Audited Financial Reporting and Voluntary Disclosure as Complements: A Test of the Confirmation Hypothesis

Ray Ball
The University of Chicago Booth School of Business
5807 S. Woodlawn Avenue
Chicago, IL 60637
Tel. (773) 834 5941
ray.ball@chicagobooth.edu

Sudarshan Jayaraman
Olin Business School
Washington University in St. Louis
Campus Box 1133
One Brookings Drive
St. Louis, MO 63130
jayaraman@wustl.edu

Lakshmanan Shivakumar
London Business School
Regent's Park
London, NW1 4SA
United Kingdom
LShivakumar@london.edu

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Abstract

We examine the "confirmation" hypothesis that audited financial reporting and disclosure of managers' private information are complements, because independent verification of outcomes disciplines and hence enhances disclosure credibility. Committing to higher audit fees (a measure of financial statement verification) is associated with management forecasts that are more frequent, specific, timely, accurate and informative to investors. Because private information disclosure and audited financial reporting are complements, their economic roles cannot be evaluated separately. Our evidence cautions against drawing inferences exclusively from market reactions around "announcement periods" because audited financial reporting indirectly affects information released at other times and through other channels.

1. Introduction

We test the hypothesis that audited financial reporting and voluntary disclosure of managers' private information are complementary mechanisms for communicating with investors, not substitutes. The basic idea is that commitment to independent verification of financial outcomes allows managers to credibly disclose private information that is costly for investors or auditors to verify directly. This alleviates the problem that private information disclosure is uninformative as a stand-alone mechanism because in equilibrium it is untruthful (Crawford and Sobel, 1982). Managers are encouraged to be more truthful when they are aware their disclosures of private information subsequently will be confirmed more accurately and freer of their own manipulation. Commitment to the independent verification of financial reporting therefore enhances the credibility of managers' disclosures of private information, and hence financial reporting and disclosure are complements.

Consistent with the hypothesis that audited financial reporting and voluntary disclosure of managers' private information are complements, we show that the resources firms commit to financial statement verification by independent auditors are an increasing function of the resources devoted to management forecasting, our proxies for which are forecast frequency, specificity, and timeliness (i.e., horizon). Further, the accuracy of management forecasts and the market reaction to them increase in the resources committed to independent audit.

The mechanisms by which managers can commit to truthful disclosure of private information are not well understood. An obvious and important mechanism is commitment to a reporting regime: notably, to listing as a public versus private firm (Ball and Shivakumar, 2005, 2008a; Burgstahler et al., 2006; Leuz et al., 2008), or to listing in a particular jurisdiction (Coffee, 1999; Ball et al., 2000; Rock, 2002). Commitment to a regime incurs the costs of

meeting its minimum reporting and disclosure standards, or the costs of failing to meet those standards (litigation costs, fines, jail, etc). However, little is known about how firms within a particular regime can credibly commit to different levels of disclosure of private information.

We propose that one mechanism by which firms make different within-regime commitments to truthful disclosure of private information is by committing to different levels of audit of actual financial outcomes. Credible disclosure must incur some cost (Spence, 1973). The cost of committing to a particular level of independent audit includes audit firm fees (a function of both the quantity and quality of audit resources supplied), associated internal accounting and control costs, internal audit costs, management time, and reduced utility from managers restricting their ability to manipulate the financials. The chosen level of independent audit affects the measurement accuracy and independence from managerial manipulation of the reported financial outcomes. In turn, the expectation of more accurate and independent *ex post* accounting disciplines managers to be more truthful *ex ante* in their private information disclosure.[1]

Complementarity implies the resources allocated to voluntary disclosure and auditing financial reporting are positively correlated. We therefore hypothesize that: (1) firms committing more resources to disclosing private information also commit to higher levels of audit verification; and (2) commitment to higher levels of audit verification is associated with increased forecast accuracy and larger investor responses to disclosures. These hypotheses treat audit as a differentiated product that allows firms some choice over the level of audit effort, not as a standardized commodity determined exclusively by regulation. This treatment is consistent

[1] We assume that increased audit verification leads to more accurate observation of actual cash flows and of important predictors of future cash flows that underlie accounting accruals, such as accounts receivable collectability and inventory deterioration, and hence to reporting more precise financial information, including earnings. We test the hypothesis that this allows managers to commit to more truthful disclosure of private information. We do not test the related hypothesis that increased verification might also allow or incent managers to incorporate more new information in actual (versus forecast) earnings, notably via loss recognition (see Roychowdhury and Sletten, 2010).

with the auditing literature, discussed below, and with the substantial variation observed in audit fees even after controlling for variables such as firm size and complexity.

We test these hypotheses by focusing on a specific type of voluntary disclosure, namely, management earnings forecasts. Caution should be exercised in generalizing our results to other voluntary disclosures, particularly non-financial disclosures. Forecasts of earnings and other financial statement variables such as revenues and expenses are more directly confirmed by audited outcomes than is the case for more qualitative disclosures such as product market strategies. Consequently, the confirmatory role of audited financial statements most likely is weaker when the disclosure cannot be so directly linked to specific financial statement outcomes.

We report a variety of evidence that audited financial reporting and voluntary disclosure of managers' private information are complements. First, there is wide variation across firms in the resources committed to both management forecasting activity (forecast frequency, specificity and horizon) and financial statement verification via audit fees (before and after controls for size, complexity, etc.). Second, the amounts of forecasting and audit activity are positively correlated: one standard deviation increases in forecast frequency, specificity and horizon are associated with 4.6 percent, 8.4 percent, 4.9 percent increases in excess audit fees (after controls), respectively. Third, forecasting accuracy and audit activity levels also are positively correlated: a one standard deviation increase in forecast accuracy is associated with a 2.5 percent increase in excess audit fees. Fourth, the market reaction to the disclosure of management forecasts increases by approximately 10% with a one standard deviation increase in resources committed to financial statement verification (excess audit fees), consistent with investors perceiving the credibility of voluntary disclosures to be a function of the resources spent on independent verification of subsequent outcomes. Overall, voluntary disclosure of private information and

audited financial statement outcomes appear to play complementary roles in communicating information.

Under our complementarity hypothesis, we expect resource allocation decisions for voluntary disclosure (in particular, earnings forecasting) and independent audit to be made jointly. Consequently, forecasting activity is endogenous to the audit decision, and Ordinary Least Squares (OLS) estimates of the relation between them could be biased (Arora, 1996). Our primary results therefore are based on a Three Stage Least Squares (3SLS) specification that models the simultaneous relation between financial statement verification and forecasting activity. The conclusions are not altered by using OLS and Two Stage Least Squares (2SLS) specifications. [2] Nor are they altered in firm-fixed effects regressions, indicating that the relation is not entirely due to time-invariant firm characteristics. The inferences also are robust with respect to one-way clustering of the standard errors (by firm) or two-way clustering (by firm and by year). In addition, we verify that the results are robust to including only one observation per firm. We estimate a robust regression and find the results are not affected by outliers. We obtain similar results using a simpler model to estimate excess audit fees, controlling only for firm size. The results for forecast specificity and forecast horizon, which are based only on firms making management forecasts, are robust to controlling for selection biases using a Heckman model. The conclusions are not affected when individual forecast attributes are orthogonalized to the information in other forecast attributes. Finally, the results are robust to alternative proxies for the level of commitment to audit verification and for management forecast properties.

Litigation risk is a potentially correlated omitted variable, since firms with greater litigation risk both make more disclosures (Skinner, 1994; Field et al., 2005) and pay higher

[2] Further, many of the variables that are likely to be correlated with both forecasting attributes and audit fees (notably, firm complexity and volatility of cash flows) predict a negative relation between audit fees and forecast specificity, whereas we predict and observe a positive relation.

audit fees (Simunic, 1980; Dye, 1993; Lys and Watts, 1994; Shu 2000). However, we find the relation between audit fees and management forecasts typically is *weaker* for high-risk firms, which is inconsistent with litigation risk explaining the relation between audit fees and forecasting activity.

Our paper offers several contributions to the literature. We empirically document the complementarity between audited financial reporting and voluntary disclosure. Complementarity implies financial reporting usefulness depends on its contribution to the total information environment, whereas substitutability implies usefulness depends on the new information reports release on a stand-alone basis (as measured for example by the surprise value of earnings announcements).[3] Second, we demonstrate one mechanism (commitment to independent audit of financial outcomes) by which managers can credibly commit to truthfully disclose private information. Third, our study contributes to the management forecast literature by documenting how financial statement verification affects forecast credibility and other forecast characteristics. Prior research reports that forecasts are associated with favorable market reactions (e.g., Foster (1973), Patell (1976), Penman (1980), Waymire (1984, 1985), Healy et al. (1999)), reduced information asymmetry (e.g., Frankel et al. (1995), Coller and Yohn (1997)) and lower litigation risk (e.g., Skinner (1994), Field et al. (2005)). [4] Our evidence suggests an explanation for these positive outcomes: firms can credibly commit to more informative and truthful management forecasts by requiring enhanced auditor authentication of financial statement outcomes. Fourth, our evidence that the amount of resources committed to audit fees is robustly related to voluntary forecasting activity is consistent with the existence of a private (i.e., market) demand for

[3] Contrast Lev (1989) with Ball and Shivakumar (2008b), and Barth et al. (2001) with Holthausen and Watts (2001).
[4] Hirst, Koonce and Venkataraman (2008) review the management forecast literature.

auditing, as argued by Watts and Zimmerman (1983, 1986), and with auditing being more than a commodity mandated by regulation.

The study also contributes to our understanding of the economic role of financial reporting, and hence to standard-setting (for example, to the role of fair value accounting). If one accepts the factual premise that independently verifiable information consists primarily of backward-looking actual outcomes and that managers' private information consists primarily of forward-looking expectations that are costly (perhaps infinitely) to independently verify, then the efficient equilibrium involves the following separation: financial statement information is constrained to a subset that is independently verifiable, which is information that is primarily backward-looking and less timely when considered in isolation; but in consequence managers increase the quantity of credible forward-looking, timely private information that they disclose. Because audited financial reporting and private information disclosure complement each other in this fashion, their economic roles cannot be evaluated separately by researchers, regulators or standard-setters. For example, price reactions and bid-ask spread reactions during "announcement periods" are not sufficient measures of financial reporting effects on capital markets because audited financial reporting indirectly affects information released at other times and through other media.

The rest of the paper is arranged as follows: Section 2 presents the hypotheses. Section 3 presents the research design and Section 4 presents results on the relation between audit fees and properties of management forecasts. Section 5 presents results that examine the role of litigation risk and Section 6 describes the robustness checks. Section 7 concludes.

2. Hypotheses

2.1. Confirmation Hypothesis: Financial Reporting and Disclosure are Complements

In this section, we outline the hypothesis that audited financial reporting and voluntary disclosure of managers' private information are complementary mechanisms for communicating with investors, not substitutes. We build on the Ball (2001) argument that the primary (but not exclusive) role of financial reporting is to supply auditable financial outcome variables for use in efficient contracting with the firm, including providing of a mechanism through which managers can credibly commit to disclose truthful private information to users. [5]

Voluntary disclosure of information that is privately known only to managers has a primarily informational rather than contracting role. However, this potential cannot be unlocked if managers cannot credibly commit to be truthful. As Crawford and Sobel (1982) demonstrate, in equilibrium unverifiable disclosures by themselves are untruthful and hence uninformative. Managers seeking to provide informative disclosure of private information therefore need a mechanism for credibly committing to be truthful. We propose that committing to the provision of high-quality audited financial statements is one such mechanism.[6]

We propose the mechanism works as follows. Reporting *ex post* financial outcomes (such as revenues, earnings and total assets) that are both accurate and independent of management manipulation permits outsiders (such as boards, analysts, lenders and investors) with a means of evaluating the truthfulness of past management disclosures. In turn, the expectation that actual outcomes will be accurately and independently reported serves to discipline managers to make more truthful and hence more informative voluntary disclosure *ex ante*. Financial reporting based on independently verifiable information therefore allows managers to implicitly contract (commit) to truthfully disclose unverifiable information. This complementarity in roles implies

[5] Watts and Zimmerman (1986) distinguish the contracting and informational roles of financial reporting, and emphasize the former. In this paper, we emphasize the interaction between them as complementary mechanisms.

[6] Our hypotheses do not rule out other mechanisms, such as monitoring by boards and analysts, and securities litigation. We control for other such mechanisms in our empirical analysis by using firm fixed effects.

that financial reporting is an input to the firm's total information environment, and that it only can be designed and evaluated by its contribution to the efficiency of the complete system of communicating with investors and other users. This complementary relation between audited financial statements and voluntary disclosure is termed the "confirmatory role" of financial reporting.

An important implication of financial statements providing confirmation of voluntary disclosures is that the two sources provide information with different characteristics, most notably timeliness. It is reasonable to assume that, as a factual matter, independently verifiable information consists primarily of backward-looking actual outcomes, and managers' private information consists primarily of forward-looking expectations that are not independently verifiable (or are considerably more costly to verify, perhaps infinitely so). Under this assumption, we propose the efficient equilibrium involves a separation of information types. Financial statement information then is constrained to a subset that is independently verifiable, which consequently consists of information that is primarily backward-looking and that is less timely when considered in isolation. Managers then are able to increase the quantity of credible forward-looking, timelier private information that they provide through voluntary disclosure.

Under this view of the economic role of financial reporting, financial statements contain information that is predominantly "historical" or backward-looking, but verifiable at relatively low cost by independent auditors. Conversely, audited financial reporting is a relatively inefficient mechanism for communicating forward-looking information to outsiders, because it is relatively costly to verify independently.

Because audited financial reporting and private information disclosure complement each other in this fashion, their economic roles cannot be evaluated separately by researchers,

regulators or standard-setters. For example, one implication of complementarity is that the timeliness with which investors and other parties become informed does not bear a one-for-one correspondence with the timeliness of financial statement information.

These hypotheses are broadly consistent with evidence that earnings announcements have relatively low informativeness. Ball and Brown (1968) conclude that 80% of the news in annual earnings is anticipated from other sources before the announcement month. While subsequent studies show that earnings announcements have some surprise content, the evidence is that they exhibit low overall timeliness (e.g. Lev 1989 and Ball and Shivakumar 2008b).

The confirming role of audit verification of financial reports could be relevant to disclosures of both bad and good news. Some early studies on management forecasts suggest that bad news is inherently more credible than good news because managers gain more from disclosing good news (e.g., Skinner (1994) and Hutton, Miller and Skinner (2003)). Skinner (1994) also argues that managers have an incentive to release bad news early to reduce the litigation risk associated with delayed negative surprises. The argument that bad news disclosures are inherently more credible implies that audit verification is less relevant for bad news than for good news. However, more recent studies suggest that, even if managers have lower incentives to disclose bad news, they nevertheless have incentives to exaggerate losses and thus create reserves for the future (i.e., to take "big baths"). Consistent with this view, Rogers and Stocken (2005) report that bad forecast news is not less – and possibly is more – biased than good forecast news. Hurwitz (2010) argues that litigation risk reduces optimism in good but not bad news disclosures, and reports that bad news is more optimistically biased than good news, particularly in the post-Reg FD period of our sample. Kothari et al. (2009) find little support for

the view that good news forecasts are less credible than bad news forecasts.[7] These findings suggest that bad news forecasts are not inherently more credible than good news, and that audit verification would add credibility to both.

We propose that a firm's chosen level of independent audit affects both the accuracy and the potential for manipulation of reported financial outcomes, and thereby affects the ability of reported outcomes to act as a complementary confirming mechanism that disciplines the disclosure of private information. We conjecture that the benefits from increased verification depend on the amount of private information managers want to disclose. The desired quantities of audited financial reporting and voluntary disclosure thus are jointly determined. Firms allocating more resources to voluntary disclosure (notably, by incurring the costs of making earnings forecasts that are more frequent, timely, specific or accurate) are likely to allocate more resources to audited financial reporting. Hence, we predict that firms making voluntary disclosures that are more frequent, more timely, more specific or more accurate commit to higher audit verification.[8] Firms that make few, untimely, vague or inaccurate disclosures are less likely to demand higher audit verification. The above discussion leads us to the *Confirmation Hypothesis*:

H1: Firms committing more resources to voluntary disclosure – by making disclosures that are more frequent, more timely, more specific or more accurate – commit more resources to audit verification.

