

**THE ASSOCIATION OF AUDIT COMMITTEE OVERSIGHT WITH
FINANCIAL DISCLOSURE QUALITY**

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ABSTRACT

The Securities and Exchange Commission (SEC) and the Sarbanes-Oxley Act of 2002 suggest that the quality of financial disclosures is higher with effective audit committees. I investigate whether audit committees that meet the requirements of the Sarbanes-Oxley Act with respect to members' independence and financial expertise would be associated with higher disclosure quality through lower forecast dispersion, forecast errors, and revision volatility among analysts. I find lower forecast dispersion and revision volatility when all members of the audit committee are independent. Analysts' forecasts are more accurate when the audit committee is comprised completely of independent directors, where at least one member is a financial expert. Overall, the association I document between audit committees and the properties of analysts' forecasts suggests that efforts of the Sarbanes-Oxley Act to strengthen the effectiveness of corporate audit committees may be effective in enhancing the credibility and the timeliness of financial disclosures.

1. INTRODUCTION

This study examines the association between audit committee oversight and corporate disclosure quality. Corporate disclosure is one of the major concerns of regulatory authorities and standard-setting bodies in that the timeliness and the credibility of corporate disclosures are crucial to the evaluation of firm performance. Arthur Levitt, former Chairman of the Securities and Exchange Commission (SEC), emphasizes the importance of financial disclosure as follows:

[Q]uality information is the lifeblood of strong, vibrant markets. Without it, investor confidence erodes. Liquidity dries up. Fair and efficient markets simply cease to exist (Levitt 1999).

A common feature of those high-profile firms involved in the accounting scandals, however, is the failure of the board of directors to serve as a ‘watchdog’ for the shareholders.¹ The top executives of these firms allegedly concealed material information and reported misleading financial figures, but the boards of directors of these firms failed to detect the fraud and protect shareholders’ interests. This series of company failures, in part, led Congress to enact the Sarbanes-Oxley Act in 2002, in an effort to strengthen the effectiveness of corporate boards through improvements to the corporate audit committees. Following the Act, the New York Stock Exchange (NYSE) and NASDAQ have also approved new corporate governance rules that focus on strengthening the audit committee authority.

¹ For instance, Hamburger (2002) and Schroeder (2002) report that Senator Carl Levin (D., Michigan), Chairman of the Senate Permanent Subcommittee on Investigation, castigated five current and former directors of Enron for failing to act on numerous ‘red flags’ that should have prompted the board to halt alleged improper financial dealings that threatened Enron. “We think the [Enron] board fell asleep at the switch and fell down on the job”, said Senator Levin.

The underlying message from these regulation reforms is that the audit committee is a critical internal control mechanism and the gatekeeper of financial information that shareholders and investors rely upon in making investment decisions. As a result, audit committees, through effectively overseeing the internal control process and interacting with external auditors and financial managers, should increase the credibility of financial disclosure.

While the responsibilities of the audit committee specified by the SEC focus primarily on the process of mandatory financial reporting, the influence of the audit committee is likely to extend to managers' voluntary disclosures. The New York Stock Exchange (NYSE) requires audit committees to discuss disclosures in the company's Management Discussion and Analysis (MD&A), earnings press releases, as well as earnings guidance provided to financial analysts and rating agencies [NYSE Listed Company Manual, Section 303A.07(B) and (C)]. Further, Healy and Palepu (2001) and Lundholm (1999, 2003) argue that mandatory financial reports serve as a mechanism that enhances the credibility of managers' voluntary disclosures. More recently, Karamanou and Vafeas (2005) find that effective corporate governance is related to the likelihood, the precision, and the accuracy of management earnings forecasts.

While concentrating on management forecasts is advantageous in some way, Karamanou and Vafeas (2005) ignore other forms of voluntary disclosures, e.g. conference calls and press release. Further, the relation between the audit committee attributes and management forecasts is somewhat weak, partly because the authors do not consider fully the monitoring function that audit committees serve in the financial reporting and information disclosing process. Also, the timeliness of financial

disclosures is not addressed. Only when the information about a firm is both timely and credible is it useful for investors and other market participants to make informed decisions so that fair and efficient markets can be maintained. In this study, therefore, I provide more evidence by investigating the association of audit committee with financial disclosure quality, including the credibility and the timeliness of disclosures.

To examine the relation between audit committees and disclosure quality, I focus on two audit committee attributes identified in the Sarbanes-Oxley Act: independence and the presence of a financial expert. The Blue Ribbon Committee (BRC), in a report that recommends strengthening the effectiveness of audit committees, states that independence is the above all other characteristics of audit committees (BRC 1999). Thus I expect this attribute to be more likely related to disclosure quality. Further, I measure disclosure quality as reflected in the properties of analyst forecasts for the following reasons. Financial analysts are the primary users of financial information and important information intermediaries. Lang and Lundholm (1996) suggest that the dispersion and the accuracy of analysts' forecasts are associated with the informativeness of firm-provided disclosures while the volatility of forecast revisions is likely reduced with more timely disclosures. If audit committees, therefore, are related to the credibility and the timeliness of financial disclosure, the properties of analysts' forecasts are likely related to the audit committee attributes.

In addition, other studies have provided evidence on the association of different forms of disclosures with the properties of analysts' forecasts: MD&A (Barron et al., 1999), conference calls (Bowen et al., 2002), disclosure quantity in annual reports (Hope, 2003a), and accounting policy disclosures (Hope, 2003b). Collectively, these studies

suggest that analysts respond to firms' financial disclosures and that analysts' forecasts reflect the quality of disclosures, including mandatory and voluntary ones.

Consistent with the predictions, firms exhibit lower forecast dispersion, greater forecast accuracy, and revision volatility when audit committees are comprised completely of independent directors. Further, analysts' forecasts are more accurate when a financial expert is appointed to the audit committee. These results are robust after controlling for other factors that likely influence the audit committee oversight and analysts' forecasts. Also, the results are not sensitive to an alternative definition of the financial expert and the possible cross-sectional interdependence.

