, based on two-tailed tests

Overall, our results seem to imply that there are differences in the importance of governance measures pre- and post-regulation. The new regulations may have altered the information environment of large and small firms as the relationship between firm size and both forecast errors and forecast dispersion changed significantly in the post-regulation era. The results suggest that differences in levels of corporate governance were important in the pre-regulation period. However, as Sarbanes–Oxley and exchange rules implemented more stringent corporate governance standards, the information environment appears to be more consistent. Thus, varying levels of corporate governance are no longer indicators of analysts’ forecast errors or dispersion.

Sensitivity Analysis

Measures of Governance

Recall that we base the results of the primary analysis in this paper on the dichotomous variable indicating the

Table 4 Regression analysis of cross-sectional relationship between aggregate corporate governance measures and forecast dispersion

	Predicted sign	Time period	
		Pre reg	Post reg
INT.	?	1.114 (5.96)***	0.714 (5.81)***
G_INDEX _i	+	0.018 (0.35)	-0.036 (-1.17)
DUAL _i	+	-0.031 (-0.59)	0.044 (1.14)
B_SIZE	?	0.037 (3.35)***	0.016 (2.19)**
%IND	-	0.106 (0.64)	0.089 (0.77)
NUM _i		0.024 (4.62)***	0.011 (4.06)***
PE _i		0.001 (2.54)**	0.001 (2.47)***
LOG_SIZE _i		-0.197 (-7.48)*	-0.101 (-6.15)***
LOSS _i		1.251 (13.3)***	1.350 (13.8)***
EPSSTAB _i		0.001 (2.61)	0.002 (6.42)***
Adj R ²		0.2370	0.1588
Obs		1,048	1,761

Variables defined in Table 1

t statistics in parentheses. ***, **, * reflect significance at the 0.01, 0.05 and 0.10, respectively, based on two-tailed tests

strength of corporate governance. Sivaramakrishnan et al. (2011) find that having adequate governance is significantly associated with the quality of earnings, exceeding an adequate level of governance may not affect the quality of earnings. To investigate the impact of adequate versus inadequate corporate governance, we re-estimated our models using various cutoffs for the G_INDEX variable. Results of this supplemental analysis are similar to those provided in the prior section of the paper. In addition, we estimate our results using a continuous measure of the strength of governance as defined by the Gompers Index. Consistent with the assertion by Sivaramakrishnan et al. (2011) the results using the continuous measure are slightly weaker than those reported in the tables.

Previous Fraud and Corporate Governance

Previous research finds a relation between previously committed fraud and effectiveness of corporate governance practices in overcoming the stigma (Farber 2005). Using a sample of firms that engaged in manipulation of financial

statements, Farber (2005) found that subsequent improvements in corporate governance are viewed with skepticism by market participants. To mitigate the potential effect of fraud on corporate governance practices, we re-evaluated our analysis using prior year's extreme negative returns as a proxy for past negative events such as fraud. Specifically, we exclude firms which experienced annual returns in the bottom decile and in the bottom quartile. The results of this analysis (untabulated) are unchanged from those reported in the body of this paper.

Regressions with Recent Data

As previously noted, our primary analysis is conducted using data from 2002 to 2008. We end our sample period in 2008 because The Corporate Library ceased including a key measure of corporate governance, the G_INDEX. As an additional analysis, we estimate regressions using data from 2009 to 2011 excluding the G_INDEX measure. Results of this analysis (untabulated) are similar to the results reported in the post-regulation period.

Ranked Regression

Some prior studies (e.g., Barron et al. 2002) that utilize forecast accuracy and dispersion as measures of disclosure quality employ ranked regression rather than OLS regression. We re-estimate our analysis using ranked regression. Results using ranked regression are qualitatively similar to those reported above and do not change the conclusions of our analysis.

Regressions with Single Corporate Governance Measure

In our main analysis, we include four proxies for the strength of corporate governance: G_INDEX, DUAL, B_SIZE and %IND. Correlations between governance proxies (reported in Table 2) and variance inflation factors (untabulated) computed in regressions do not suggest the presence of multicollinearity among governance measures. However, to insure that our results are not influenced by multicollinearity, we re-estimate our analysis reported in Tables 3 and 4 using one governance measure at a time. Results of this analysis (untabulated) are consistent with our prior analysis and our conclusions remain unchanged.