2.2. Implications of the Confirmation Hypothesis for the market reaction to voluntary disclosure

[7] Kothari et al. (2009) document a larger short-window price reaction for bad than for good news management forecasts, controlling for the magnitude of the news, but observe no asymmetry in the long-window reaction. They conclude that their overall evidence is inconsistent with good news forecasts being less credible than bad.

[8] An earnings-management focused theory would predict almost the opposite: that managers issue more forecasts when there is lower commitment to audit verification and thus greater freedom to manage earnings to meet their forecasts. Managers' incentives to behave in this fashion would be reduced to the extent that investors rationally discount voluntary disclosures when there is low commitment to audit verification, and hence low credibility.

Voluntary disclosure is expected to be particularly relevant to stock market investors, as residual claimants. Hence, if additional verification of financial statements is intended to improve the reliability of voluntary disclosures, one should observe a greater stock market reaction to voluntary disclosures that are associated with greater financial statement verification levels. This leads us to the following implication of the Confirmation Hypothesis:

H2: The stock market reaction to firms' voluntary disclosures increases in their level of commitment to financial statement verification.

2.3. Related literature

The Confirmation Hypothesis is closely related to models developed by Gigler and Hemmer (1998), Stocken (2000) and Lundholm (2003).[9] These studies investigate how verifiable accounting reports increase the credibility of non-verifiable voluntary disclosure, though the setting in each is different. In contrast to our study, these papers do not evaluate the role of audit verification to signal the credibility of voluntary disclosures to capital market participants.

Gigler and Hemmer (1998) show how mandatory reporting complements voluntary disclosures of private information, by playing a confirmatory role in an agency setting where voluntary disclosures are motivated by the desire to achieve efficient contracting. The firm releases earnings reports at varying mandated intervals, but voluntary disclosures are more informative about "true" earnings in their setting because they are based on managers' private information. While they do not investigate voluntary choice of verification accuracy, their analysis is relevant to our Confirmation Hypothesis in several ways. First, they find that subsequently revealed earnings reports perform a "confirmatory" role because managers' voluntary disclosures are more informative but not credible, while the reverse is true for earnings

[9] Lev and Penman (1990) point out that management forecasts are credible because these can ex-post be verified by comparison with audited reports. However, they do not focus on this issue.

reports. Second, they find that the overall informational efficiency of prices falls as the frequency of mandatory reports rises. This insight is similar to our argument that the overall usefulness of earnings information should not be gauged solely by its stand-alone "information content."

Stocken (2000) investigates disclosures in the context of financing an investment project. He argues that, in the absence of a mechanism to enforce verifiability, voluntary disclosures are not credible and therefore are ignored by the market (similar to Crawford and Sobel (1982) and Lundholm (2003)). However, accounting reports that verify information in managers' voluntary disclosures make these disclosures credible and thus informative in equilibrium, and achieve a better allocation of capital. A similar conclusion is reached in Lundholm (2003), who examines a setting where a firm faces adverse selection in the equity market and relies on voluntary disclosures to alleviate the problem. In these models, even though the mandatory report is backward-looking and therefore has no informational content, it nevertheless serves a role in improving the information environment by making voluntary disclosures credible.

Our hypothesis that mandatory earnings and managers' private information act as complements in improving the overall information environment is closely related also to the information economics literature. While early studies in this literature (e.g., Verrecchia (1982) and Diamond (1985)) model public and private information as substitutes, several subsequent studies examine settings where public and private information can be complements. We argue that the extent to which managers' private information gets impounded into prices depends on the ability of subsequent public information (viz., earnings) to credibly verify the private information. In this sense, we consider private and public information to be complements.

Among studies of the relation between private and public information, McNichols and Trueman (1994) comes closest to ours.[10] They examine a setting where informed traders know that an upcoming public disclosure will be informative, and acquire and trade on private information before the announcement. Thus, stock prices anticipate much of the information in earnings. Private information then is impounded in prices through informed trading, whereas in our setting it does so through credible management disclosure. In both settings, the extent to which private information is impounded into prices depends on characteristics of the earnings report.

Beniluz (2004) provides a test of the Confirmation Hypothesis that in many ways is similar to ours, but does not address the complementary role of auditing. His test also is dependent on questionable measures of accrual quality. Ball and Shivakumar (2008b) and Ball, Robin and Sadka (2008) provide indirect tests that also do not address the complementary role of auditing.

3. Definition and Measurement of Variables

Testing the Confirmation Hypothesis requires measures of the resources committed to voluntary disclosure and independent audit. These are described in the following two sub-sections. Sub-section 3.3 discusses measures of the stock market reaction to voluntary disclosures.

[10] These include Bushman (1991) who allows for sale of private information by informed traders, Lundholm (1988) and Manzano (1999) who allow public and private signals to be correlated and Indjejikian (1991) who allows multiple private signals received by informed traders to be correlated. Alles and Lundholm (1993) present a general representation of the asset payoff and information structures and derive predictions based on modifications to the structure. Substitutability versus complementarity of public and private information depends on whether the private signal is about the asset payoff or the public signal (e.g., Kim and Verrecchia (1994), Demski and Feltham (1994), Bagnoli and Watts (2007)). Except in Demski and Feltham (1994), these models have simultaneous public and private signals and do not address subsequent verification. Demski and Feltham (1994) examine a rational expectations model with private information acquisition in anticipation of earnings announcements, but assume that private signals are primarily informative about the public signal and are only indirectly related to the terminal dividend. We do not discuss studies that assume private information cannot be credibly communicated (e.g., Kanodia and Lee (1998)).

3.1. Proxies for resources committed to voluntary disclosure

We select management earnings forecasts as the voluntary disclosure variable, for several reasons. Management earnings forecasts are an important source of information to investors.[11] They are comparatively homogenous, relative to other disclosures such as conference calls, press releases, SEC filings and MD&A reports. Measures of the amount of resources used in forecasting are available, including forecast specificity (e.g., point versus range) and forecast horizon (unlike many other forward-looking disclosures, the timing of the actual earnings outcome is known). Finally, the informativeness of forecasts can be measured, by comparing the forecasts with either actual earnings outcomes or consensus analyst forecasts, and by estimating the market reaction to the forecast announcements.

The amount of resources allocated to voluntary forecasting is not directly measurable. As proxies, we study the number (*FREQUENCY)*, timeliness (*HORIZON*), specificity (*SPECIFICITY*) and accuracy *(ACCURACY)* of firms' forecasts. We expect that forecasting that *ceteris paribus* is more frequent, more timely, more specific or more accurate requires greater resources to produce and disclose. We employ multiple proxies in the expectation that each captures a different forecast property that affects forecast costs. We regress them on excess audit fees both individually and after controlling for the other proxies. The proxies have been studied extensively in prior literature (e.g., Baginski et al. (1993), Skinner (1994), Baginski and Hassell (1997), Rogers (2008)). Each proxy is constructed such that larger values indicate either more frequent or potentially more informative forecasts, and thus indicate greater resource utilization. Proxies other than *FREQUENCY* are averaged across all forecasts made by a firm in a given year to obtain annual measures. We exclude forecasts made after the fiscal period end because these

[11] Foster (1973), Patell (1976), Waymire (1984, 1985), Hoskin et al. (1986), Anilowski et al. (2007), Ball and Shivakumar (2008b), Hirst et al. (2008) and Rogers et al. (2008).

are considered early earnings warnings of the actual earnings outcome, rather than forecasts (e.g., Hirst et al. (2008), Rogers (2008)).

FREQUENCY is a count of the number of annual and quarterly EPS forecasts made during a year by a firm. [12] Firms not making any forecasts in a year are assigned a value of 0 for that firm/year. *SPECIFICITY* is a measure of forecast specificity or precision. Following prior studies (e.g., Baginski et al. (1993), Baginski and Hassell (1997), Rogers (2008)), point estimates are considered the most specific, followed by range estimates (where the minimum and maximum values are provided), then by open-ended estimates (where one end of the range is provided but not the other), and finally by qualitative estimates. *SPECIFICITY* takes the value of 4, 3, 2 and 1 for point, range, open-ended and qualitative estimates respectively, and firm/years with no forecasts are not included in its analysis.[13] Consistent with prior studies, we interpret more specific forecasts as being more informative. *HORIZON* is computed as one plus the log of the difference in days between the fiscal period end and the forecast date, where larger values of *HORIZON* indicate more timely, and hence more informative, forecasts. *HORIZON* is computed only for firm/years with an earnings forecast and with non-missing forecast dates.

We also investigate forecast accuracy as an ex-post measure of the resources allocated to forecasting activity. Unlike *FREQUENCY, SPECIFICITY AND HORIZON*, forecast accuracy is not entirely within a manager's choice set when issuing a forecast, because it is determined only when actual earnings are subsequently reported. Nevertheless, this variable is expected to be positively correlated with the resources managers commit to improving the quality of the private information in their forecasts. We define forecast accuracy (*ACCURACY*) as minus one times the absolute value of the difference between the management forecast (defined only for point and

[12] In case of multiple forecasts issued by a firm on the same day, we retain the annual forecast with the shortest horizon or the quarterly forecast with the shortest horizon, if no annual forecast is available.
[13] Assigning a *SPECIFICITY* value of 0 for firm-years without forecasts does not qualitatively affect the results.

range forecasts) and actual earnings scaled by the absolute value of actual earnings. Larger values indicate more accurate disclosures and, hence, greater resource allocations.

3.2. Proxies for financial statement verification

We follow a substantial auditing literature starting with Simunic (1980) and Watts and Zimmerman (1983), and use the amount of excess audit fees paid by a firm as the proxy for the extent of its financial statement verification, based on the logic that incremental audit effort is priced by its auditors. This implicitly assumes that audit is not a standardized commodity determined exclusively by regulation, but is a differentiated product that allows clients to choose their auditor and various other dimensions of audit quality and effort. The auditing literature has long held the view that audit is a differentiated product, for example with larger auditors and specialist auditors providing greater audit quality (O'Keefe et al., 1994).[14] Audit fees are affected by the choice of audit firm (notably, Big Four versus smaller firm), the seniority level of the audit engagement partner, the number of audit personnel on the job and their average hourly rate, the degree of verification of internal control systems and individual transactions required by the client, the frequency of communication with the audit committee, and other variables. Fees typically are negotiated by management and approved by audit committees in advance. They are directly linked to the quantity and price of audit activity, and hence to the extent of independent verification of financial reporting.

Excess audit fees represent fees that are incremental to those associated with previously identified determinants. We study the log transformation of total audit fees (*LN_FEES*),

[14] See Caramanis and Lennox (2008) and Higgs and Skantz (2006). Titman and Trueman (1986) and Datar et al. (1991) develop models in which managers choose higher audit quality to signal favorable private information. Kanodia and Lee (1998) study the role of periodic performance reports in alleviating managers' incentives to undertake suboptimal investments. Larcker and Richardson (2004) show that auditors, primarily due to reputation concerns, limit unusual accounting choices of client firms. Larger and more reputed auditors charge higher fees (e.g., DeFond (1992) and Fan and Wong (2005)). Watts and Zimmerman (1983) trace the evolution of voluntary audits to the early stages in the development of corporations.

consistent with prior studies, and include previously identified determinants in the regression specification to capture the expected level of fees in the absence of management forecasts.

3.3. Measurement of stock reactions to management forecast releases

We measure the stock return volatility and volume reactions to management forecasts using the approach of Landsman and Maydew (2002). The cumulative abnormal return (*CAR*) at management forecasts is measured as the 3-day cumulative return in excess of the value-weighted market return over days -1 to +1 relative to the management forecast date (day 0), standardized by the standard deviation of the excess returns in the non-announcement period (days -45 to -10).[15] Similarly, the abnormal volume (*ABVOL*) reaction to management forecast releases is measured as the average log turnover (share volume divided by shares outstanding) in days -1 to +1 minus the average log turnover in the non-announcement period, standardized by the standard deviation of log turnover in the non-announcement period.

4. Data and Results

4.1. Sample and descriptive statistics

Audit fee data are from Audit Analytics, management forecasts of earnings per share (EPS) are from First Call, stock market data are from CRSP and financial statement data are from Compustat. The sample covers the period 2000 to 2007 and consists of 44,883 firm-year observations for 9,172 unique firms with non-missing data for all variables.[16] Tests of the market reaction to management forecasts are based on a sample of 26,282 firm-year observations starting in 2001 because of the additional requirement of lagged values of audit fees. To ensure

[15] Qualitatively similar results are obtained when *CAR* is computed from a market model or is not standardized.
[16] There are 79,270 Compustat firm-year observations on for the period. We lose 17,329 observations merging the data with Audit Analytics. These are smaller firms with a median equity capitalization of $50 million, compared to a median of $176 million for firms with data on both files. We lose an additional 17,058 due to missing data.

that our results are not driven by a few influential observations, we Winsorize the continuous variables, each year, at the top and bottom percentiles. Our conclusions are insensitive to Winsorization, although some regression coefficients are sensitive to outliers.

Table 1 reports descriptive statistics. Panel A reports statistics for management forecast attributes, audit fees, stock market reaction to management forecasts and the control variables in the audit-fee regressions. *FREQUENCY* ranges from 0 to 7, with an average of 0.66. The average value of *SPECIFICITY* is 2.89, with a standard deviation of 0.64. *HORIZON* ranges from 0.69 to 6.12 (2 to 455 days before the fiscal period end), with a mean of 4.79 (120 days before the end). The mean and median annual audit fees are $1.16 million and $310,000, indicating skew in size. Similar skew is observed in book value of total assets, with mean $3.8 billion and median $244 million. The mean firm earns a negative return on assets during the sample period and 40% of the sample firm-years contain losses. The average liability, *LIAB*, computed as the ratio of total liabilities to book value of total assets, is 79%, while the median is 54%.[17]

Panel B of Table 1 presents descriptive statistics for the market reaction to management forecasts and the market-reaction-regression control variables. The data are for firm-years with a forecast. The average *CAR*, which is not conditional on the direction of the news, is close to zero and statistically insignificant.[18] The mean abnormal volume in the 3-day event surrounding management forecast date is 1.12 and is significant at less than the 1% level. On average, eight analysts follow each forecast-issuing firm and approximately 35% of these firms belong to high-litigation-risk industries, which is defined (following Rogers and Stocken (2005)) as bio-

[17] The skew is due in part to firms with negative book values of equity. The results are qualitatively unchanged by using logarithms of the ratio, by using market values of equity, and by deleting firms with negative book values.
[18] When the 3-day cumulative abnormal returns are not scaled by the standard deviation of abnormal returns in the non-announcement period, the average cumulative abnormal return is -0.10% (t=-2.80).

technology (SIC code 2833-2836 and 8731-8734), computing (SIC codes 3570-3577 and 7370-7374), electronics (SIC codes 3600-3674) and retailing (SIC codes 5200-5961).

4.2. Univariate evidence

Figure 1 plots the univariate relation between the disclosure proxies and audit fees. Panels A to D show the relation between values of *FREQUENCY*, *SPECIFICITY* and the deciles of *HORIZON* and *ACCURACY* with the average corresponding firm's *LN_FEES*. The panels, with the exception of Panel D, show a positive association between management forecast attributes and audit fees. Fees monotonically increase in *FREQUENCY*. Fees also monotonically increase in the first three quartiles of *SPECIFICITY* and eight deciles of *HORIZON*, but decrease over the remaining groups, indicating a potential non-linear relation.[19] While these positive relations between audit fees and management forecast properties are obvious in Figure 1, this evidence does not control for other determinants of audit fees. This reason also potentially explains the lack of a discernable relationship between *ACCURACY* and audit fees in Panel D.[20]

4.3. Univariate correlations

Table 2 reports the Spearman correlations among *LN_FEES*, the management forecast properties and the control variables.[21] In Panel A the management forecast properties generally are positively correlated, though most correlation coefficients are below 0.2. The one exception is the correlation coefficient of -0.55 between *ACCURACY* and *HORIZON*, which is not surprising as shorter-horizon forecasts are likely to be more accurate.