This study complements prior studies by demonstrating an association between audit committees and the credibility and the timeliness of financial disclosure as reflected in the properties of analysts' forecasts, further suggesting that mandated changes in corporate oversight by the SEC and Congress may improve firms' disclosure quality and restore investor confidence in capital markets.

The remainder of this study is organized as follows. Section two discusses research design and hypotheses. Section three presents the empirical results. Section four conducts sensitivity tests and section five concludes the study.

2. RESEARCH DESIGN AND HYPOTHESIS DEVELOPMENT

2.1 Hypothesis Development

Prior literature documents significant associations between disclosure practices and the properties of analyst forecasts—dispersion, accuracy, and volatility of forecast revisions. Using these associations, I examine whether audit committees with attributes

specified in the Sarbanes-Oxley Act are also associated with higher disclosure quality as reflected in lower forecast dispersion, forecast errors, and volatility of forecast revisions. The Sarbanes-Oxley Act calls for audit committees to be completely comprised of independent directors, where at least one member is a financial expert.

With respect to audit committee independence, the Act specifies that in order to be considered independent, a member of an audit committee may not, other than in his or her capacity as a director, (i) accept any consulting, advisory, or other compensatory fee from the firm; or (ii) be an affiliated person of the firm or its subsidiary. Following this requirement, a director is classified as *not independent* if he or she: (1) was a former employee of the firm; (2) is a relative of the firm's executives; (3) is an interlocking director; (4) has significant transactions or business relationships with the firm; or (5) provides legal, consulting and underwriting services to the firm.

On the other hand, the definition of financial expertise involves a great deal of controversy. In the Proposed Rule issued in October 2002 that implements the Act,² the SEC adopted a definition of financial expertise that focuses primarily on whether a director has accounting-related expertise. As a result, a director is classified as a financial expert if that director has experience as a public accountant or auditor, a principal financial officer, comptroller, principal accounting officer, or experience in a position involving the performance of similar functions. Critics, however, argued that this narrowly defined financial expertise is unnecessarily restrictive and limits the pool of qualified directors. The financial press also questioned the narrower definition of

² According to the *Sarbanes-Oxley Act*, an individual identified as a "financial expert" should have, through education and work experience, (i) an understanding of GAAP and financial statements; (ii) experience in preparing or auditing financial statements and in applying GAAP in connection with the accounting for estimates, accruals, and reserves; (iii) experience with internal accounting controls; and (iv) an understanding of audit committee functions.

financial expertise. To respond to the intense criticism, in the Final Rule the SEC expanded the definition to classify a director that has experience in supervising finance or accounting personnel as a financial expert (SEC 2003). With the broader definition, the CEO of the firm is qualified as a financial expert. For the tests in this study, I adopt the definition of financial expertise in the SEC Final Rule. I also test later on whether the results are sensitive to the definition of financial expertise, since Defond et al. (2005) find that market reacts more favorably to the appointment of *accounting* financial experts to the audit committee than to the appointment of *non-accounting* financial experts.

I create two dummy (0,1) indicator variables to represent the required level for audit committee independence (IND_t) and the presence of at least one financial expert on the audit committee ($EXPERT_t$). Further, I include in the model four variables representing other factors that the prior literature suggests could influence the oversight of audit committees. The first two variables capture the CEO's influence on the board and the monitoring function that an independent large blockholder serves. These variables are set to one when the CEO does not serve both as the Chairman of the Board and as a member on the nominating committee ($NOINF_t$) (Dechow et al., 1996; Shivdasani and Yermack, 1999), and when an independent large blockholder serves on the audit committee ($BLOCK_t$) (Klein 2002a, b). Otherwise these variables are zero. The other two variables are the proportion of independent directors on the board ($BODIND_t$) (Klein, 2002a, Karamanou and Vafeas, 2005) and the stock ownership of the CEO ($CEOSHR_t$) (Warfield et al., 1995; Klein, 2002a),

In addition to the factors I include to control for other influences into the oversight of audit committees, I also include additional control variables that the prior

literature has identified as potentially influencing corporate disclosure and analysts' forecasts. I include earnings persistence ($PERS_t$) and stock return volatility ($VOLA_t$) to control for the variability of firm performance that might influence managers' incentives to disclose information, thus may affect analysts' forecasts (Lang and Lundholm, 1993).³ Two additional control variables identified in Lang and Lundholm (1993, 1996), analyst prior year's forecast accuracy ($ACCU_{t-1}$) and the percentage of new forecasts ($NEWFORE_t$), are included in the analysis.⁴ Inclusion of the prior year's forecast accuracy controls for the fact that forecast properties are likely affected by the magnitude of the earnings information to be disclosed. The percentage of new forecasts is included to mitigate the possible effect of stale I/B/E/S forecasts. The last group of control variables I include in the analysis captures mainly the information environment facing analysts: analyst following ($FOLLOW_t$) (Lang and Lundholm, 1996; Barron et al., 1998), negative losses ($LOSS_t$) (Hwang et al., 1996; Brown, 2001), and firm size ($SIZE_t$) (Atiase, 1985).

As in Lang and Lundholm (1996), since a particular functional form may not exist for the relation between the properties of analyst forecasts and audit committee attributes, I used ranked data. Another merit of using ranked data is to mitigate the potential effect of extreme observations. I rank the dependent and independent variables within their industry-year, except for the indicator variables, and then convert the ranks into

³ The use of standard deviation of ROE (Lang and Lundholm, 1996) instead of earnings persistence as the proxy for earnings variability does not alter the results in any material way.