Alternative Cutoff for Pre- and Post-Regulation Periods

Some provisions of SOX and security market regulations took time to implement. Thus, it is possible that the effects of the changes in regulations were not fully realized in 2004. Thus, we re-perform our analysis using 2005 as the

cutoff date for the pre-post analysis rather than 2004. The results of this analysis (untabulated) are unchanged from those reported in the body of this paper.

Conclusion

SOX, NYSE Sec 303A, and NASDAQ Sec 4350 purport to improve corporate governance structures across all firms, resulting in a higher quality financial reporting environment. This goal is consistent with the aim of tightened regulations in other countries as well. For example, Beekes and Brown (2006, p. 423) state that two of the propositions contained in the enhanced statement of principles of the Australian Stock Exchange are that “better-governed firms make more timely and more ‘balanced’ disclosures of both good and bad news.”

As a result of enhanced governance regulations, there is likely less cross-sectional variation in corporate governance mechanisms in the post-regulation era. Presumably, the resulting regulations enhanced corporate governance policies in the areas most likely to compromise the quality of financial disclosures. Thus, firms that choose to exceed the prescribed standards after this time period may experience lower gains in disclosure quality. In such a setting, the relationship between corporate governance and financial statement quality, and hence analysts’ forecast characteristics, would diminish. This argument is supported by the research of Bhat et al. (2006) which reported that the quality of corporate governance disclosures had an impact on the accuracy of analysts’ forecasts, but that the relationship diminished as the strength of government enforcement is improved. This explanation is also consistent with the results of Sivaramakrishnan et al. (2011) that suggest that after reaching a threshold level for corporate governance, additional governance measures do not appear to result in stronger earnings.

Overall, our results imply that SOX and enhanced exchange rules resulted in more consistent disclosures post-regulation. Specifically, the research suggests that differences in levels of corporate governance were important determinants of the quality of disclosures in the pre-regulation period. However, as Sarbanes–Oxley and exchange rules implemented more stringent corporate governance standards, the information environment across firms became more consistent. Varying levels of corporate governance post-regulation do not predict analysts’ forecast errors or dispersion. Essentially, SOX and other regulations that increased corporate governance improved the quality of the information available for analysts and others.

The short-term impact of Sarbanes–Oxley and new exchange regulations appear to accomplish the desired impact. Stronger corporate governance is associated with

higher quality disclosures and decreased dispersion and errors in analysts’ forecasts. However, one significant unresolved issue is the long-term sustainability of SOX and the new exchange regulations. Begley et al. (2009) alluded to the possibility that the more stringent governance practices may have only had a short-term impact on the information environment. Past regulations seem to have a strong impact initially but fade as time passes. For example, stronger regulations were passed by the SEC in 1933 and 1934 following Black Tuesday. Expanded regulations for auditing procedures were passed in the late 1930s following the McKesson Robbins Scandal. More recently, peer review processes and divisions of firms were required after the Equity Funding and Continental Vending frauds during the 1970s. Despite these regulations, corporate scandals continue to occur across varying industries throughout time. Most recently, markets were shaken with subprime mortgage scandals that led to financial crisis in the U.S. and globally.

As markets are further removed from the implementation of SOX and the scandals leading to its implementation, it seems likely that organizations may comply with SOX superficially. According to He and Ho (2011), mere compliance with “expensive internal monitoring and control mechanisms may not necessarily bring substantial improvement to the effectiveness of the corporate governance system.” How can the SEC and other regulators work to maintain the impactful nature of SOX and other regulations? He and Ho (2011) suggest that corporate governance systems should not focus on implementing more stringent monitoring; instead, corporate governance systems should be primarily concerned with ethics education. Perhaps compliance with regulations like SOX in conjunction with strong ethics education can lead to organizations that continue to produce high quality disclosures which reflect the operating strategies and economic consequences of their activities.

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