[19] In multivariate regressions below, we reject non-linearity based on adding a squared term for *HORIZON* or *SPECIFICITY*.

[20] As discussed in the next sub-section, *ACCURACY* and *HORIZON* are highly negatively correlated, which potentially affects the observed relation between *ACCURACY* and *LN_FEES*.

[21] Although Table 2 presents statistical significance for the correlation coefficients, we do not focus on these as the standard errors in this table do not consider potential lack of independence across observations.

LN_FEES is significantly positively correlated with *FREQUENCY*, *SPECIFICITY* and *HORIZON,* with correlation coefficients between 0.08 and 0.33, consistent with a first-order relation between voluntary disclosures and the extent of financial statement verification, and with the evidence in Figure 1. However, the correlation of *LN_FEES* with *ACCURACY* is negative, which potentially reflects the negative correlation between *ACCURACY* and *HORIZON* and the positive correlation between *HORIZON* and *LN_FEES*. This highlights the need to control for *HORIZON* when studying the relation between audit verification expenditure level and forecast accuracy. The correlations between the audit fee regression control variables and both forecast properties and fees generally are less than 0.3 and, with the exception of the correlation between *LN_ASSETS* and *LN_FEES* (which reflects scale effects) never exceed 0.5.

In Panel B of Table 2, the two measures of the market reaction to management forecasts, the absolute value of *CAR* (*ABS_CAR*) and abnormal volume (*ABVOL*), are positively correlated with audit fees in excess of firm-level determinants, *EX_FEES*. This provides preliminary evidence that market participants perceive additional audit effort as increasing the reliability of management forecasts.

4.4. Multivariate regressions

To empirically test Hypothesis H1 we wish to estimate the following regression equation:

$$LN\_FEES_{i,t} = \beta_0 + \beta_1 DISCLOSE_{i,t} + \beta_2 LN\_ASSETS_{i,t} + \beta_3 ROA_{i,t} + \beta_4 ACCR_{i,t} + \beta_5 CURRENT_{i,t} + \beta_6 FOREIGN_{i,t} + \beta_7 SEG_{i,t} + \beta_8 LIAB_{i,t} + \beta_9 LOSS_{i,t} + \beta_{10} DEC_{i,t} + \beta_{11} LAG_{i,t} + \varepsilon_{i,t} \quad (1)$$

where *DISCLOSE* refers alternately to *FREQUENCY, SPECIFICITY*, *HORIZON* or *ACCURACY.* Since Hypothesis H1 predicts a relation between *DISCLOSE* and excess audit fees, the regression controls for variables that prior research has shown to determine audit fees.

The log of total assets (*LN_ASSETS*) controls for firm size, which typically is viewed as the primary determinant of fees (Simunic (1980), O'Keefe, Simunic and Stein (1994), Bell, Landsman and Shackelford (2001)). The controls for audit complexity are total accruals scaled by total assets (*ACCR*), the ratio of current assets to total assets (*CURRENT*), the ratio of foreign segment sales to total sales (*FOREIGN*), and the number of business segments (*SEG*). The controls for audit risk are return on assets (*ROA*), the ratio of total liabilities to total assets (*LIAB*), an indicator variable for firm-years with negative earnings (*LOSS*), and the lag between the fiscal period end and the earnings announcement date (*LAG*). Firms with December fiscal year-ends are assigned a value of 1 for the indicator variable *DEC*, to control for any seasonal peak in audit costs.[22]

Our hypothesis that audit verification demand and voluntary disclosures are complementary raises the likelihood that firms simultaneously decide on how many resources to allocate for earnings forecasting and for independent audit. *DISCLOSE* then would be endogenous to the audit decision and OLS estimates of Equation (1) could be biased (Arora, 1996). Hence, we estimate Equation (1) as part of a simultaneous equation system along with the following regression for voluntary forecast disclosure (*DISCLOSE)*:

$$DISCLOSE_{i,t} = \gamma_0 + \gamma_1 LN\_FEES_{i,t} + \gamma_2 EARNVOL_{i,t} + \gamma_3 RETVOL_{i,t} + \gamma_4 ANALYST_{i,t} + \gamma_5 ISSUE_{i,t} + \sum Year + \sum Industry + \vartheta_{i,t} \quad (2)$$

where *DISCLOSE* refers alternately to forecast *FREQUENCY, SPECIFICITY, HORIZON* or *ACCURACY*. We control for variables prior studies show to be associated with forecasting activity. Following Imhoff (1978), Waymire (1985), Cox (1985) and Lang and Lundholm

[22] We do not control for the choice of Big 4 auditor because it is correlated with the choice of audit verification level. Nonetheless, our results for audit-fee regressions and market reaction analyses are qualitatively unaffected by controlling for it. Further, in the robustness section we present results using Big 4 auditor choice as a proxy for level of audit verification. Our results also are robust to including an indicator variable for qualified audit opinions.

(2000), we control for: earnings volatility (more volatile firms are less likely to issue forecasts which, if issued, are less informative, implying lower *SPECIFICITY* and *HORIZON*); stock return volatility; analyst following (firms with analyst following are more likely to make forecasts); and security issuance (firm issuing either debt or equity securities in the current or subsequent year are more likely to issue forecasts which, if issued, are more informative).[23] We include the log of audit fees (*LN_FEES*) to allow for exogenous shocks to audit verification standards causing firms to alter their voluntary disclosure policies. We also include year and 2-digit SIC industry fixed effects.

Since *ACCURACY* is determined by other forecast attributes, we additionally control for *FREQUENCY, SPECIFICITY* and *HORIZON* in the *ACCURACY* regression. This control allows us to investigate whether ex-post disclosure quality is associated with audit verification levels, independently of other forecast attributes.[24]

In this specification, we choose reporting lag (*LAG*) in the audit fees regression and security issuance (*ISSUE*) in the disclosure regression as instruments, following Whisenant et al. (2003). The inclusion and exclusion conditions require *LAG* to be associated with audit fees and to be orthogonal to the error term of the disclosure regression. Similarly, *ISSUE* needs to be associated with the disclosure proxies and orthogonal to the audit fees error. We have empirically verified the inclusion criterion as suggested in Larcker and Rusticus (2010). For the exclusion criterion, we rely on the Whisenant et al. (2003) argument that subsequent equity

[23] For each firm-year, we estimate earnings volatility and stock return volatility using the prior five years of data. We require a firm-year to have a minimum of 3 years of data to compute these variables.

[24] We do not control for *ACCURACY* in the *FREQUENCY, SPECIFICITY* or *HORIZON* regressions. First, as noted earlier, accuracy is an outcome variable that is unknown at the time of forecast issuance and hence is unlikely to determine *FREQUENCY, SPECIFICITY* and *HORIZON*. Second, *ACCURACY* is measurable only for firms with either point or range forecasts, so including it as a control variable severely restricts the sample size and the range of the dependent variables. For instance, when *ACCURACY* is included in *FREQUENCY* regressions, the sample loses firms that do not issue forecasts or issue qualitative forecasts. Similarly, in *SPECIFICITY* regressions, controlling for *ACCURACY* restricts the values of *SPECIFICITY* to either point or range forecasts.

issuances are unlikely to be directly associated with this year's audit fees, as distinct from any indirect effect through management forecasting. Similarly, we do not expect management forecasts made during the current year to be directly associated with the time elapsed between the fiscal year-end and earnings announcement dates. In unreported results, we also adopt the approach of Chan et al. (2010), using industry averages of the endogenous variables as instruments to better satisfy the exclusion criterion, and all disclosure variables and audit fees variables remain significant

FREQUENCY, SPECIFICITY and *HORIZON* most likely are simultaneously determined, so they are unlikely to be independent measures of the amount of resources allocated to forecasting. Table 2 reveals that this is not a major concern, as these forecast attributes are not highly correlated: the univariate correlations of 0.16, 0.06 and 0.11, while statistically significant assuming independence, imply that on a univariate basis each explains only 0.4% to 2.6% of the variation in the other. Nonetheless, to test whether our results are robust to controlling for other forecast attributes, we alternatively estimate the regressions after replacing *FREQUENCY, SPECIFICITY* and *HORIZON* in Equation (2) with *FREQ_RES, SPECIF_RES and HORIZ_RES* respectively, which are residuals from first-stage OLS regressions of each forecast attribute on the remaining two attributes. Similarly, we replace *ACCURACY* in Equation (2) with *ACCUR_RES,* the residual from a regression of *ACCURACY* on *FREQUENCY, SPECIFICITY* and *HORIZON*.[25]

Hypothesis H1, that firms disclosing more information commit to higher audit verification levels, predicts that the voluntary disclosure variables (*DISCLOSE*) are associated

[25] Alternatively, in the *FREQUENCY, SPECIFICITY* and *HORIZON* regressions (Equation (2)), we control for the other two attributes. This assumes that the remaining forecast attributes are exogenous to the simultaneous equation system in Equations (1) and (2). We then obtain equivalent inferences, indicating that potential biases from assuming the remaining forecast attributes to be exogenous are insufficient to overturn the results reported here.

with greater audit verification, as proxied by audit fees in excess of firm-level determinants. Our main prediction is that the coefficient β_1 in Equation (1) is significantly positive.

The hypothesis that audit verification and voluntary disclosures are complements might seem to predict that $\gamma_1$in Equation (2) also is positive. However, $\gamma_1$captures the relation between disclosures and total audit fees, not excess fees. We do not control for the normal determinants of audit fees in Equation (2) because the correlation between the main determinant, firm size (*LN_ASSETS*), and *LN_FEES* is 0.81.

We estimate Equations (1) and (2) simultaneously using 3SLS, which utilizes the correlation structure between $\varepsilon_{i,t}$ and $\vartheta_{i,t}$ to enhance estimation efficiency. 3SLS does not allow clustering of standard errors, so the *t*-statistics potentially are overstated. In Section 6 we reach almost identical conclusions from estimators that permit clustering of standard errors, such as Ordinary Least Squares, Two-Stage Least Squares, and firm-fixed-effect regressions, as well as from employing 3SLS on a sample restricted to one observation per firm.

Panels A and B of Table 3 present results from the 3SLS specifications. In each panel, the four sets of regressions present results for individual forecast attributes (namely, *FREQUENCY*, *SPECIFICITY, HORIZON* and *ACCURACY* respectively in Panel A) or the residuals of forecast attributes (namely, *FREQ_RES, SPECIF_RES, HORIZ_RES* or *ACCUR_RES* respectively in Panel B). In each set of regressions, the first two columns present results of the audit fee regression (1) and the last two columns present results of the management forecast attribute regression (2). The *FREQUENCY* regression has 44,883 observations, while the *SPECIFICITY* and *HORIZON* regressions have 8,869 observations because they are estimated only for firms making forecasts. The *ACCURACY* regressions, which are based only on point and range forecasts, have 7,342 observations.

In Panel A, in each of the four audit fee regressions (1), the coefficient on the management forecast attribute is positive and significant at less than the 1% level. The coefficients on *FREQUENCY*, *SPECIFICITY* and *HORIZON* are 0.378, 1.684 and 0.731 with *t*-statistics of 49.85, 20.33 and 22.55, respectively. Thus, even after controlling for known audit fee determinants and for the simultaneity between audit fees and management forecasting activity, audit fees are higher in firms with more frequent forecasts, with more specific forecasts and with longer-horizon forecasts. Similarly, the coefficient on *ACCURACY* is significantly positive at 0.052 (*t*-statistic = 10.54), suggesting that after controlling for relation of *ACCURACY* with *FREQUENCY*, *SPECIFICITY* and *HORIZON,* forecast accuracy is associated with excess audit fees.

These results also are economically significant. For instance, the coefficient of 0.378 on *FREQUENCY* implies that a one-standard deviation increase in the number of forecasts is associated with a 4.6% increase in audit fees relative to the mean. Similarly, one standard deviation increases in *SPECIFICITY*, *HORIZON* and *ACCURACY* are each associated with 8.4%, 4.9% and 2.5% increase in audit fees respectively.

In each of the management forecast attributes regressions (2), the coefficient of *LN_FEES* is positive and significant. While this is consistent with a higher level of audit verification being associated with a greater propensity to issue forecasts as well as forecasts that are more specific and for longer horizons, the result needs to be interpreted with caution because the regression does not control for other determinants of audit fees, such as firm-size. In both the audit fee and management forecast attribute regressions, the coefficients on the control variables and the explanatory power of the regressions generally are consistent with prior studies.[26]

[26] R-squares for 3SLS regressions are from the REG3 procedure in STATA and are not comparable to OLS. Because the residual sum of squares and total sum of squares in the 3SLS estimation are estimated over different regressors

Results based on residuals of forecast attributes in Panel B yield qualitatively similar conclusions. The coefficient on *FREQ_RES, SPECIF_RES, HORIZ_RES* and *ACCUR_RES* are significantly positive at less than the 1% level in the audit-fee regressions. The coefficients generally are comparable in magnitude to those reported in Panel A, consistent with the low correlations among the forecast attributes reported in Table 2. Thus, even after controlling for potential lack of independence across the forecast attributes, we find that audit fees are higher in firms with more frequent forecasts, with more specific forecasts, with longer-horizon forecasts and greater forecast accuracy. Because the results are qualitatively similar for forecast attributes and the residuals of forecast attributes, henceforth we report results for actual forecast attributes.

4.5. Effect of financial statement verification level on the market reaction to forecasts

We examine Hypothesis H2 by regressing the market reaction to management forecasts on excess audit fees. The Confirmation Hypothesis predicts a positive coefficient. We measure the market reaction by the absolute value of *CAR* (*ABS_CAR*) and also by abnormal volume (*ABVOL)*. Excess audit fees (*EX_FEES*) is the residual from a regression of log audit fees (*LN_FEES*) on the firm-level fee determinants in equation (1), excluding the disclosure proxy, and is lagged one year to capture the *ex ante* level of financial statement verification.[27]

Figure 2 plots the mean market reaction to management forecasts for each decile of excess audit fees. Panels A and B plot *ABS_CAR* and *ABVOL* respectively. Both panels reveal a positive univariate relation between the market reaction to management forecasts and excess fees, consistent with the hypothesis. The median values for the deciles display the same pattern.

(one from the actual values of the endogenous variable and the other from the instrument), R-squares are not readily interpretable and are not constrained to be non-negative.

[27] Untabulated results reveal that our conclusions are robust to using the rank of *EX_FEES*.

To control for other determinants of the market reaction to forecasts, we estimate the following multivariate regressions:

$$ABS\_CAR_{i,t} = \delta_0 + \delta_1 EX\_FEES_{i,t-1} + \delta_2 MVE_{i,t} + \delta_3 LEV_{i,t} + \delta_4 MB_{i,t} + \delta_5 ANALYST_{i,t} + \delta_6 RETSTD_{i,t} + \delta_7 LIT_{i,t} + e_{i,t}$$

$$ABVOL_{i,t} = \mu_0 + \mu_1 EX\_FEES_{i,t-1} + \mu_2 MVE_{i,t} + \mu_3 LEV_{i,t} + \mu_4 MB_{i,t} + \mu_5 ANALYST_{i,t} + \mu_6 RETSTD_{i,t} + \mu_7 LIT_{i,t} + y_{i,t} \quad (3)$$

Following prior studies, we control for the log of market value of equity (*MVE*), leverage (*LEV*), market-to-book (*MB*), the log of number of analysts following the stock (*ANALYST*), volatility of stock returns (*RETSTD*), and the litigation risk indicator (*LIT*).

Panel A of Table 4 presents results for the absolute value of *CAR* (*ABS_CAR*) and abnormal trading volume (*ABVOL*). The coefficients on *EX_FEES* are positive (0.432 and 0.163) and significant (*t*-statistics of 6.51 and 4.92). A one standard deviation (0.706) increase in excess audit fees is associated with a 9.81% increase in stock price reaction and a 10.31% increase in trading volume. These results are consistent with the hypothesis that the market reaction to management forecasts increases in the level of financial statement verification.