⁴ Lang and Lundholm (1996) include the returns-earnings correlation as another control variable, which is omitted in my tests. If the audit committee, through its primary function of monitoring the financial reporting process, enhances earnings quality (through a higher returns-earnings relation as shown in Bryan et al., 2005) and disclosure quality, inclusion of the returns-earnings correlation in the tests could mask the results.

percentiles: (rank-1) / (number of firms-1). With this procedure, the lowest-ranking firm receives a zero and the highest-ranking firm receives a one.

The models that test the association between the audit committee attributes and disclosure quality reflected in the properties of analyst forecasts are thus as follows:

$$\begin{aligned}
 DISPER_t = & \alpha_0 + \alpha_1 IND_t + \alpha_2 EXPERT_t + \alpha_3 BODIND_t + \alpha_4 NOINF_t + \alpha_5 BLOCK_t \\
 & + \alpha_6 CEOSHR_t + \alpha_7 PERS_t + \alpha_8 VOLA_{t-1} + \alpha_9 ACCU_{t-1} \\
 & + \alpha_{10} NEWFORE_t + \alpha_{11} FOLLOW_t + \alpha_{12} LOSS_t + \alpha_{13} SIZE_t + \varepsilon_t
 \end{aligned} \tag{1}$$

$$\begin{aligned}
 ACCU_t = & \beta_0 + \beta_1 IND_t + \beta_2 EXPERT_t + \beta_3 BODIND_t + \beta_4 NOINF_t + \beta_5 BLOCK_t \\
 & + \beta_6 CEOSHR_t + \beta_7 PERS_t + \beta_8 VOLA_{t-1} + \beta_9 ACCU_{t-1} \\
 & + \beta_{10} NEWFORE_t + \beta_{11} FOLLOW_t + \beta_{12} LOSS_t + \beta_{13} SIZE_t + \xi_t
 \end{aligned} \tag{2}$$

$$\begin{aligned}
 STDREV_t = & \gamma_0 + \gamma_1 IND_t + \gamma_2 EXPERT_t + \gamma_3 BODIND_t + \gamma_4 NOINF_t + \gamma_5 BLOCK_t \\
 & + \gamma_6 CEOSHR_t + \gamma_7 PERS_t + \gamma_8 VOLA_{t-1} + \gamma_9 ACCU_{t-1} \\
 & + \gamma_{10} NEWFORE_t + \gamma_{11} FOLLOW_t + \gamma_{12} LOSS_t + \gamma_{13} SIZE_t + \eta_t
 \end{aligned} \tag{3}$$

All variables are defined as follows:

- DISPER_t = standard deviation of analyst forecasts of earnings for the fiscal year, averaged over the twelve months of the fiscal year and scaled by the beginning-of-the year stock price;
- ACCU_t = the absolute value of the difference between median forecast of earnings and actual earnings, averaged over the twelve months of the fiscal year and scaled by the beginning-of-the year stock price;
- STDREV_t = standard deviation of the forecast changes over the fiscal year in the median earnings forecast from the preceding month, scaled by the beginning-of-the year stock price;
- IND_t = indicator variable set to 1 if the audit committee is completely comprised of independent directors, otherwise 0;
- EXPERT_t = indicator variable set to 1 if the audit committee employs at least one financial expert, otherwise 0;

BODIND _t	=	percentage of independent directors on the board;
NOINF _t	=	indicator variable set to 1 if the CEO does not serve as the Chairman of the Board and serves on the nominating committee, otherwise 0;
BLOCK _t	=	indicator variable set to 1 if an independent large blockholder (five percent or more) serves on the audit committee, otherwise 0;
CEOSHR _t	=	percentage of a firm's common stock owned by the CEO, including those stock options 'in the money' exercisable within 60 days;
PERS _t	=	earnings persistence at the beginning of the year measured over an eight year period;
VOLA _{t-1}	=	standard deviation of daily stock returns for fiscal year t-1;
ACCU _{t-1}	=	the negative of the absolute value of the difference between actual earnings per share and most recent median forecast of earnings per share for fiscal year t-1;
NEWFORE _t	=	number of forecasts revised during the month divided by the number of forecasts, averaged over the twelve months of the fiscal year;
FOLLOW _t	=	number of analysts providing an annual earnings forecast as of the beginning of the year;
LOSS _t	=	indicator variable set to 1 if the firm reports a loss for the year, otherwise 0; and
SIZE _t	=	market value of equity in billions at the beginning of the year.

Since the focus of the study is general disclosure quality, not the disclosure practices surrounding a particular event (e.g. equity issuance), forecast dispersion and forecast accuracy are averaged over the twelve months of the fiscal year.⁵ Further, due to the audit committee's ongoing role throughout the year, averaged measures of forecast properties likely better capture the association with the audit committee over the entire year.

If the audit committee attributes specified in the Sarbanes-Oxley Act are related to disclosure quality, then I would expect lower forecast dispersion, forecast error, and

⁵ Lang and Lundholm (1996) adopt a similar approach in examining the association between disclosure quality and the properties of analyst forecasts.

revision volatility for firms employing independent audit committees with at least one financial expert serving on the committee. Formally, these hypotheses (in alternative form) are stated below:

H1: Firms employing audit committees comprised of independent directors and at least one financial expert exhibit lower forecast dispersion ($\alpha_1 < 0$; $\alpha_2 < 0$).

H2: Firms employing audit committees comprised of independent directors and at least one financial expert exhibit greater forecast accuracy ($\beta_1 > 0$; $\beta_2 > 0$).

H3: Firms employing audit committees comprised of independent directors and at least one financial expert exhibit lower revision volatility ($\gamma_1 < 0$; $\gamma_2 < 0$).

2.2 Sample Selection

The initial sample consists of audit committee data for firms listed on the 1996 Fortune 500, over the period 1996 to 2000. Of the possible 2,500 firm-years, I deleted those firm-years from financial institutions and utility industries, reducing the sample by 460 firm-years and 205 firm-years, respectively. I deleted these observations from the sample since these are from regulated industries such that governmental auditors, compliance officers, and others also oversee the financial reporting process, beyond the oversight performed by the board or the audit committee.

Over the sample period, these selection criteria yielded 1,835 firm-years. To be included in the final sample, each firm-year had to have sufficient data for the hypothesis tests. I thus required proxy data on a firm's audit committee, including its members' affiliations and background. Data on CEO shareholdings and large blockholders were also required. As detailed in Table 1, these selection criteria resulted in the loss of 339

firm-years, primarily due to mergers. Further, I lost 17 observations for missing stock price and return data from *CRSP*.

Insert Table 1 Here

Analyst forecast data are drawn from the I/B/E/S Summary database. To compute the properties of analyst forecasts, I required analyst forecast data for the prior year and current year. I also required the number of analysts that provide earnings forecasts for the sample firms as well as the number of forecasts revised. These criteria together resulted in a loss of 34 observations. I further eliminated 11 observations for which fewer than three analysts provide earnings forecasts.

From *Compustat*, I required income before extraordinary items (data #18) for the prior eight years to estimate earnings persistence. This time-series requirement further resulted in a loss of 161 observations. The final sample for the tests, therefore, is 1,273 observations.

2.3 Descriptive Statistics

Table 2, Panel A presents descriptive statistics of the data. Panel B presents the sample partitioned by audit committee attributes, and the tests of the mean difference across subgroups.

Insert Table 2 Here

Of the full sample, about 61% of the audit committees are comprised completely of independent directors, and 78.9% of the audit committees have at least one financial expert. When the sample is partitioned on whether the audit committee is comprised completely of independent directors (henceforth, 100% independent group) or comprised of at least one director directly or indirectly affiliated to the company (henceforth, <100% independent group), I find no significant differences in the appointment of a financial expert across the 100% and <100% independent groups.

Further, more independent directors serve on the board for the 100% group than for the <100% group. Also, a firm is more likely to have an audit committee comprised solely of independent directors when its CEO is less influential over the board. Finally, about 5.7% of the audit committees have an independent large blockholder serve on the committee when at least one of other members is classified as *not independent*, significantly different from 2% when the audit committee is completely independent. These relations warrant the inclusion of the factors that might influence the composition of the audit committee.

When the sample is partitioned on whether there is a financial expert on the audit committee or not, no significant relation exists between audit committee independence and the appointment of a financial expert. Further, similar to the partitioning on audit committee independence, the proportion of independent directors on the board and percentage of non-influential CEOs are greater when a financial expert serves on the audit committee. In addition, the appointment of an independent large blockholder to the audit committee and the stock ownership of the CEOs seem to substitute for the

appointment of a financial expert as these two variables are significantly different across the subgroups.

Finally, with respect to the properties of analysts' forecasts, forecast dispersion and revision volatility differ marginally across subgroups when the sample is partitioned on the appointment of a financial expert. No significant difference in forecast errors, on the other hand, exists across subgroups regardless of the partitioning attributes. Given the associations of audit committee attributes with all other variables, however, it is premature to draw any conclusion as to the relation of the audit committee to the properties of analysts' forecasts from these univariate correlations. The next section presents the results of multiple regression analyses.

Table 3 further presents the correlations between the properties of analysts' forecasts and the control variables. In general, not only do the properties of analysts' forecasts significantly relate to the control variables, but significant interrelations exist among the control variables. The direction of interrelations is also consistent with the prior studies. Collectively, significant associations of these variables with analysts' forecasts and audit committee attributes warrant their inclusion in the tests.

Insert Table 3 Here

3. EMPIRICAL RESULTS

3.1 Results for Forecast Dispersion

Table 4 presents the results for the test of forecast dispersion. The results for testing each attribute alone as well as the three attributes jointly are presented.

Insert Table 4 Here

The coefficient on IND_t is significantly negative (-0.042; p-value < 0.01) in the independence model, and remains significant in the joint model (-0.042; p-value < 0.01), suggesting that audit committees comprised completely of independent directors are associated with lower forecast dispersion. On the other hand, the coefficient on $EXPERT_t$ is insignificant. A significant relation between audit committee independence and forecast dispersion among analysts supports the view the BRC holds that independence of the audit committee is of greater importance than other characteristics.

Regarding the factors that may influence the audit committee oversight, the coefficients on $BLOCK_t$ are marginally significant in both the independence and joint model (-0.056; p-value < 0.1), consistent with the conjecture that an independent large blockholder may substitute for the audit committee independence. On the other hand, a significant negative association between forecast dispersion and CEO stock ownership across all models is consistent with the idea that the CEO with higher stock ownership is likely to reduce agency cost (Warfield et al., 1995) and to have more incentives to disclose information.

With respect to firm characteristics associated with the properties of analysts' forecasts, except for analyst following, the direction of the association is as predicted. The positive relation between forecast dispersion and analyst following may be attributed to the fact that analyst following is highly correlated with the firm size (0.714 from Table 3).

3.2 Results for Forecast Accuracy

Table 5 presents the results for forecast accuracy. Unlike to the test of forecast dispersion, both the coefficients on IND_t and $EXPERT_t$ are significantly positive when being tested independently and jointly (0.024, p-value <0.05; 0.027, p-value<0.1 respectively), suggesting that audit committees comprised completely of independent directors with a financial expert serving on the committee are positively related to forecast accuracy of analysts. Further, the rise in the coefficients on IND_t and $EXPERT_t$ in the joint model suggests some synergy between the two attributes.

Insert Table 5 Here

On the other hand, none of the factors that may influence the monitoring of audit committees are significantly associated with forecast accuracy. Other firm characteristics documented in the prior literature remain significantly related to forecast accuracy as predicted.