To check whether the result is due to a relation between audit fees and the magnitude of forecast surprises, rather than forecast credibility, we estimate the following regression:

$$CAR_{i,t} = \theta_0 + \theta_1 SURP_{i,t} + \theta_2 SURP_{i,t} * EX\_FEES_{i,t-1} + \theta_3 EX\_FEES_{i,t-1} + \theta_4 MVE_{i,t} + \theta_5 LEV_{i,t} + \theta_6 MB_{i,t} + \theta_7 ANALYST_{i,t} + \theta_8 RETSTD_{i,t} + \theta_9 LIT_{i,t} + e_{i,t} \quad (4)$$

where $SURP_{i,t}$ measures the new information in the management forecast, computed as the difference between the forecast (or midpoint if it is a range) and the most recent mean consensus

analyst forecast, scaled by the absolute value of the consensus analyst forecast.[28] We retain only point and range forecasts in this analysis.

The results in Panel B of Table 4 indicate a significantly positive coefficient on *SURP*, consistent with prior research that management forecasts are informative. More importantly, the positive and significant coefficient of 0.063 on the interactive term *SURP*EX_FEES* implies that the market reaction to the forecast surprise increases by approximately 50% between the first and third quartiles of *EX_FEES*.[29] Thus, even after controlling for the magnitude of the forecast surprise, the market reaction to a management forecast increases substantially in the extent of financial statement verification, consistent with the Confirmation Hypothesis.[30]

To check whether these results differ between good and bad news disclosures, we split the sample into two sub-samples according to the sign of forecast surprise (*SURP*), and estimate Equations (3) and (4) separately for each. Untabulated results reveal a significantly positive coefficient on *EX_FEES* and on *SURP*EX_FEES* for both sub-samples and provide little evidence that the relevance of audit verification is different between good and bad forecast news.

5. Alternative explanation: *Litigation Risk hypothesis*

One potential explanation for an association between management forecasts and audit fees documented in Table 3 is that litigation risk is a correlated omitted variable in the audit fee regression. We refer to this alternative possibility as the Litigation Risk Hypothesis. There are

[28] Consensus analyst forecast data are from the IBES Details file. The results are robust to scaling management forecast surprise by the average stock price at the end of day -2 relative to the forecast date, or by the average stock price over days -45 to -10 relative to the forecast date. They are robust to using the median instead of mean analyst forecast and to interacting *SURP* with the control variables *MVE, LEV, MB, ANALYST, RETSTD* and *LIT*.

[29] Rogers and Van Buskirk (2009) document that management forecasts are increasingly released concurrently with earnings announcements. When such "bundled forecasts" are excluded, the results in Table 4 remain qualitatively unchanged except for the *ABVOL* regression results, where the coefficient on *EX_FEES* becomes insignificant.

[30] The positive relation between excess audit fees and the market reaction to management forecasts is inconsistent with high fees reducing auditor independence, as claimed by Kanagaretnam et al. (2010) among others.

two reasons to be concerned that litigation risk links audit fees to earnings forecasting activity, even after controlling for other determinants of audit fees. First, prior studies find that firms with greater litigation risk pay higher audit fees (e.g., Simunic (1980), Dye (1993), Lys and Watts (1994), Shu (2000)) and make more voluntary disclosures (e.g., Skinner (1994), Field et al. (2005)). To the extent that the other control variables in the audit fee regressions do not entirely control for litigation risk, one could observe an association between audit fees and earnings forecasting activity. Second, auditors could view firms making earnings forecasts as potentially more risky audits, because they are more likely to use forecasting to manipulate their stock price, or to engage in earnings management to meet their forecasts (e.g., Krishnan, Pevzener and Sengupta (2009)). Moreover, to the extent to which forecast accuracy can be obtained through earnings management, it could be correlated with litigation risk.

Against this alternative hypothesis, it is not clear that there is a positive relation between litigation risk and voluntary disclosure. Field et al. (2005) report that voluntary disclosure actually reduces litigation risk, once the endogeneity between litigation risk and disclosure is accounted for, consistent with our priors. In addition, voluntary disclosure (as distinct from financial reporting) typically is associated with litigation against managers, not auditors, and hence seems unlikely to have a substantial effect on audit fees. Nevertheless, we entertain the possibility that litigation risk could lead to a positive relation between excess audit fees and both the quality and quantity of management forecasts.

To distinguish between the explanations, we split the sample into two equal groups based on an ex-ante measure of litigation risk and compare the relation between audit fees and forecast characteristics between groups.[31] Litigation risk predicts that the relation between audit fees and

[31] We obtain identical conclusions when we estimate audit fee regression using OLS with two-way clustered standard errors and include litigation risk as an interactive variable in the regression.

management forecasts is more pronounced in the high litigation sub-sample, whereas the confirmation hypothesis makes no clear prediction.

To compute ex-ante litigation risk, we first identify firms that have been named in securities class-action lawsuits and then estimate the following prediction model, which uses firm-level determinants of litigation risk identified in prior studies (e.g., Lys and Watts (1994), Shu (2000), Johnson et al. (2001)) as predictor variables:[32]

$$\Pr(LAW = 1) = G(\alpha_0 + \alpha_1 SIZE_{i,t} + \alpha_2 RET_{i,t} + \alpha_3 RETSTD_{i,t} + \alpha_4 TURN_{i,t} + \alpha_5 MB_{i,t} + \alpha_6 CLIENT\_VOL_{i,t} + \alpha_7 NBR\_CLIENTS_{i,t} + \alpha_8 DOL\_AUDIT_{i,t} + \alpha_9 OPINION_{i,t} + \alpha_{10} LIT_{i,t} + \sigma_{i,t}) \quad (5)$$

where the variables are defined as:

LAW	Indicator denoting a securities class action lawsuit during the year
SIZE	Log of market value of equity
ANNRET	Annual stock return during the year
RETSTD	Standard deviation of daily stock returns in the year
TURN	Stock turnover
MB	Market to book ratio
CLIENT_VOL	Variance of the auditor's client size
NBR_CLIENTS	Number of clients of the auditor
DOL_AUDIT	The total sales dollars that the auditor audits
OPINION	Indicator variable, taking a value of 1 for unqualified audit opinions
LIT	High litigation risk industry, as identified in prior studies.[33]

Panel A of Table 5 describes the prediction model. It is estimated using Probit, and qualitatively similar results are obtained using Logit. Results are consistent with prior studies: the likelihood of litigation is greater for firms that are larger, experience poor stock performance, are more volatile, have greater turnover, and operate in high risk industries (bio-technology,

[32] Firms named in securities class-action lawsuits are from the *Securities Class Action Clearinghouse* database maintained by Stanford Law School in co-operation with Cornerstone Research. See: http://securities.stanford.edu/.
[33] Prior studies have identified firms that operate in the bio-technology (SIC code 2833-2836 and 8731-8734), computing (SIC codes 3570-3577 and 7370-7374), electronics (SIC codes 3600-3674) and retailing (SIC codes 5200-5961) industries to be more prone to litigation risk (e.g., Francis et al. (1994), Shu (2000), Johnson et al. (2001), Field et al. (2005), Rogers and Stocken (2005)).

computing, electronics and retailing). Several of the auditor related variables also are significant, suggesting that the prediction model captures auditor litigation risk specifically. Firms are more likely to be sued when the auditor audits a wide cross-section of client sizes, audits more clients, audits fewer sales dollars, and issues an unqualified audit opinion. The explanatory power of the model is 0.14, which is slightly higher than the 0.12 of Rogers and Stocken (2005).

Panels B, C and D of Table 5 present results from estimating Equations (1) and (2) for the high and low-litigation-risk groups. The coefficients on *FREQUENCY*, *SPECIFICITY*, and *HORIZON* in the audit-fee regressions are significantly positive in both the high and low litigation sub-samples. But more importantly, the coefficient on these variables always is lower for the high litigation-risk group than for the low litigation-risk group, which is inconsistent with the litigation risk hypothesis.[34] For instance, the coefficient on *FREQUENCY* is 0.19 for the high-litigation group, while it is over four times larger at 0.81 for the low-litigation-risk group. Moreover, consistent with the high litigation group facing greater litigation risks for auditors, the coefficient on most control variables in the audit fee regression are larger in magnitude for the high litigation group than for the low litigation group. The smaller coefficient primarily for the voluntary disclosure variables is inconsistent with the litigation risk explanation.[35]

Panel E presents results from estimating Equations (1) and (2) with ex-post *ACCURACY* as the forecast attribute. The coefficient on *ACCURACY* is greater for the higher litigation risk group, which possibly reflects the fact that *ACCURACY* is correlated with the magnitude of surprise at earnings announcements and the higher likelihood of larger surprises attracting

[34] We cannot test for differences in coefficients between the high and low litigation risk groups in a 3SLS context, but confirm that the differences in coefficients are significantly lower for high-litigation risk group using OLS.

[35] In untabulated results, we examine whether the market reaction to management forecasts varies with litigation risk, which could act as a disciplining mechanism. The reaction is a significantly decreasing function of litigation risk, irrespective of controlling for the magnitude of the forecast surprise.

litigation. Nonetheless, we cannot rule out the possibility that the positive correlation between *ACCURACY* and audit fees is due to litigation risk.

6. Robustness tests

We conduct a battery of robustness checks, using alternative model specifications and alternative proxies for resources used by firms in financial statement verification and in management forecasting. We discuss these tests below.

6.1. Cross-sectional regression with one observation per firm

Inferences from primary 3SLS regressions might be affected by potential serial-correlation from unobserved firm-specific effects, so we first estimate a cross-sectional regression that uses one observation per firm, namely, the time-series average of each variable.[36]

Panel A of Table 6 summarizes the 3SLS regression of audit fees and management forecast proxies while panels B and C report the estimates from regression of the market reaction to management forecasts on excess audit fees. The number of observations corresponds to the number of unique firms in the sample: 9,172 for *FREQUENCY*, 2,280 for *SPECIFICITY* and *HORIZON* and 1,897 for *ACCURACY*. Consistent with the earlier results, the coefficients of all three ex-ante forecast variables are positive and significant in the audit fees regressions. However, the coefficient on ex-post forecast accuracy now is insignificant, possibly due to the sample being limited in size to the firm-years with point or range forecasts.

In panel B of Table 6, the relations of absolute *CAR* and abnormal volume with excess audit fees also are robust to the cross-sectional specification. The coefficient of *EX_FEES* is

[36] As an alternative control for serial correlation, we estimate OLS regressions using a random-effects model with AR (1) residual, as in Baltagi and Wu (1999). The results are qualitatively unchanged.

positive (0.355 and 0.144) and significant (*t*-statistics = 5.53 and 5.88 respectively) in the *ABS_CAR* and the *ABVOL* regressions respectively, which are comparable to the coefficients and *t*-statistics reported in Table 4. Finally, Panel C of Table 6 reports that the effect of excess audit fees on the market reaction to forecast surprises (*SURP*) is robust to the cross-sectional specification. The coefficient on *SURP*EX_FEES* is a significantly positive 0.087 (*t*-stat=2.31). These results allay fears that our conclusions drawn from the 3SLS analysis are substantially affected by serial correlation.

6.2. Alternative estimation approaches and empirical specifications

We next examine the robustness of our results to using alternative estimation approaches and empirical specifications. A case for alternative estimation approaches is made by Larcker and Rusticus (2010), who note that IV estimators such as 3SLS are not always preferable to OLS. We also consider alternative specifications because our results could be viewed as being confounded by uncontrolled firm-specific variables associated with both management forecasts and audit fees. For example, Ajinkya et al. (2005) and Karamanou and Vafeas (2005) conclude that governance structure (including board structure) affects firms' voluntary disclosure behavior, and Carcello et al. (2002) conclude that board structure is associated with audit fees. Failure to control for all firm characteristics that determine both audit fees and voluntary disclosures therefore might seem to create an endogeneity bias.

Nevertheless, we are wary of over-controlling for variables correlated with audit fees and voluntary disclosure, because they may not be truly exogenous. We recognize – indeed hypothesize – that firms' decisions relating to auditing, disclosure, corporate governance and internal control mechanisms are likely to be jointly determined. It undoubtedly would be

desirable to have an all-inclusive structural model of the joint decisions and then derive a reduced form model from the structural equations. That is a tall order. As Fisher (1953, p. 211) notes: "to construct this sort of a (comprehensive) model in some theoretical sense is difficult enough; but then to attempt to treat it statistically brings up further obstacles, especially in view of the limitations imposed by the analytical tools and basic data ... ." Thus, our concern is that in the absence of knowing the true structural model, controlling for endogenous factors could obscure the true association between the variables of interest. In spite of this concern, and for completeness, we report below a variety of alternative specifications.

First, we estimate an OLS regression with standard errors that are clustered two-way by firm and by year. These results are presented in panel A of Table 7. In the audit fee regression, the coefficients on *FREQUENCY*, *SPECIFICITY*, *HORIZON* and *ACCURACY* are all positive and significant. The coefficients are 0.081, 0.120, 0.111 and 0.005 and the *t*-statistics are 6.11, 3.26, 6.21 and 2.43 respectively. These results suggest that the relation between audit fees and management forecast properties is robust to using an OLS regression with two-way clustered standard errors. The coefficient on *LN_FEES* is positive and significant in the three of the four forecast regressions.

Second, we estimate firm-fixed effects regressions to control for omitted time-invariant firm-specific factors. We hasten to add that this analysis could lower the power of the tests. Our primary thesis is that auditing verification standards and disclosure policy are complementary, and hence jointly determined by a set of firm-specific determinants. Since both audit verification levels and disclosure policies are relatively stable over time, their firm-specific determinants also are likely to be relatively time invariant, so controlling for firm-fixed effects risks inappropriately controlling for unobserved time-invariant determinants of our explanatory

variables. Nonetheless, we conduct the analysis to examine whether the relation between excess audit fees and forecast attributes reported above is entirely explained by time-invariant factors.

These results are presented in panel B of Table 7. The coefficient on all four forecast attributes continue to be positive and significant in the audit fees regressions, indicating that the effect of forecast properties on audit fees is robust to including firm fixed effects. Moreover, consistent with our expectation that firm-fixed effect over-control for the time-invariant determinants, the coefficients on *FREQUENCY*, *SPECIFICITY* and *HORIZON* decline by over 20% in these regressions as compared to those in panel A of Table 7. These results suggest that our earlier results are partially but not entirely explained by omitted time-invariant factors.[37]

Third, in panel C of Table 7 we verify the results are robust to using 2SLS, clustering the standard errors by firm. Here too, the coefficients on all forecast properties (*FREQUENCY*, *SPECIFICITY*, *HORIZON* and *ACCURACY*) are positive and significant in the audit fees regressions. Further, the coefficient on *LN_FEES* is positive and significant in two of the four specifications in the forecast regressions. Overall, the effects of forecast properties on audit fees and of audit fees on forecast properties are robust to alternative empirical specifications.

6.3. Robust regression

We estimate a robust regression to verify that the results are not driven by outliers. Robust regression uses iteratively reweighted least squares and assigns higher weights to better-behaved observations (Baker and Hall, 2004). Results are not tabulated. The coefficients on *FREQUENCY*, *SPECIFICITY, HORIZON* and *ACCURACY* in the audit fee regressions are significantly positive. In both market reaction regressions (absolute *CAR* and abnormal volume), the coefficient on *EX_FEES* continues to be positive and significant. In the regression of *CAR*

[37] Unreported results using firm-fixed effects in the market reaction tests are similar. The coefficient on *EX_FEES* is positive (0.579 and 0.206) and significant (*t*-statistics 12.57 and 12.44) in the *ABS_CAR* and *ABVOL* regressions.

on forecast surprise interacted with excess fees, the coefficient on *SURP*EX_FEES* is 0.041 and the *t*-statistic is 3.66. We conclude that outliers do not noticeably affect the estimated relation between audit fees and either management forecasts or the market reaction to them.