3.3 Results for Revision Volatility

Table 6 reports the results for revision volatility. As indicated in Lang and Lundholm (1996), this measure captures the timeliness of corporate disclosure. If managers disclose material information on an ongoing basis, the volatility in analysts' forecast revision is likely to be lower than if managers opt to withhold information and disclose all at once.

Insert Table 6 Here

Consistent with the prediction, the coefficients on IND_t (-0.045 and 0-0.047 respectively, p-values < 0.01) remain significantly negative with comparable magnitude when tested independently or jointly with $EXPERT_t$. The coefficient on $EXPERT_t$, on the other hand, is insignificant in any model. This suggests that firms employing independent audit committees are more likely to disclose information in a more timely fashion.

Collectively, the results presented in Table 4 through Table 6 indicate that audit committees comprised completely of independent directors are negatively associated with forecast dispersion and revision volatility, and positively associated with forecast accuracy. On the other hand, the appointment of a financial expert is related neither to forecast dispersion nor to revision volatility, but marginally related to forecast accuracy. A possible explanation may be attributed to the role of the financial expert in the information disclosing process. The financial expert on the audit committee may play a

major role in ensuring the credibility of financial information, while other independent directors on the committee may induce more timely disclosures.

4. SENSITIVITY TESTS

4.1 Alternative Definition of Financial Expertise

While the SEC adopts a broader definition of an “audit committee financial expert” in the Final Rule that implements Section 407 of the Sarbanes-Oxley Act, the controversy over the definition of financial expertise still remains. In particular, the finding by Defond et al. (2005) that the market reacts positively to the appointment of accounting financial experts to the audit committee, but does not react significantly to that of non-accounting financial experts seems inconsistent with the criticism against the financial expertise defined in the Proposed Rule that emphasizes on *accounting-related experience* with a public firm filing reports with the SEC. Therefore, I perform a sensitivity test using the definition of financial expertise that concentrates primarily on accounting-related expertise. With this narrower definition, the CEO of a public firm is not identified as a financial expert.

Of the entire sample, only about 25.8% of firms appoint an accounting expert to the audit committee, compared to 78.9% when the financial expert is broadly defined. Further, when the sample is partitioned on the audit committee independence, 27.2% of the firms have an accounting expert for the 100% independent group, compared to 23.6% for the <100% independent group.

When I retest the association with forecast dispersion and revision volatility using the narrower definition, the results (untabulated) remain substantially the same.

Nonetheless, the relation between forecast accuracy and the appointment of an accounting expert becomes stronger. Specifically, the coefficient on $EXPERT_t$ is 0.030 and 0.031 (p-values < 0.05) when tested independently and jointly with IND_t , rising from 0.024 and 0.027 (see Table 5) when the broader definition is used. The results on IND_t remain similar.

In all, the results are not sensitive to the difference in the definition of financial expertise. However, a stronger association between the accounting expert and forecast accuracy suggests that firms, when appointing an accounting expert to the audit committee, may further enhance the credibility of financial disclosures.

4.2 Year-by-Year Tests

The results for the tests are based on pooled data across the five-year sample period (1996-2000). To mitigate the possible cross-sectional interdependence, I estimate the test regressions by year and average the five year-by-year coefficients. I also pool the five year-by-year standard deviations in order to calculate the t-statistics that determine the level of significance.

When I retest the association of the audit committee attributes with forecast dispersion, forecast accuracy, and revision volatility, the average of the coefficients on IND_t across the five years in the joint model is -0.041, 0.028, and -0.051 respectively (all p-values < 0.01). The average of the coefficients on $EXPERT_t$ across the five years is 0.025 (p-value < 0.1) for the test of forecast accuracy, and remain insignificant for the tests of forecast dispersion and revision volatility.

In sum, the tests using the 5-year pooled data or the by-year data yield similar results, suggesting that the results are not sensitive to the possible cross-sectional interdependence and that audit committees comprised of independent directors with a financial expert exhibit higher disclosure quality as reflected in the properties of analyst forecasts.

5. CONCLUSION

Motivated by recent regulations, this study provides evidence on the association between audit committee oversight and financial disclosure quality as reflected in the properties of analysts' forecasts. Prior literature argues that mandatory financial reports serve as a mechanism to encourage more timely and credible voluntary disclosures. Given the primary responsibility of audit committees for monitoring the financial reporting and the information disclosing process, I posit that the overall quality of financial disclosures is greater with effective audit committees.

Using the properties of analysts' forecasts that reflect financial disclosure quality, I demonstrate that forecast dispersion and revision volatility are lower when audit committees are comprised completely of independent directors. Further, analysts make more accurate earnings forecasts when a financial expert serves on the completely independent audit committee.

These results are robust to inclusion of other factors that could influence the audit committee's oversight, such as CEO influence, CEO shareholdings and an independent large blockholder serving on the audit committee, as well as other factors that prior literature identifies as being likely to influence analysts' forecasts. Also, using an

alternative definition of financial expertise and the year-by-year regressions do not alter the results in any material way. Overall, these results provide evidence suggesting that effective audit committees are related to the quality of financial disclosure, lending support for moves by the SEC and Congress to strengthen the effectiveness of corporate audit committees through requiring complete independence and the appointment of a financial expert to the committee.

One limitation of the study is that the sample is restricted to large firms. While the sample is comparable to other audit committee studies, such as Klein (2002a, 2002b), and disclosure quality studies, such as Lang and Lundholm (1996), the results may not be generalizable to smaller firms. Future research may be able to identify whether the high level of public scrutiny common with larger firms affects the relation between audit committee oversight and corporate disclosure quality.

There are also some other potential avenues for future research. First, is the audit committee, through more scrutiny on the financial reporting and managers' disclosure, related to managers' incentives to release good news and bad news? Second, it is interesting to examine how the structure of directors' compensation, recent changes in regulations, and rising liability imposed on the corporate board and the audit committee might influence the willingness and incentives of audit committee members to serve as the watchdog for the shareholders. Finally, studies that examine the conformity of recent regulations can provide further evidence on the impact and effectiveness of the regulations. For instance, research may investigate whether, subsequent to the regulations, the audit committee becomes more conservative, possibly leading to more conservative financial reporting and corporate disclosure policy.

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TABLE 1
Sample Selection and Screening Procedures

	Observations
Initial Sample of Fortune 500 firms, 1996	500
Possible firm-years: 1996-2000	2,500
Less firm-years:	
from banking industry	460
from utility industry	205
Subtotal	1,835
Less firm-years:	
Missing data on audit committee due to mergers	339
Missing data on <i>CRSP</i>	17
Missing data on <i>IBES</i>	34
Fewer than three analyst forecasts	11
Missing data on <i>Compustat</i>	161
Total firm-years in final sample	1,273

TABLE 2
Sample Descriptive Statistics

Panel A: Firm Characteristics

(Summarized as means of firm-years)

Variable	Mean	Median	Standard Deviation
% Firms with an Independent Audit Committee	0.611	1.000	0.488
% Audit Committee with a Financial Expert	0.789	1.000	0.408
% Independent Directors	0.700	0.727	0.146
% Non Influential CEOs	0.749	1.000	0.434
% Blockholder on Audit Committee	0.035	0.000	0.185
CEO Stock Ownership %	0.023	0.005	0.067
Forecast Dispersion	0.004	0.002	0.007
Forecast Errors	0.011	0.004	0.033
Revision Volatility	0.003	0.001	0.007
Earnings Persistence	0.440	0.437	0.561
Stock Returns Volatility	0.021	0.019	0.008
% of New Forecasts	0.307	0.297	0.117
Number of Analyst Following	17.909	16.667	8.088
% Loss Firms	0.036	0.000	0.187
Firm Size	18.416	6.008	37.544

TABLE 2: CONTINUED

Panel B: Descriptive Statistics Partitioned by Audit Committee Attributes

Variable	AC Independence			Financial Expert		
	100% n=778	<100% n=495	Diff.	Yes n=1004	No n=269	Diff.
% Firms with an Independent Audit Committee	-	-	-	0.615	0.599	0.016
% Audit Committees with a Financial Expert	0.793	0.782	0.011	-	-	-
% Independent Directors	0.751	0.619	0.132 ***	0.721	0.621	0.100 ***
% Non Influential CEOs	0.796	0.675	0.121 ***	0.774	0.654	0.120 ***
% Blockholder on Committee	0.022	0.057	-0.035 ***	0.027	0.067	-0.040 ***
CEO Stock Ownership %	0.020	0.027	-0.007	0.019	0.036	-0.017 ***
Forecast Dispersion	0.004	0.004	0.000	0.004	0.005	-0.001 *
Forecast Errors	0.011	0.010	0.001	0.010	0.014	-0.004
Revision Volatility	0.003	0.003	0.000	0.003	0.004	-0.001 *
Earnings Persistence	0.415	0.478	-0.062 **	0.434	0.462	-0.029
Stock Return Volatility	0.022	0.020	0.002 ***	0.021	0.022	-0.002 ***
% of New Forecasts	0.308	0.306	0.002	0.305	0.314	-0.008
Number of Analyst Following	17.478	18.588	-1.111 ***	18.114	17.146	0.968 *
% Loss Firms	0.039	0.032	0.006	0.036	0.037	-0.001
Firm Size	16.638	21.212	-4.574 **	18.988	16.283	2.705

Notes:

*, ** and *** signify two-tailed significance at the 0.10, 0.05 and 0.01 level.

The variables are defined as follows:

% Firms with an Independent Audit Committee = percentage of audit committees that are completely comprised of independent directors;

% Audit Committees with a Financial Expert = percentage of audit committees that employ at least one financial expert;

% Independent Directors = percentage of independent directors on the board;

% Non Influential CEOs = percentage of firms without influential CEOs, which is an indicator variable set to 1 if the CEO does not serve as the Chairman of the Board and serves on the nominating committee;

% Blockholder on Committee	=	percentage of firms with an independent large blockholder on audit committee;
CEO Stock Ownership %	=	percentage of a firm's common stock owned by the CEO, including those stock options 'in the money' exercisable within 60 days;
Forecast Dispersion	=	standard deviation of analyst forecasts of earnings for the fiscal year, averaged over the twelve months of the fiscal year and scaled by the beginning-of-the year stock price;
Forecast Errors	=	the absolute value of the difference between median forecast of earnings and actual earnings, averaged over the twelve months of the fiscal year and scaled by the beginning-of-the year stock price;
Revision Volatility	=	standard deviation of the forecast changes over the fiscal year in the median earnings forecast from the preceding month, scaled by the beginning-of-the year stock price;
Earnings Persistence	=	earnings persistence at the beginning of the year, measured over an eight year period;
Stock Return Volatility	=	standard deviation of daily stock returns for fiscal year t-1;
% of New Forecasts	=	the number of forecasts revised during the month divided by the number of forecasts, averaged over the twelve months of the fiscal year;
Number of Analyst Following	=	the number of analysts providing an annual earnings forecast as of the beginning of the year;
% Loss Firms	=	percentage of loss firms; and
Firm Size	=	market value of equity in billions at the beginning of the year.