6.4. Non-audit fees

Several studies suggest that audit fees are negatively correlated with non-audit fees due to joint economies or to audit firms pricing audits as a loss leader for non-audit work (e.g., Simunic (1984), Palmrose (1986) and Becker et al. (1998)). However, Abdel-Khalik (1990), Barefield et al. (1993), and O'Keefe et al. (1994) find an insignificant relationship between audit and non-audit fees, while Simunic (1984), Ezzamel et al. (1996) and Firth (1997) document a positive relation. To test whether our results are affected by any such correlation, we include either the amount of non-audit fees or an indicator dummy for their existence as an additional explanatory variable in the audit fee regressions. The results are qualitatively unchanged.

6.5. Sample selection bias

Analyses of forecast specificity, horizon and accuracy are restricted to those firms that issue management forecasts. To check the robustness of our results to self-selection bias, we use a Heckman 2-stage approach. In the first stage, we estimate a Probit regression of an indicator variable for forecasting firms on firm-specific characteristics.[38] In the second stage, we estimate audit fees as an OLS regression including an Inverse Mills Ratio estimated from the first stage regression. The results are presented in Table 8. In the Probit regression, all explanatory variables are significantly related to forecasting tendency in the predicted manner. In the second stage, the Inverse Mills Ratio is positive but insignificant in the *SPECIFICITY* and *HORIZON* regressions, suggesting selection bias might not play a substantial role when studying a sample

[38] The dependent variable in the first-stage Probit model for *ACCURACY* takes the value 1 for only point or range forecasts, as only these forecasts are included in the 2nd stage regression for *ACCURACY*. We do not report the Probit results for analysis of *ACCURACY* as they are qualitatively similar to those reported in Table 8.

of forecasters. Selection bias is evident for point and range forecasts, as the Inverse Mills ratio is significant in the *ACCURACY* regression. However, controlling for the bias leaves the conclusions largely unchanged, because the coefficients on *SPECIFICITY, HORIZON* and *ACCURACY* remain positive and significant in the audit fees regressions. Thus, even though the sample of forecasters is not random, our earlier results do not appear to be attributable to firms self-selecting in issuing management forecasts.

6.6. Choice of auditor as an alternate measure of financial statement verification

Prior studies have observed that Big Five auditors provide superior audit quality (e.g., DeAngelo (1981), Willenborg (1999)). This raises the possibility that firms employ Big Five auditors to ensure a higher verification standard for their financial reporting and thereby increase the reliability of their management forecasts. To test this idea, Table 9 reports a Probit regression of the choice of auditor type on *FREQUENCY* and the following control variables: size (*LN_ASSETS*), profitability (*ROA*), leverage (*LEV*), asset turnover (*ASSET_TURN*), market-to-book ratio (*MB*) and capital expenditure scaled by total assets (*CAPEX*). We do not report the results for *SPECIFICITY* and *HORIZON* because they have small samples, 93% of which employ Big Five auditors.[39] The control variables generally are significant, with the exception of *MB*. Larger firms and firms with greater turnover and capital expenditure are more likely to hire a Big Five auditor, while firms that are more profitable and more levered are less likely. These results are broadly in line with those reported in Lai (2009), among others. More importantly, the coefficient on *FREQUENCY* is a significant 0.108 (t-statistic = 6.70). This is consistent with our earlier evidence based on audit fees, and supports the contention that firms issuing management forecasts are more likely to employ higher quality Big-Five auditors.

[39] By comparison, less than 70% of firms not making management forecasts employ Big Five auditors.

6.7. Reliability of management forecasts after the Sarbanes Oxley Act

The Sarbanes Oxley Act (SOX) introduced several requirements aimed at improving audit verification standards, such as enhanced auditor independence, monitoring and rotation of auditors, requiring auditors to assess internal control weaknesses, etc. The introduction of this Act provides an interesting setting to examine the effect of allegedly enhanced audit verification standards on forecast reliability, and also provides an alternative proxy for verification standards.

We study the effect of SOX on investors' responses to management forecasts by re-estimating regression equations (5) and (6) after replacing *EX_FEES* with an indicator variable *POST* that takes the value 1 for the years 2004 to 2007. We also exclude forecasts made in 2002 and 2003 to clearly distinguish the periods before and after SOX became effective in practice. Results are reported in Table 10. In Panel A, the coefficients from regressions of absolute abnormal returns and abnormal volume around forecasts on $POST_{it}$ are positive and significant. In Panel B, the coefficient on the interactive variable *SURP*POST* in a regression of *CAR* on forecast surprise (*SURP*) also is positive and significant at the 10% level. These results indicate that investors respond more to management forecast surprises in the post-SOX period, consistent with increased audit verification standards increasing reliability of management forecasts. While this result is consistent with the confirmation hypothesis, we recognize that the introduction of SOX is endogenous to the relatively unique events during that period, which could explain the results.

7. Conclusions

This paper examines the hypothesis that audited financial reporting and voluntary disclosure of managers' private information are complementary mechanisms for communicating

with investors, not substitutes. We test the hypothesis in Ball (2001) that independent verification and reporting of financial outcomes encourages managers to be more truthful and hence more precise in their disclosures. This allows managers to credibly disclose private information that is not directly verifiable, alleviating the problem (Crawford and Sobel, 1982) that private information disclosure as a stand-alone mechanism is uninformative because in equilibrium it is untruthful.

Consistent with the hypothesis, we show that the resources firms commit to financial statement verification by independent auditors are an increasing function of the extent of their management forecasting activity, and that the market reaction to forecasts increases in the resources committed to audit. Additional tests suggest the relations are not driven by litigation risk and are robust to alternative empirical specifications. These results imply that firms commit to greater auditor financial statement authentication when their managers put more resources into forecasting by making more frequent and more informative voluntary forecasts, and that investors then perceive the forecasts to be more credible. Thus, financial statement verification enhances the information value of management forecasts. In other words, the signals are complements, not substitutes.

These results contribute to our understanding of the economic role of financial reporting, and of the criteria that are relevant to accounting standard-setting. Because audited financial reporting and private information disclosure are complements, their economic roles cannot be evaluated separately by researchers, regulators or standard-setters.

One implication of complementarity is that the timeliness with which investors and other parties become informed does not bear a one-for-one correspondence with the timeliness of financial statement information. For example, incorporating unverifiable expectational

information into the financial statements feasibly could reduce their stand-alone reliability and at the same time reduce the quantity of private information disclosed by managers by impacting their ability to credibly commit to truthfulness. Researchers who interpret the low correlation between earnings announcements and short-window announcement-period returns as evidence of sub-optimal financial standards (notably, Lev 1989) are overlooking important confirmation effects. Similarly, bid-ask spread reactions during "announcement periods" are not sufficient measures of financial reporting effects on capital markets because audited financial reporting indirectly affects information released at other times and through other media, and hence potentially effects spreads at all times. We propose that optimal financial reporting is constrained to a subset of information that is independently verifiable, and hence primarily backward-looking and less timely when considered in isolation. This allows managers to increase the quantity of credible forward-looking, timely private information they disclose. Because audited financial reporting and private information disclosure complement each other in this fashion, their economic roles cannot be evaluated separately by researchers, regulators or standard-setters.

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Table 1: Descriptive statistics

Panel A of this table presents descriptive statistics for variables used in the regressions. The sample comprises firms with audit fee data available on Audit Analytics and covers the period 2000 to 2007. *FREQUENCY* indicates the number of management forecasts made during the year. For firm/years with forecasts, *SPECIFICITY* takes values from 1 to 4: point estimates, range estimates, open-ended estimates and qualitative estimates are assigned the values 4, 3, 2 and 1 respectively. *HORIZON* is defined as the log of one plus the difference in days between the fiscal period end date and the forecast date, and is populated only for firms making a forecast. *ACCURACY* indicates forecast accuracy defined as minus one times the absolute value of the difference between actual earnings and forecasted earnings scaled by the absolute value of actual earnings. The amount of annual audit fees in $millions is indicated by *AUDIT_FEES*. *LN_FEES* is the log of *AUDIT_FEES*. *ASSETS* represents total assets in $millions. *ROA* is net income divided by total assets. *ACCR* indicates the absolute value of accruals (measured as the difference between cash flow from operations and net income) divided by total assets. *CURRENT* denotes current assets (computed by summing cash, receivables and inventory) as a proportion of total assets. *FOREIGN* is the ratio of foreign sales to total sales. The number of business segments is captured by *SEG*. *LIAB* represents total liabilities divided by total assets. *LOSS* and *DEC* are dummy variables that indicate whether or not the firm-year reported a loss and has a December year end, respectively. *LAG* denotes reporting lag and is computed as the number of days between the earnings announcement date and the respective fiscal period end date. *EARNVOL* denotes earnings volatility and is computed as the standard deviation of five annual earnings (scaled by total assets). *RETVOL* indicates stock return volatility and is computed similarly to *EARNVOL* as the standard deviation of five annual stock return observations. *ANALYST* represents analyst following and is computed as the log of one plus the number of analysts covering the firm. *ISSUE* is an indicator variable that denotes whether or not the firm issues either debt or equity securities in the current or in the subsequent year.

Panel B presents descriptive statistics for variables used in regressions involving the stock market reaction to management forecast announcements. For inclusion in this analysis, firm-years must have both audit fee data on Audit Analytics and at least one management forecast. *CAR* denotes cumulative abnormal returns and *ABVOL* denotes abnormal trading volume. in the 3-day window surrounding the management forecast date. *CAR* is defined as the cumulative stock returns in excess of the value-weighted market return in event window (days -1 to +1) around the management forecast date (day 0), scaled by the standard deviation of excess returns during the non-announcement period (days -45 to -10). *ABVOL* is the difference between the average log turnover in the event window and the average log turnover in the non-announcement period, scaled by the standard deviation of log turnover in the non-announcement period. *MVE* denotes the market value of equity in $millions. *LEV* indicates leverage defined as total debt divided by total assets. *MB* is the market-to-book ratio defined as the market value of equitydivided by the book value of equity. *ANALYST* represents analyst following and is computed as log of one plus the number of analysts covering the firm. *RETSTD* indicates stock return volatility and is measured as the standard deviation of daily returns during a fiscal year. *LIT* indicates industries with high litigation risk (i.e., in SIC codes 2833-2836, 3570-3577, 3600-3674, 5200-5961, 7370-7374 and 8731-8734).

Table 1 (cont'd)

Panel A: Audit fees sample

Variables	Obs.	Mean	Median	Std dev	Min	Max
FREQUENCY	44,883	0.66	0.00	1.55	0.00	7.00
SPECIFICITY	8,869	2.89	3.00	0.64	1.00	4.00
HORIZON	8,869	4.79	5.11	0.86	0.69	6.12
ACCURACY	7,342	-3.38	-2.01	6.05	-88.46	0.00
AUDIT_FEES	44,883	1.16	0.31	2.62	0.01	24.08
LN_FEES	44,883	12.75	12.63	1.52	9.12	17.00
ASSETS	44,883	3769.29	244.12	14904.28	0.06	178000.00
ROA	44,883	-0.31	0.01	1.50	-18.42	0.46
ACCR	44,883	0.26	0.07	0.99	0.00	12.07
CURRENT	44,883	0.48	0.48	0.27	0.00	1.00
FOREIGN	44,883	0.27	0.00	0.40	0.00	1.00
SEG	44,883	4.68	3.00	4.26	1.00	21.00
LIAB	44,883	0.79	0.54	1.73	0.03	20.76
LOSS	44,883	0.40	0.00	0.49	0.00	1.00
DEC	44,883	0.72	1.00	0.45	0.00	1.00
LAG	44,883	60.18	53.00	32.63	16.00	269.00
EARNVOL	44,883	1.10	0.07	7.09	0.00	101.33
RETVOL	44,883	1.56	0.48	5.67	0.05	66.53
ANALYST	44,883	1.01	0.85	1.01	0.00	3.35
ISSUE	44,883	0.70	1.00	0.46	0.00	1.00

Panel B: Market reaction sample

Variables	Obs.	Mean	Median	Std dev	Min	Max
CAR	26,282	0.00	0.06	4.31	-15.26	14.55
ABVOL	26,282	1.12	1.02	1.15	-1.55	4.76
MVE	26,282	7973.69	1497.64	26902.16	0.03	398000.00
LEV	26,282	0.22	0.20	0.18	0.00	0.84
MB	26,282	1.99	1.66	1.11	0.64	8.23
ANALYST	26,282	2.05	2.14	0.80	0.00	3.67
RETSTD	26,282	0.11	0.09	0.07	0.03	0.59
LIT	26,282	0.35	0.00	0.48	0.00	1.00

Table 2: Pairwise correlations

This table presents pairwise Spearman correlations among variables in the audit fee regression (Panel A) and in regressions of stock market reactions to management forecasts (Panel B). *FREQUENCY* is the number of management forecasts made during the year. *SPECIFICITY* is forecast specificity. *HORIZON* measures the time between the dates of the forecast and the fiscal period end. *ACCURACY* indicates forecast accuracy. *AUDIT_FEES* is audit fees in $millions. The log of annual audit fees is indicated by *LN_FEES*. *LN_ASSETS* is the log of total assets in $millions. *ROA* is net income divided by total assets. *ACCR* is the absolute value of accruals divided by total assets. *CURRENT* is current assets (computed by summing cash, receivables and inventory) as a proportion of total assets. *FOREIGN* is the ratio of foreign sales to total sales. The number of business segments is *SEG*. *LIAB* is total liabilities divided by total assets. *LOSS* and *DEC* are dummy variables that indicate whether or not the firm incurred a loss and has a December year end, respectively. *EX_FEES* is the residual of the regression of audit fees on firm-level determinants identified in equation (1) but excluding the forecast proxies. *ABS_CAR* and *ABVOL* measure the absolute value of the cumulative abnormal returns and abnormal trading volume respectively in the 3-day window surrounding the management forecast date. *MVE* denotes the log of market value of equity. *LEV* indicates leverage defined as total debt divided by total assets. *MB* is the market-to-book ratio defined as the market value of assets divided by the book value of assets. *ANALYST* represents analyst following. *RETSTD* is stock return volatility measured as the standard deviation of daily returns. *LIT* indicates industries with high litigation risk (i.e., in SIC codes 2833-2836, 3570-3577, 3600-3674, 5200-5961, 7370-7374 and 8731-8734). Detailed variable definitions are in Table 1. Correlations indicated by ***, **, * are significant at the 1%, 5% and 10% levels respectively.