TABLE 3
Spearman Correlations between the Properties of Analysts' Forecasts and the Control Variables

	Dependent Variables			Control Variables			
	DISPER	ACCU _t	STDREV	BODIND	NOINF	BLOCK	CEOSHR
DISPER							
ACCU_t	-0.710 0.0001						
STDREV	0.779 0.0001	-0.821 0.0001					
BODIND	0.028 0.3114	-0.019 0.5004	0.016 0.5718				
NOINF	-0.026 0.355	0.010 0.7199	-0.021 0.4460	0.188 0.0001			
BLOCK	-0.093 0.0009	0.089 0.0014	-0.102 0.0003	-0.069 0.0135	-0.066 0.0193		
CEOSHR	0.165 0.0001	-0.156 0.0001	0.178 0.0001	-0.185 0.0001	-0.271 0.0001	-0.029 0.2990	
PERS	-0.230 0.0001	0.163 0.0001	-0.166 0.0001	-0.084 0.0028	-0.043 0.1219	0.077 0.0059	-0.075 0.0077
VOLA	0.394 0.0001	-0.361 0.0001	0.387 0.0001	-0.045 0.1055	-0.054 0.0522	-0.044 0.1160	0.199 0.0001
ACCU_{t-1}	-0.507 0.0001	0.404 0.0001	-0.435 0.0001	-0.020 0.4727	-0.010 0.7319	0.064 0.0230	-0.104 0.0002
NEWFORE	0.536 0.0001	-0.651 0.0001	0.649 0.0001	-0.009 0.7443	0.041 0.1466	-0.079 0.0046	0.073 0.0087
FOLLOW	-0.254 0.0001	0.203 0.0001	-0.263 0.0001	-0.013 0.6464	0.183 0.0001	-0.021 0.4487	-0.297 0.0001
LOSS	0.259 0.0001	-0.224 0.0001	0.234 0.0001	-0.008 0.7706	-0.024 0.3993	-0.014 0.6110	0.082 0.0034
SIZE	-0.497 0.0001	0.363 0.0001	-0.418 0.0001	-0.023 0.4112	0.162 0.0001	0.010 0.7208	-0.418 0.0001

TABLE 3: CONTINUED

	Control Variables						
	PERS	VOLA	ACCU _{t-1}	NEWFORE	FOLLOW	LOSS	SIZE
PERS							
VOLA	-0.052 0.0657						
ACCU_{t-1}	0.161 0.0001	-0.255 0.0001					
NEWFORE	-0.024 0.3856	0.257 0.0001	-0.279 0.0001				
FOLLOW	0.151 0.0001	-0.082 0.0032	0.171 0.0001	0.021 0.4435			
LOSS	-0.111 0.0001	0.169 0.0001	-0.172 0.0001	0.145 0.0001	-0.070 0.0125		
SIZE	0.195 0.0001	-0.307 0.0001	0.307 0.0001	-0.124 0.0001	0.714 0.0001	-0.155 0.0001	

Notes:

All variables, except for the indicator variables (IND, EXPERT, NOINF, BLOCK, and LOSS), are computed by ranking the unranked variables in Table 2 within their industry-year converting the ranks to percentiles: $(\text{rank}-1)/(\text{number of firms}-1)$. List below each correlation is the p value.

The variables are defined as follows:

- DISPER = standard deviation of analyst forecasts of earnings for the fiscal year, averaged over the twelve months of the fiscal year and scaled by the beginning-of-the year stock price;
- ACCU_t = the absolute value of the difference between median forecast of earnings and actual earnings, averaged over the twelve months of the fiscal year and scaled by the beginning-of-the year stock price;
- STDREV = standard deviation of the forecast changes over the fiscal year in the median earnings forecast from the preceding month, scaled by the beginning-of-the year stock price;
- IND = indicator variable set to 1 if the audit committee is completely comprised of independent directors, otherwise 0;

EXPERT	= indicator variable set to 1 if the audit committee employs at least one financial expert, otherwise 0;
BODIND	= percentage of independent directors on the board;
NOINF	= indicator variable set to 1 if the CEO does not serve as the Chairman of the Board and serves on the nominating committee, otherwise 0;
BLOCK	= indicator variable set to 1 if an independent large blockholder (five percent or more) serves on the audit committee, otherwise 0;
CEOSHR	= percentage of a firm's common stock owned by the CEO, including those stock options 'in the money' exercisable within 60 days;
PERS	= earnings persistence at the beginning of the year measured over an eight year period;
VOLA	= standard deviation of daily stock returns for fiscal year t-1;
ACCU _{t-1}	= the negative of the absolute value of the difference between actual earnings per share and most recent median forecast of earnings per share for fiscal year t-1;
NEWFORE	= number of forecasts revised during the month divided by the number of forecasts, averaged over the twelve months of the fiscal year;
FOLLOW	= number of analysts providing an annual earnings forecast as of the beginning of the year;
LOSS	= indicator variable set to 1 if the firm reports a loss for the year, otherwise 0; and
SIZE	= market value of equity in billions at the beginning of the year.

TABLE 4
Results from Regressing Forecast Dispersion on Audit Committee Attributes
and Other Controls

	sign	Base Model	Independence Model	Expert Model	Joint Model
ADJ. R-SQR		0.5777	0.5810	0.5774	0.5807
Intercept	?	0.618 (20.03) ***	0.627 (20.33) ***	0.615 (19.28) ***	0.626 (19.61) ***
IND_t	-		-0.042 (3.33) ###		-0.042 (3.30) ###
EXPERT_t	-			0.006 (0.40)	0.001 (0.96)
BODIND_t	?	0.004 (0.22)	0.031 (1.52)	0.002 (0.12)	0.031 (1.45)
NOINF_t	?	-0.008 (0.57)	-0.003 (0.24)	-0.008 (0.59)	-0.003 (0.24)
BLOCK_t	?	-0.049 (1.63)	-0.056 (1.87) *	-0.048 (1.60)	-0.056 (1.86) *
CEOSHR_t	?	-0.069 (3.29) ***	-0.065 (3.12) ***	-0.069 (3.30) ***	-0.065 (3.12) ***
PERS_t	-	-0.105 (5.57) ###	-0.103 (5.45) ###	-0.105 (5.58) ###	-0.103 (5.45) ###
VOLA_{t-1}	+	0.117 (5.76) ###	0.119 (5.86) ###	0.118 (5.77) ###	0.119 (5.85) ###
ACCU_{t-1}	-	-0.240 (11.83) ###	-0.238 (11.77) ###	-0.240 (11.83) ###	-0.238 (11.77) ###
NEWFORE_t	+	0.379 (19.35) ###	0.376 (19.24) ###	0.380 (19.34) ###	0.376 (19.23) ###
FOLLOW_t	-	0.062 (2.30) ##	0.060 (2.23) ##	0.062 (2.31) ##	0.060 (2.23) ##
LOSS_t	+	0.133 (4.37) ###	0.135 (4.44) ###	0.133 (4.35) ###	0.135 (4.43) ###
SIZE_t	-	-0.379 (12.71) ###	-0.384 (12.91) ###	-0.380 (12.71) ###	-0.384 (12.88) ###

TABLE 4: CONTINUED

Notes:

*, ** and *** signify two-tailed significance at the 0.10, 0.05 and 0.01 level. #, ## and ### signify one-tailed significance at the 0.10, 0.05 and 0.01 level.

All variables are defined in Table 3.

TABLE 5
Results from Regressing Forecast Accuracy on Audit Committee Attributes
and Other Controls

	sign	Base Model	Independence Model	Expert Model	Joint Model
ADJ. R-SQR		0.5496	0.5505	0.5502	0.5513
Intercept	?	0.62508 (19.62) ***	0.620 (19.40) ***	0.612 (18.59) ***	0.604 (18.27) ***
IND_t	+		0.024 (1.88) ##		0.027 (2.07) ##
EXPERT_t	+			0.024 (1.63) #	0.027 (1.84) #
BODIND_t	?	-0.013 (0.64)	-0.028 (1.33)	-0.021 (1.02)	-0.039 (1.77)
NOINF_t	?	0.000 (0.02)	-0.002 (0.17)	-0.001 (0.06)	-0.004 (0.28)
BLOCK_t	?	0.039 (1.26)	0.043 (1.39)	0.043 (1.38)	0.048 (1.54)
CEOSHR_t	?	0.014 (0.63)	0.011 (0.52)	0.013 (0.60)	0.011 (0.49)
PERS_t	+	0.073 (3.75) ###	0.072 (3.67) ###	0.073 (3.72) ###	0.071 (3.63) ###
VOLA_{t-1}	-	-0.120 (5.70) ###	-0.121 (5.75) ###	-0.118 (5.59) ###	-0.118 (5.63) ###
ACCU_{t-1}	+	0.139 (6.65) ###	0.138 (6.60) ###	0.139 (6.67) ###	0.138 (6.61) ###
NEWFORE_t	-	-0.552 (27.27) ###	-0.550 (27.17) ###	-0.552 (27.29) ###	-0.550 (27.19) ###
FOLLOW_t	+	0.061 (2.20) ##	0.062 (2.25) ##	0.062 (2.22) ##	0.063 (2.28) ##
LOSS_t	-	-0.105 (3.34) ###	-0.106 (3.38) ###	-0.106 (3.38) ###	-0.108 (3.43) ###
SIZE_t	+	0.152 (4.93) ###	0.155 (5.02) ###	0.149 (4.82) ###	0.152 (4.92) ###

TABLE 5: CONTINUED

Notes:

*, ** and *** signify two-tailed significance at the 0.10, 0.05 and 0.01 level. #, ## and ### signify one-tailed significance at the 0.10, 0.05 and 0.01 level.

All variables are defined in Table 3.

TABLE 6
Results from Regressing Revision Volatility on Audit Committee Attributes
and Other Controls

	sign	Base Model	Independence Model	Expert Model	Joint Model
ADJ. R-SQR		0.5930	0.5970	0.5930	0.5974
Intercept	?	0.41361 (13.66) ***	0.423 (13.99) ***	0.422 (13.48) ***	0.435 (13.89) ***
IND_t	–		-0.045 (3.71) ###		-0.047 (3.84) ###
EXPERT_t	–			-0.014 (1.02)	-0.020 (0.15)
BODIND_t	?	0.009 (0.46)	0.038 (1.89) *	0.013 (0.69)	0.046 (2.20) **
NOINF_t	?	0.000 (0.02)	0.005 (0.35)	0.000 (0.03)	0.006 (0.43)
BLOCK_t	?	-0.060 (2.03) **	-0.068 (2.30) **	-0.062 (2.10) **	-0.071 (2.41) **
CEOSHR_t	?	-0.017 (0.84)	-0.013 (0.64)	-0.017 (0.83)	-0.013 (0.61)
PERS_t	–	-0.062 (3.34) ###	-0.059 (3.20) ###	-0.062 (3.32) ###	-0.059 (3.17) ###
VOLA_{t-1}	+	0.136 (6.81) ###	0.138 (6.93) ###	0.135 (6.73) ###	0.136 (6.83) ###
ACCU_{t-1}	–	-0.158 (7.94) ###	-0.156 (7.86) ###	-0.158 (7.95) ###	-0.156 (7.87) ###
NEWFORE_t	+	0.539 (27.98) ###	0.535 (27.91) ###	0.539 (27.98) ###	0.535 (27.91) ###
FOLLOW_t	–	-0.108 (4.07) ###	-0.110 (4.18) ###	-0.108 (4.08) ###	-0.111 (4.21) ###
LOSS_t	+	0.108 (3.60) ###	0.109 (3.68) ###	0.108 (3.62) ###	0.111 (3.72) ###
SIZE_t	–	-0.169 (5.76) ###	-0.174 (5.96) ###	-0.167 (5.69) ###	-0.172 (5.88) ###

TABLE 6: CONTINUED

Notes:

*, ** and *** signify two-tailed significance at the 0.10, 0.05 and 0.01 level. #, ## and ### signify one-tailed significance at the 0.10, 0.05 and 0.01 level.

All variables are defined in Table 3.