Variables	*FREQUENCY*	*SPECIFICITY*	*HORIZON*	*ACCURACY*	*LN_FEES*	*LN_ASSETS*	*ROA*	*ACCR*	*CURRENT*	*FOREIGN*	*SEG*	*LIAB*	*LOSS*	*DEC*
FREQUENCY	1.00													
SPECIFICITY	0.11***	1.00												
HORIZON	0.16***	0.06***	1.00											
ACCURACY	-0.14***	-0.01	-0.55***	1.00										
LN_FEES	0.33***	0.08***	0.15***	-0.11***	1.00									
LN_ASSETS	0.32***	0.03***	0.13***	-0.14***	0.81***	1.00								
ROA	0.24***	0.08***	0.07***	-0.06***	0.32***	0.41***	1.00							
ACCR	-0.10***	-0.06***	-0.09***	0.05***	-0.24***	-0.41***	-0.38***	1.00						
CURRENT	-0.09***	-0.02*	-0.11***	0.14***	-0.22***	-0.31***	-0.09***	-0.03***	1.00					
FOREIGN	0.18***	-0.02*	-0.06***	0.04***	0.35***	0.21***	0.13***	-0.03***	0.04***	1.00				
SEG	0.14***	-0.04***	0.01	-0.06***	0.17***	0.15***	0.13***	0.00	-0.17***	0.20***	1.00			
LIAB	-0.05***	0.00	0.12***	-0.13***	0.09***	0.16***	-0.21***	0.04***	-0.16***	-0.14***	-0.08***	1.00		
LOSS	-0.22***	-0.11***	-0.12***	0.12***	-0.31***	-0.47***	-0.82***	0.45***	0.09***	-0.06***	-0.08***	0.04***	1.00	
DEC	-0.07***	-0.04***	0.06***	-0.07***	0.09***	0.13***	-0.03***	-0.05***	-0.11***	-0.04***	-0.02***	0.10***	-0.01**	1.00

Table 2 (cont'd)

Panel C: Market reaction sample

Variables	*EX_FEES*	*ABS_CAR*	*ABVOL*	*MVE*	*LEV*	*MB*	*ANALYST*	*RETSTD*	*LIT*
EX_FEES	1.00								
ABS_CAR	0.08***	1.00							
ABVOL	0.11***	0.48***	1.00						
MVE	0.13***	0.01	0.10***	1.00					
LEV	0.01***	-0.05***	-0.07***	0.17***	1.00				
MB	0.10***	0.06***	0.12***	0.31***	-0.29***	1.00			
ANALYST	0.05***	0.02***	0.13***	0.72***	-0.01	0.29***	1.00		
RETSTD	-0.22***	0.02***	0.00	-0.51***	-0.22***	-0.05***	-0.24***	1.00	
LIT	-0.05***	0.03***	0.07***	-0.04***	-0.28***	0.22***	0.17***	0.27***	1.00

Table 3: Relation between voluntary disclosures and audit fees – Three-stage Least Squares (3SLS)
The table presents estimates from the following set of simultaneous equations:

$$LN\_FEES_{i,t} = \beta_0 + \beta_1 DISCLOSE_{i,t} + \beta_2 LN\_ASSETS_{i,t} + \beta_3 ROA_{i,t} + \beta_4 ACCR_{i,t} + \beta_5 CURRENT_{i,t} + \beta_6 FOREIGN_{i,t} + \beta_7 SEG_{i,t} + \beta_8 LIAB_{i,t} + \beta_9 LOSS_{i,t} + \beta_{10} DEC_{i,t} + \beta_{11} LAG_{i,t} + \varepsilon_{i,t}$$

$$DISCLOSE_{i,t} = \gamma_0 + \gamma_1 LN\_FEES_{i,t} + \gamma_2 EARNVOL_{i,t} + \gamma_3 RETVOL_{i,t} + \gamma_4 ANALYST_{i,t} + \gamma_5 ISSUE_{i,t} + \sum Year + \sum Industry + \vartheta_{i,t}$$

where, *LN_FEES* is log of annual audit fees and *DISCLOSE* is the respective disclosure proxy (*FREQUENCY*, *SPECIFICITY*, *HORIZON* or *ACCURACY*). *FREQUENCY* indicates the number of management forecasts made during the year. *SPECIFICITY* captures the specificity of the forecast. *HORIZON* measures the time between the date of the forecast and the date of the fiscal period end. *ACCURACY* indicates forecast accuracy defined as minus 1 times the absolute value of the difference between actual earnings and forecasted earnings scaled by the absolute value of actual earnings. Panel B replaces the disclosure proxies with residuals from a first stage-OLS regression of the proxies on other forecast attributes (*FREQ_RES*, *SPECIF_RES, HORIZ_RES or ACCUR_RES*). In these first-stage regressions, *ACCURACY* is not considered as a control variable. *LN_ASSETS* represents the log of total assets in $millions. *ROA* is net income divided by total assets. *ACCR* indicates the absolute value of accruals divided by total assets. *CURRENT* denotes current assets (computed by summing cash, receivables and inventory) as a proportion of total assets. *FOREIGN* is the ratio of foreign sales to total sales. The number of business segments is captured by *SEG*. *LIAB* represents total liabilities divided by total assets. *LOSS* and *DEC* are dummy variables that indicate whether or not the firm incurred a loss and has a December year end respectively. *LAG* denotes reporting lag between the fiscal period end and the earnings announcement date. *EARNVOL* and *RETVOL* denote earnings volatility and stock return volatility and are defined as the standard deviation of annual earnings (scaled by total assets) and annual stock returns respectively. *ANALYST* represents analyst following and is computed as log of one plus the number of analysts covering the firm. *ISSUE* is an indicator variable that denotes whether or not the firm issues either debt or equity securities in the current or in the subsequent year. Industry fixed effects are defined at the 2-sigit SIC code level. Detailed variable definitions are in Table 1.

Table 3 (cont'd)
Panel A: Raw forecast variables

	Pred Sign	*FREQUENCY*				*SPECIFICITY*				*HORIZON*				*ACCURACY*			
		LN_FEES		*FREQUENCY*		*LN_FEES*		*SPECIFICITY*		*LN_FEES*		*HORIZON*		*LN_FEES*		*ACCURACY*	
		Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept		9.382	405.96	-2.674	-19.10	4.327	17.24	1.947	15.63	5.821	38.09	2.184	10.91	9.009	134.84	-3.178	-1.55
FREQUENCY	+	0.378	49.85														
SPECIFICITY	+					1.684	20.33										
HORIZON	+									0.731	22.55						
ACCURACY	+													0.052	10.54		
LN_ASSETS	+	0.454	195.07			0.507	60.47			0.498	75.49			0.557	82.33		
ROA	–	-0.055	-9.03			-0.069	-0.96			-0.020	-0.30			0.084	0.95		
ACCR	+	0.004	0.43			0.035	0.37			0.020	0.22			-0.058	-0.49		
CURRENT	+	0.112	7.21			0.303	6.71			0.343	8.50			0.295	6.64		
FOREIGN	+	0.470	46.81			0.532	23.84			0.580	29.08			0.602	27.46		
SEG	+	0.010	10.68			0.010	5.93			0.006	4.05			0.003	1.45		
LIAB	+	0.028	8.83			0.317	8.04			0.160	4.33			0.170	3.93		
LOSS	+	0.181	20.04			0.081	2.78			0.087	3.72			0.009	0.33		
DEC	+	0.075	8.83			0.143	8.17			0.114	7.05			0.124	6.66		
LAG	+	0.005	33.55			0.007	15.68			0.007	17.29			0.011	22.64		
LN_FEES	+			0.155	23.04			0.031	4.33			0.132	13.15			0.172	1.82
FREQUENCY	+															0.109	2.61
SPECIFICITY	+															0.163	0.97
HORIZON	+															-1.678	-17.94
EARNVOL	–			-0.001	-1.63			-0.002	-0.28			-0.007	-0.50			0.580	3.63
RETVOL	–			-0.002	-2.47			0.002	1.69			0.001	0.25			0.006	0.24
ANALYST	+			0.471	57.50			0.002	0.38			-0.038	-3.83			-0.015	-0.13
ISSUE	+			0.067	5.64			0.012	1.32			0.058	3.67			0.079	0.50
R^2		0.64		0.20		0.01		0.02		0.47		0.06		0.58		0.05	
Observations		44,883		44,883		8,869		8,869		8,869		8,869		7,342		7,342	

Table 3 (cont'd):
Panel B: Residual forecast variables

	Sign	*FREQ_RES*				*SPECIF_RES*				*HORIZ_RES*				*ACCUR_RES*			
		LN_FEES		*FREQ_RES*		*LN_FEES*		*SPECIF_RES*		*LN_FEES*		*HORIZ_RES*		*LN_FEES*		*ACCUR_RES*	
		Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept		10.022	148.78	-8.371	-23.41	9.353	118.10	-0.949	-7.59	9.411	145.85	-2.638	-13.08	9.193	96.95	-7.750	-6.07
FREQ_RES	+	0.435	29.02														
SPECIF_RES	+					1.686	19.30										
HORIZ_RES	+									0.708	21.47						
ACCUR_RES	+													0.225	16.49		
LN_ASSETS	+	0.425	56.52			0.517	61.83			0.506	77.52			0.526	52.14		
ROA	–	-0.176	-2.67			-0.061	-0.84			-0.013	-0.18			0.003	0.04		
ACCR	+	-0.193	-2.26			0.042	0.44			0.023	0.26			0.011	0.10		
CURRENT	+	0.248	6.36			0.309	6.78			0.347	8.58			0.236	4.70		
FOREIGN	+	0.484	25.18			0.539	23.94			0.586	29.29			0.495	19.98		
SEG	+	0.007	4.70			0.010	5.78			0.006	3.75			0.012	6.29		
LIAB	+	0.334	9.48			0.311	7.82			0.148	3.98			0.380	8.67		
LOSS	+	0.036	1.66			0.083	2.82			0.085	3.61			0.081	2.99		
DEC	+	0.182	11.71			0.140	7.88			0.109	6.68			0.159	8.50		
LAG	+	0.007	17.86			0.007	15.82			0.007	17.58			0.007	15.02		
LN_FEES	+			0.404	21.65			0.022	3.15			0.123	12.26			0.201	2.64
EARNVOL	–			0.004	0.17			-0.001	-0.14			-0.006	-0.44			0.258	2.83
RETVOL	–			0.002	0.37			0.003	1.73			0.001	0.24			0.024	1.76
ANALYST	+			0.177	9.98			-0.001	-0.20			-0.045	-4.47			-0.079	-1.20
ISSUE	+			0.034	1.28			0.011	1.21			0.058	3.64			-0.053	-0.61
R^2		0.43		0.15		0.01		0.01		0.49		0.06		-0.48		-0.03	
Observations		8,869		8,869		8,869		8,869		8,869		8,869		7,342		7,342	

Table 4: Relation between market reaction to disclosures and excess audit fees

The table presents estimates from the following regressions:

$$ABS\_CAR_{i,t} = \delta_0 + \delta_1 EX\_FEES_{i,t-1} + \delta_2 MVE_{i,t} + \delta_3 LEV_{i,t} + \delta_4 MB_{i,t} + \delta_5 ANALYST_{i,t} + \delta_6 RETSTD_{i,t} + \delta_7 LIT_{i,t} + e_{i,t}$$

$$ABVOL_{i,t} = \mu_0 + \mu_1 EX\_FEES_{i,t-1} + \mu_2 MVE_{i,t} + \mu_3 LEV_{i,t} + \mu_4 MB_{i,t} + \mu_5 ANALYST_{i,t} + \mu_6 RETSTD_{i,t} + \mu_7 LIT_{i,t} + y_{i,t}$$

$$CAR_{i,t} = \theta_0 + \theta_1 SURP_{i,t} + \theta_2 SURP_{i,t} * EX\_FEES_{i,t-1} + \theta_3 EX\_FEES_{i,t-1} + \theta_4 MVE_{i,t} + \theta_5 LEV_{i,t} + \theta_6 MB_{i,t} + \theta_7 ANALYST_{i,t} + \theta_8 RETSTD_{i,t} + \theta_9 LIT_{i,t} + e_{i,t}$$

Panels A and C presents the results for the first two regressions, while Panels B and D presents the results for the last regression. *ABS_CAR* and *ABVOL* measure the absolute value of the cumulative abnormal returns and abnormal trading volume respectively in the 3-day window surrounding the management forecast date. In Panel B, the dependent variable is the signed cumulative abnormal returns (*CAR*). *CAR* is defined as firm returns minus value weighted market return in the 3-day window surrounding the management forecast date, standardized by stock's return volatility in the pre-forecast-announcement period (i.e., days -45 to day -10 relative to the forecast announcement date). *EX_FEES* is excess audit fees defined as the residual of the regression of audit fees on firm-level determinants excluding the disclosure proxies. *MVE* denotes the log of market value of equity. *LEV* indicates leverage defined as total debt divided by total assets. *MB* is the market-to-book ratio defined as the market value of assets divided by the book value of assets. *ANALYST* represents analyst following and is defined as log of one plus the number of financial analysts following the firm. *RETSTD* indicates stock return volatility and is measured as the standard deviation of daily returns. *SURP* denotes forecast surprise and is defined as the difference between the management forecast value and the mean consensus analyst forecast scaled by the absolute value of the mean consensus analyst forecast. *LIT* indicates industries with high litigation risk (i.e., in SIC codes 2833-2836, 3570-3577, 3600-3674, 5200-5961, 7370-7374 and 8731-8734). Detailed variable definitions are in Table 1. All regressions report *t*-statistics based on robust standard errors clustered by firm and by year.

Panel A: Regression of absolute *CAR* and abnormal volume

	Pred. sign	*ABS_CAR*		*ABVOL*	
		Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept		3.288	16.50	0.636	6.72
EX_FEES	+	0.432	6.51	0.163	4.92
MVE	–	-0.092	-4.92	0.009	0.79
LEV	?	-0.488	-3.13	-0.264	-3.40
MB	+	0.070	2.41	0.059	5.62
ANALYST	–	0.180	3.68	0.141	6.01
RETSTD	?	0.216	0.24	0.126	0.31
LIT	?	0.054	0.69	0.085	2.48
Adj. R^2		0.01		0.04	
Observations		26,282		26,282	

Table 4 (cont'd)

Panel B: Regression of signed *CAR* on forecast news and excess audit fees

	Pred. sign	Mean forecast	
		Coeff.	*t*-stat.
Intercept		-0.897	-4.45
SURP	+	0.105	9.09
*SURP*EX_FEES*	+	0.063	3.41
EX_FEES	?	-0.040	-0.81
MVE	–	0.152	9.02
LEV	?	-0.575	-4.12
MB	+	0.188	3.59
ANALYST	–	-0.309	-8.60
RETSTD	?	-0.955	-1.34
LIT	?	0.051	0.37
Adj. R^2		0.01	
Observations		22,536	

Table 5: Role of litigation risk based on class-action lawsuits

Panels A and B of the table presents estimates from the following regressions respectively:

Panel A:

$$\Pr(LAW = 1) = G(\alpha_0 + \alpha_1 SIZE_{i,t} + \alpha_2 RET_{i,t} + \alpha_3 RETSTD_{i,t} + \alpha_4 TURN_{i,t} + \alpha_5 MB_{i,t} + \alpha_6 CLIENT\_VOL_{i,t} + \alpha_7 NBR\_CLIENTS_{i,t} + \alpha_8 DOL\_AUDIT_{i,t} + \alpha_9 OPINION_{i,t} + \alpha_{10} LIT_{i,t} + \sigma_{i,t}$$

Panel B:

$$LN\_FEES_{i,t} = \beta_0 + \beta_1 DISCLOSE_{i,t} + \beta_2 LN\_ASSETS_{i,t} + \beta_3 ROA_{i,t} + \beta_4 ACCR_{i,t} + \beta_5 CURRENT_{i,t} + \beta_6 FOREIGN_{i,t} + \beta_7 SEG_{i,t} + \beta_8 LIAB_{i,t} + \beta_9 LOSS_{i,t} + \beta_{10} DEC_{i,t} + \beta_{11} LAG_{i,t} + \varepsilon_{i,t}$$

$$DISCLOSE_{i,t} = \gamma_0 + \gamma_1 LN\_FEES_{i,t} + \gamma_2 EARNVOL_{i,t} + \gamma_3 RETVOL_{i,t} + \gamma_4 ANALYST_{i,t} + \gamma_5 ISSUE_{i,t} + \sum Year + \sum Industry + \vartheta_{i,t}$$

where, *LAW* indicates a securities class action lawsuit during the year, *SIZE* indicates the log of market value of equity. *RET* is annual stock return. *RETSTD* indicates stock return volatility and is measured as the standard deviation of daily returns. *TURN* represents stock turnover. The market-to-book ratio is denoted by *MB*. *CLIENT_VOL* is the variance of the auditor's client size. The number of clients audited by the auditor is captured by *NBR_CLIENTS*. *DOL_AUDIT* indicates the total sales dollars that the auditor audits. *OPINION* indicates an unqualified audit opinion. *LIT* represents industries with high litigation risk (i.e., in SIC codes 2833-2836, 3570-3577, 3600-3674, 5200-5961, 7370-7374 and 8731-8734), *High* (*Low*) *Litigation Risk* group consist of firms with a predicted value of litigation risk from panel A higher (lower) than the median. The other variables are as defined in Table 3. The *t*-statistics are based on robust standard errors clustered by firm and by year

Panel A: Litigation prediction model

	Pred. Sign	Probit	
		Coeff.	*z*-stat.
Intercept		-4.276	-27.40
SIZE	+	0.193	19.65
RET	–	-0.271	-10.02
RETSTD	+	2.273	16.49
TURN	+	0.667	7.60
MB	+	0.002	0.24
CLIENT_VOL	+	0.397	6.13
NBR_CLIENTS	?	0.002	7.38
DOL_AUDIT	?	0.000	-8.53
OPINION	?	0.090	2.96
LIT	+	0.094	2.35
Pseudo Adj. R^2		0.14	
Observations		36,187	

Table 5 (cont'd)

Panel B: *FREQUENCY*

	Pred. sign	*High Litigation Risk Group*				*Low Litigation Risk Group*			
		LN_FEES		*FREQUENCY*		*LN_FEES*		*FREQUENCY*	
		Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept		8.891	222.16	-3.413	-9.49	9.769	212.21	-3.542	-20.76
FREQUENCY	+	0.186	23.69			0.814	41.21		
LN_ASSETS	+	0.517	143.04			0.362	58.14		
ROA	–	-0.167	-6.90			-0.093	-4.49		
ACCR	+	-0.033	-0.88			0.102	3.20		
CURRENT	+	0.360	14.05			0.073	2.84		
FOREIGN	+	0.517	36.72			0.321	20.01		
SEG	+	0.001	0.68			0.010	6.64		
LIAB	+	0.245	13.24			0.036	2.51		
LOSS	+	0.034	2.24			0.140	9.99		
DEC	+	0.096	6.90			0.079	6.29		
LAG	+	0.007	27.06			0.004	19.05		
LN_FEES	+			0.178	12.62			0.258	20.89
EARNVOL	–			-0.009	-1.91			-0.004	-1.71
RETVOL	–			-0.005	-1.25			-0.001	-0.93
ANALYST	+			0.509	34.11			0.284	24.56
ISSUE	+			0.130	4.76			0.027	2.28
R^2		0.68		0.21		-0.09		0.09	
Observations		18,093		18,093		18,094		18,094	

Table 5 (cont'd)

Panel C: *SPECIFICITY*

	Pred. sign	*High Litigation Risk Group*				*Low Litigation Risk Group*			
		LN_FEES		*SPECIFICITY*		*LN_FEES*		*SPECIFICITY*	
		Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept		4.538	17.82	2.460	12.28	5.081	10.85	1.208	5.75
SPECIFICITY	+	1.495	18.32			1.685	9.82		
LN_ASSETS	+	0.536	55.50			0.429	20.25		
ROA	–	-0.088	-1.02			-0.210	-1.42		
ACCR	+	0.010	0.08			0.102	0.61		
CURRENT	+	0.337	6.17			0.237	3.14		
FOREIGN	+	0.567	21.45			0.476	11.94		
SEG	+	0.009	4.73			0.007	2.35		
LIAB	+	0.437	9.24			-0.002	-0.02		
LOSS	+	0.036	1.05			0.120	2.43		
DEC	+	0.154	7.13			0.101	3.47		
LAG	+	0.008	13.61			0.006	8.75		
LN_FEES	+			0.011	1.22			0.079	4.99
EARNVOL	–			-0.001	-0.14			0.013	0.76
RETVOL	–			0.001	0.48			0.004	1.85
ANALYST	+			-0.020	-2.55			0.058	4.70
ISSUE	+			0.015	1.21			0.016	1.10
R^2		0.18		0.03		-0.28		-0.02	
Observations		5,858		5,858		2,978		2,978	

Table 5 (cont'd)

Panel D: *HORIZON*

	Pred. sign	*High Litigation Risk Group*				*Low Litigation Risk Group*			
		LN_FEES		*HORIZON*		*LN_FEES*		*HORIZON*	
		Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept		6.142	39.12	1.937	5.89	6.423	23.60	1.749	5.30
HORIZON	+	0.608	18.15			0.706	12.06		
LN_ASSETS	+	0.518	65.05			0.470	32.70		
ROA	–	-0.046	-0.55			-0.186	-1.32		
ACCR	+	-0.018	-0.16			0.051	0.34		
CURRENT	+	0.399	8.15			0.254	3.76		
FOREIGN	+	0.617	25.89			0.535	15.01		
SEG	+	0.005	2.89			0.002	0.67		
LIAB	+	0.304	6.84			-0.232	-3.44		
LOSS	+	0.004	0.15			0.191	4.59		
DEC	+	0.113	5.64			0.090	3.25		
LAG	+	0.008	15.26			0.006	9.90		
LN_FEES	+			0.122	9.94			0.168	7.40
EARNVOL	–			-0.016	-0.99			0.031	0.96
RETVOL	–			0.000	-0.08			0.001	0.21
ANALYST	+			-0.041	-3.07			0.010	0.49
ISSUE	+			0.058	2.77			0.076	2.79
R^2		0.57		0.11		0.29		0.03	
Observations		5,858		5,858		2,978		2,978	

Table 5 (cont'd)

Panel E: *ACCURACY*

	Pred. sign	*High Litigation Risk Group*				*Low Litigation Risk Group*			
		LN_FEES		*ACCURACY*		*LN_FEES*		*ACCURACY*	
		Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept		8.726	107.62	-2.901	-0.92	9.328	74.04	6.409	1.96
ACCURACY	+	0.051	9.52			0.025	3.09		
LN_ASSETS	+	0.573	71.04			0.562	35.35		
ROA	–	0.109	1.10			0.149	0.68		
ACCR	+	0.074	0.54			-0.159	-0.65		
CURRENT	+	0.373	6.94			0.240	3.17		
FOREIGN	+	0.626	24.21			0.551	14.02		
SEG	+	0.002	0.89			0.000	0.06		
LIAB	+	0.358	7.04			-0.422	-5.19		
LOSS	+	-0.087	-2.66			0.283	5.10		
DEC	+	0.125	5.60			0.112	3.45		
LAG	+	0.011	17.85			0.010	12.87		
LN_FEES	+			0.134	1.17			-0.192	-0.95
FREQUENCY	+			0.137	2.70			0.013	0.17
SPECIFICITY	+			0.412	2.08			-0.766	-2.30
HORIZON	+			-1.693	-14.71			-1.748	-10.58
EARNVOL	–			0.686	3.92			0.182	0.38
RETVOL	–			-0.010	-0.28			0.022	0.60
ANALYST	+			-0.102	-0.67			0.132	0.57
ISSUE	+			0.089	0.45			0.185	0.69
R^2		0.62		0.06		0.45		0.12	
Observations		4,992		4,992		2,332		2,332	

Table 6: Cross-sectional regressions

The table presents results from cross-sectional regressions. The below regressions include only one observation per firm. For each firm, the variables are averaged over time and the cross-sectional regressions are estimated using these averages. The *t*-statistics are based on robust standard errors.

Panel A: Relation between audit fees and management forecasts – Three Stage Least Squares (3SLS)

		FREQUENCY				*SPECIFICITY*				*HORIZON*				*ACCURACY*			
	Sign	*LN_FEES*		*FREQUENCY*		*LN_FEES*		*SPECIFICITY*		*LN_FEES*		*HORIZON*		*LN_FEES*		*ACCURACY*	
		Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept		9.229	186.05	-1.294	-5.37	8.424	32.37	2.644	7.87	8.365	41.69	3.398	7.68	8.840	89.37	1.392	0.46
FREQUENCY	+	0.410	25.23														
SPECIFICITY	+					0.176	2.16										
HORIZON	+									0.127	3.09						
ACCURACY	+													0.007	0.91		
LN_ASSETS	+	0.457	101.76			0.525	60.95			0.522	60.15			0.528	54.46		
ROA	–	-0.052	-3.53			0.141	1.46			0.159	1.65			0.638	5.01		
ACCR	+	0.033	1.49			0.433	3.31			0.465	3.48			1.048	5.57		
CURRENT	+	0.082	2.71			0.304	5.45			0.300	5.45			0.320	5.29		
FOREIGN	+	0.561	27.29			0.749	24.14			0.748	24.47			0.711	21.45		
SEG	+	0.031	14.37			0.024	8.37			0.024	8.50			0.023	7.53		
LIAB	+	0.017	2.43			-0.012	-0.25			-0.025	-0.53			0.001	0.01		
LOSS	+	0.357	16.51			0.213	3.40			0.214	4.22			0.209	3.99		
DEC	+	0.051	3.20			0.053	2.07			0.049	1.97			0.082	3.04		
LAG	+	0.004	13.22			0.009	12.79			0.009	11.96			0.010	12.45		
LN_FEES	+			0.067	5.41			-0.016	-0.87			0.085	3.47			0.056	0.37
FREQUENCY	+															0.085	1.09
SPECIFICITY	+															0.697	2.64
HORIZON	+															-1.528	-10.21
EARNVOL	–			0.000	0.09			-0.017	-0.79			0.000	0.02			0.219	1.01
RETVOL	–			0.000	0.13			0.002	0.44			-0.011	-1.47			0.016	0.38
ANALYST	+			0.518	32.62			0.087	4.05			0.012	0.42			0.098	0.53
ISSUE	+			0.320	10.66			0.340	6.56			0.570	8.33			-0.028	-0.06
R^2		0.72		0.27		0.77		0.09		0.77		0.15		0.76		0.12	
Observations		9,172		9,172		2,280		2,280		2,280		2,280		1,897		1,897	

Table 6 (cont'd)

Panel B: Relation between absolute value of cumulative abnormal returns and excess audit fees

	Pred. sign	*ABS_CAR*		*ABVOL*	
		Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept		2.881	13.47	0.359	4.25
EX_FEES	+	0.355	5.53	0.144	5.88
MVE	–	-0.046	-1.24	0.035	2.47
LEV	?	-0.336	-1.39	-0.243	-2.85
MB	+	0.072	1.72	0.071	4.22
ANALYST	–	0.269	3.63	0.171	6.18
RETSTD	?	-0.456	-0.74	0.310	1.17
LIT	?	-0.024	-0.30	0.033	1.00
Adj. R^2		0.04		0.16	
Observations		2,013		2,013	

Panel C: Relation between cumulative abnormal returns, forecast surprise and excess audit fees

	Pred. sign	Mean forecast	
		Coeff.	*t*-stat.
Intercept		-1.013	-3.45
SURP	+	0.141	6.56
*SURP*EX_FEES*	+	0.087	2.31
EX_FEES	?	0.078	0.74
MVE	–	0.153	3.45
LEV	?	-0.567	-1.74
MB	+	0.104	1.68
ANALYST	–	-0.299	-3.40
RETSTD	?	-1.037	-1.25
LIT	?	0.140	1.30
Adj. R^2		0.07	
Observations		1,731	

Table 7: Alternate regression specifications

Panel A: OLS regression with two-way clustering by firm and year

	Pred Sign	*FREQUENCY*				*SPECIFICITY*				*HORIZON*				*ACCURACY*			
		LN_FEES		*FREQUENCY*		*LN_FEES*		*SPECIFICITY*		*LN_FEES*		*HORIZON*		*LN_FEES*		*ACCURACY*	
		Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept		9.290	65.13	-1.053	-4.51	8.511	30.82	2.258	7.36	8.382	30.88	2.987	9.28	8.846	26.26	1.803	0.62
FREQUENCY	+	0.081	6.11														
SPECIFICITY	+					0.120	3.26										
HORIZON	+									0.111	6.21						
ACCURACY	+													0.005	2.43		
LN_ASSETS	+	0.505	40.55			0.560	26.67			0.556	27.55			0.561	23.88		
ROA	–	-0.066	-3.96			-0.051	-0.35			-0.056	-0.36			0.086	0.43		
ACCR	+	0.011	0.91			-0.152	-0.91			-0.138	-0.79			-0.067	-0.39		
CURRENT	+	0.165	1.48			0.350	3.21			0.355	3.32			0.328	2.78		
FOREIGN	+	0.598	10.44			0.624	12.92			0.629	12.88			0.631	11.69		
SEG	+	0.009	0.77			-0.001	-0.09			-0.001	-0.12			0.000	-0.02		
LIAB	+	0.025	3.46			0.076	0.55			0.057	0.40			0.090	0.71		
LOSS	+	0.209	4.83			0.025	0.38			0.024	0.36			0.015	0.18		
DEC	+	0.018	0.30			0.084	0.87			0.078	0.81			0.102	1.01		
LAG	+	0.005	4.34			0.011	7.65			0.010	7.34			0.012	7.51		
LN_FEES	+			0.084	4.17			0.041	1.80			0.128	6.51			0.175	1.17
FREQUENCY	+															0.193	2.43
SPECIFICITY	+															0.440	0.98
HORIZON	+															-2.021	-14.32
EARNVOL	–			0.001	2.12			-0.078	-3.60			-0.090	-4.60			0.359	5.20
RETVOL	–			-0.003	-2.78			0.001	0.54			-0.002	-0.39			0.004	0.31
ANALYST	+			0.573	13.86			0.012	0.57			-0.038	-2.04			-0.050	-0.25
ISSUE	+			0.098	7.35			0.079	2.17			0.176	3.64			0.251	1.38
R^2		0.73		0.19		0.65		0.02		0.65		0.04		0.64		0.06	
Observations		44,883		44,883		8,869		8,869		8,869		8,869		7,342		7,342	

Table 7 (cont'd)
Panel B: OLS regression with firm fixed effects

	Pred Sign	*FREQUENCY*				*SPECIFICITY*				*HORIZON*				*ACCURACY*			
		LN_FEES		*FREQUENCY*		*LN_FEES*		*SPECIFICITY*		*LN_FEES*		*HORIZON*		*LN_FEES*		*ACCURACY*	
		Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept		9.282	35.10	-0.678	-5.38	4.841	7.77	1.717	7.40	4.693	7.86	3.998	12.89	4.424	6.10	-0.634	-0.24
FREQUENCY	+	0.044	2.11														
SPECIFICITY	+					0.095	3.06										
HORIZON	+									0.081	5.14						
ACCURACY	+													0.007	2.61		
LN_ASSETS	+	0.581	20.22			1.093	13.66			1.096	13.75			1.190	12.41		
ROA	–	-0.060	-4.06			-0.146	-0.83			-0.144	-0.80			-0.076	-0.41		
ACCR	+	-0.014	-1.30			-0.390	-2.26			-0.380	-2.20			-0.371	-1.98		
CURRENT	+	0.103	1.72			0.916	5.53			0.908	5.46			0.930	4.44		
FOREIGN	+	-0.039	-0.39			0.007	0.05			-0.003	-0.02			0.065	0.53		
SEG	+	-0.061	-4.00			-0.041	-2.88			-0.041	-2.84			-0.037	-2.68		
LIAB	+	0.048	8.14			0.480	3.98			0.491	4.03			0.398	3.24		
LOSS	+	-0.030	-0.87			-0.002	-0.03			-0.012	-0.16			0.010	0.17		
DEC	+	0.217	5.32			0.280	2.10			0.307	2.22			0.211	0.81		
LAG	+	0.006	5.30			0.010	6.78			0.010	6.77			0.010	6.00		
LN_FEES	+			0.057	5.56			0.051	2.94			0.019	0.81			0.300	1.59
FREQUENCY	+															0.215	3.75
SPECIFICITY	+															-0.015	-0.05
HORIZON	+															-2.022	-11.78
EARNVOL	–			-0.001	-2.96			-0.054	-1.27			0.016	0.44			0.307	3.07
RETVOL	–			-0.002	-2.17			0.006	2.36			0.004	1.66			-0.037	-1.79
ANALYST	+			0.219	15.58			0.074	3.20			0.047	1.68			-0.303	-0.95
ISSUE	+			0.005	0.44			0.023	1.28			0.009	0.42			0.486	2.46
R^2		0.88		0.51		0.83		0.38		0.83		0.64		0.83		0.30	
Observations		44,883		8,869		8,869		8,869		8,869		8,869		7,342		7,342	

Table 7 (cont'd)
Panel C: 2SLS regression with firm-level clustering

	Pred Sign	*FREQUENCY*				*SPECIFICITY*				*HORIZON*				*ACCURACY*			
		LN_FEES		*FREQUENCY*		*LN_FEES*		*SPECIFICITY*		*LN_FEES*		*HORIZON*		*LN_FEES*		*ACCURACY*	
		Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept		9.016	244.78	-1.661	-6.93	3.647	18.40	2.676	11.68	5.623	34.13	2.919	6.93	8.953	89.38	2.090	1.06
FREQUENCY	+	0.403	31.26														
SPECIFICITY	+					1.812	27.33										
HORIZON	+									0.755	21.69						
ACCURACY	+													0.050	8.12		
LN_ASSETS	+	0.473	123.07			0.530	60.26			0.518	57.69			0.561	55.28		
ROA	–	-0.054	-6.82			-0.179	-1.97			-0.136	-1.53			0.108	0.99		
ACCR	+	-0.001	-0.11			-0.250	-2.14			-0.098	-0.84			-0.057	-0.39		
CURRENT	+	0.242	9.77			0.424	6.87			0.418	6.74			0.310	4.58		
FOREIGN	+	0.517	29.46			0.673	22.57			0.676	22.50			0.622	18.76		
SEG	+	0.002	1.59			0.006	2.54			0.000	0.10			0.002	0.88		
LIAB	+	0.023	5.40			0.128	2.18			-0.029	-0.48			0.141	2.09		
LOSS	+	0.301	23.45			0.439	14.51			0.189	6.78			0.009	0.28		
DEC	+	0.136	9.24			0.185	7.12			0.087	3.33			0.108	3.70		
LAG	+	0.007	27.18			0.009	13.93			0.008	11.58			0.012	14.16		
LN_FEES	+			0.100	7.56			-0.015	-1.25			0.101	6.51			0.109	0.92
FREQUENCY	+															0.080	1.45
SPECIFICITY	+															0.218	0.74
HORIZON	+															-2.035	-16.73
EARNVOL	–			0.002	4.35			-0.060	-2.53			-0.065	-1.91			0.384	3.24
RETVOL	–			-0.003	-2.75			0.001	0.84			-0.004	-1.22			-0.018	-0.74
ANALYST	+			0.552	29.38			0.042	2.99			-0.030	-1.67			0.081	0.47
ISSUE	+			0.110	7.55			0.057	3.29			0.117	4.98			0.244	1.30
R^2		0.74		0.25		0.70		0.08		0.68		0.19		0.64		0.10	
Observations		44,883		44,883		8,869		8,869		8,869		8,869		7,342		7,342	

Table 8: Relation between voluntary disclosures and audit fees controlling for sample-selection

The table presents estimates from the following two-step Heckman self-selection model. In the first step, the following Probit regression is estimated.

$$\Pr(FORECASTERS_{i,t}=1)=G(\alpha_0+\alpha_1 EARNVOL_{i,t-1}+\alpha_2 RETVOL_{i,t-1}+\alpha_3 MVE_{i,t-1}+\alpha_4 ANALYST_{i,t-1}+\sum Industry+\sum Year+\varepsilon_{i,t})$$

where, *FORECASTERS* is an indicator variable that takes the value of 1 for firms making a forecast during the year and 0 otherwise. *EARNVOL* represents earnings volatility and is defined as the standard deviation of five annual earnings before extraordinary items scaled by total assets. *RETVOL* indicates stock return volatility and is computed as the standard deviation of five annual stock returns. *MVE* is log of market value of equity defined as stock price times shares outstanding. *ANALYST* represents the log of (1 + number of analysts following the firm) and includes firms with no analyst following. Industry indicators are defined at the 2-digit SIC level.

In the second stage, the following OLS regression is estimated

$$LN\_FEES_{i,t}=\beta_0+\beta_1 DISCLOSE_{i,t}+\beta_2 LN\_ASSETS_{i,t}+\beta_3 ROA_{i,t}+\beta_4 ACCR_{i,t}+\beta_5 CURRENT_{i,t}+\beta_6 FOREIGN_{i,t}+\beta_7 SEG_{i,t}+\beta_8 LIAB_{i,t}+\beta_9 LOSS_{i,t}+\beta_{10} DEC_{i,t}+\beta_{11} LAG_{i,t}+\beta_{12} MILLS_{i,t}+\varepsilon_{i,t}$$

where, *MILLS* is the Inverse-Mills ratio computed from the first-stage Probit regression and the other variables are as defined in Table 3. Panel A presents the first-stage Probit regression estimates, while Panel B presents the second-stage OLS regression estimates with the *t*-statistics computed based on robust standard errors clustered by firm and by year.

Panel A: First stage Probit regression

	Pred. sign	*Pr(FORECASTERS=1)*	
		Coeff.	*z*-stat.
Intercept		-1.695	-9.63
EARNVOL	–	-0.193	-11.40
RETVOL	–	-0.014	-4.92
ANALYST	+	0.691	79.19
ISSUE	+	0.136	7.35
Year effects		Yes	
Industry effects		Yes	
Pseudo. R^2		0.27	
Observations		44,883	

Table 8 (cont'd)

Panel B: Second stage OLS regression

	Pred. sign	*SPECIFICITY*		*HORIZON*		*ACCURACY*	
		Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept		8.441	22.36	8.326	22.31	9.985	23.54
SPECIFICITY	+	0.121	3.29				
HORIZON	+			0.111	6.07		
ACCURACY	+					0.004	1.81
LN_ASSETS	+	0.565	21.71	0.560	21.87	0.487	19.34
ROA	–	-0.030	-0.25	-0.039	-0.31	-0.289	-2.30
ACCR	+	-0.126	-0.84	-0.117	-0.77	-0.455	-3.27
CURRENT	+	0.352	3.14	0.357	3.25	0.292	2.87
FOREIGN	+	0.626	13.40	0.631	13.33	0.598	13.10
SEG	+	-0.001	-0.09	-0.001	-0.11	0.000	0.03
LIAB	+	0.058	0.48	0.043	0.34	0.360	3.72
LOSS	+	0.025	0.39	0.024	0.37	0.019	0.32
DEC	+	0.079	0.81	0.074	0.76	0.171	1.93
LAG	+	0.011	8.63	0.010	8.29	0.012	7.52
MILLS	?	0.043	0.57	0.035	0.46	-0.660	-7.00
Adj. R^2		0.65		0.65		0.67	
Observations		8,869		8,869		7,342	

Table 9: Relation between voluntary disclosures and choice of Big-Five auditor

The table presents the results from the following Probit regression:

$$\Pr(BIG\_FIVE = 1) = G(\alpha_0 + \alpha_1 FREQUENCY + \alpha_2 LN\_ASSETS + \alpha_3 ROA + \alpha_4 LEV + \alpha_5 ASSET\_TURN + \alpha_6 MB + \alpha_7 CAPEX + \varepsilon)$$

where, *BIG_FIVE* denotes the presence of a Big Five auditor, *FREQUENCY* indicates the number of forecasts. *LN_ASSETS* represents the log of total assets in $millions. *ROA* is net income divided by total assets. *LEV* indicates the leverage ratio. *ASSET_TURN* indicates the asset-turnover ratio. *MB* is the market-to-book ratio and *CAPEX* denotes capital expenditures. Detailed variable definitions are in Table 1.

	Pred. sign	2-way clustering	
		Coeff.	*t*-stat.
Intercept		-1.417	-6.79
FREQUENCY	+	0.108	6.70
LN_ASSETS	+	0.369	31.19
ROA	?	-0.084	-3.34
LEV	?	-0.232	-5.29
ASSET_TURN	+	0.126	3.46
MB	+	0.000	-0.11
CAPEX	+	1.023	3.65
Pseudo R^2		0.30	
Observations		44,783	

Table 10: Post Sarbanes Oxley Act market reaction to management forecasts

The table presents estimates from the following regressions:

$$ABS\_CAR_{i,t} = \delta_0 + \delta_1 POST_{i,t} + \delta_2 MVE_{i,t} + \delta_3 LEV_{i,t} + \delta_4 MB_{i,t} + \delta_5 ANALYST_{i,t} + \delta_6 RETSTD_{i,t} + \delta_7 LIT_{i,t} + e_{i,t}$$

$$ABVOL_{i,t} = \mu_0 + \mu_1 POST_{i,t} + \mu_2 MVE_{i,t} + \mu_3 LEV_{i,t} + \mu_4 MB_{i,t} + \mu_5 ANALYST_{i,t} + \mu_6 RETSTD_{i,t} + \mu_7 LIT_{i,t} + y_{i,t}$$

$$CAR_{i,t} = \theta_0 + \theta_1 SURP_{i,t} + \theta_2 SURP_{i,t} * POST_{i,t} + \theta_3 POST_{i,t} + \theta_4 MVE_{i,t} + \theta_5 LEV_{i,t} + \theta_6 MB_{i,t} + \theta_7 ANALYST_{i,t} + \theta_8 RETSTD_{i,t} + \theta_9 LIT_{i,t} + e_{i,t}$$

POST takes the value 1 for forecasts made during the years 2004 to 2007 and 0 for years prior to 2001. All other variables are as defined in Table 4. Forecasts made in the years 2002 and 2003 are excluded from both the pre and the post periods. All *t*-statistics are based on robust standard errors clustered by firm and by year.

Panel A: Regression of absolute *CAR* and abnormal volume

	Pred. sign	*ABS_CAR*		*ABVOL*	
		Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept		1.671	4.10	-0.084	-0.51
POST	+	1.450	8.14	0.618	8.51
MVE	–	-0.067	-2.91	0.020	1.57
LEV	+	-0.386	-2.62	-0.233	-3.38
MB	+	0.066	2.72	0.050	4.94
ANALYST	–	0.202	2.47	0.162	4.91
RETSTD	?	3.366	2.36	1.527	2.53
LIT	?	-0.051	-0.70	0.046	1.33
Adj. R^2		0.02		0.05	
Observations		18,654		18,654	

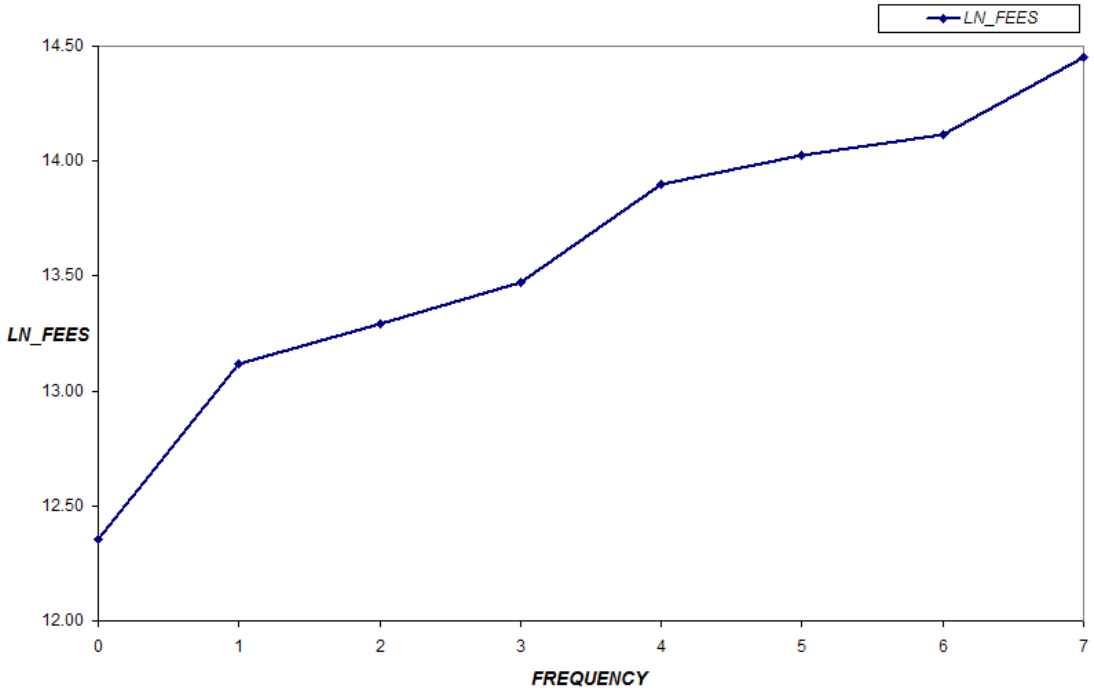
Panel B: Regression of signed *CAR* on forecast news and excess audit fees

	Pred. sign	Mean forecast	
		Coeff.	*t*-stat.
Intercept		-1.226	-3.76
SURP	+	0.070	7.95
*SURP*POST*	+	0.054	1.72
POST	?	0.086	0.74
MVE	–	0.179	9.78
LEV	+	-0.652	-3.53
MB	+	0.185	2.56
ANALYST	–	-0.283	-9.41
RETSTD	?	-1.179	-0.77
LIT	?	0.030	0.17
Adj. R^2		0.01	
Observations		16,449	

Figure 1: Relation between voluntary disclosure frequency and audit fees

Panels A, B, C and D plot the average of *LN_FEES* across firm-years grouped based on *FREQUENCY, SPECIFICITY, HORIZON* and *ACCURACY* respectively. The sample firm-years are first grouped based on the possible values for the discrete variables, *FREQUENCY* and *SPECIFICITY*, and into deciles for the continuous variables, *HORIZON* and *ACCURACY*. The below figures plot the mean *LN_FEES* for each of the groups.

Panel A: *FREQUENCY* and *LN_FEES*



Panel B: *SPECIFICITY* and *LN_FEES*

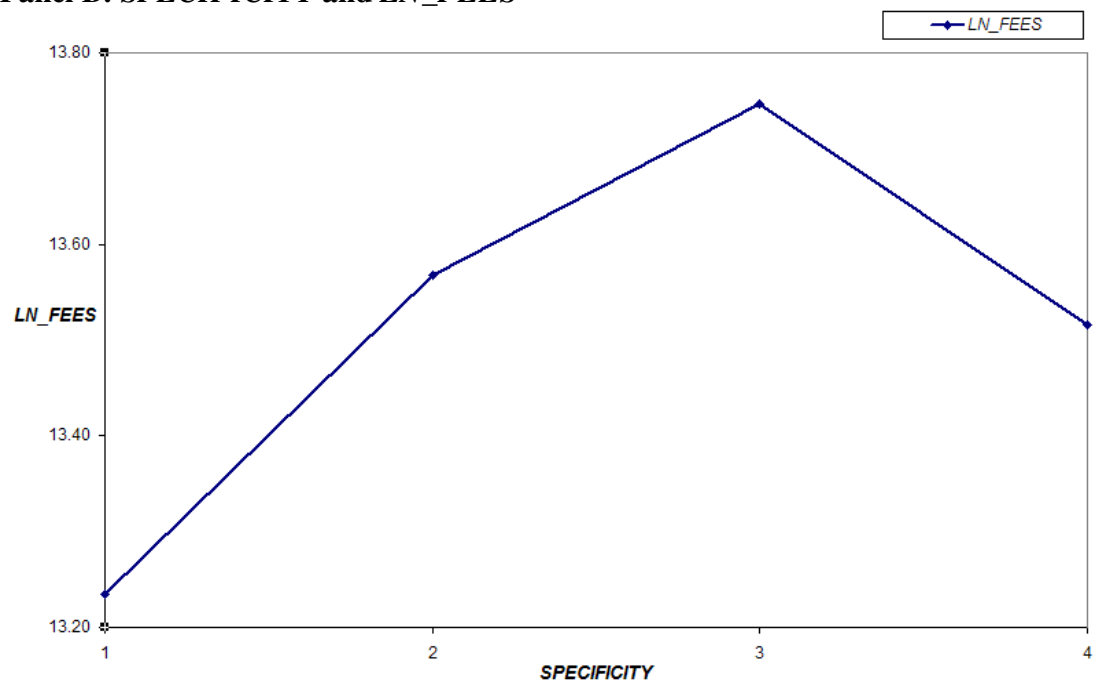
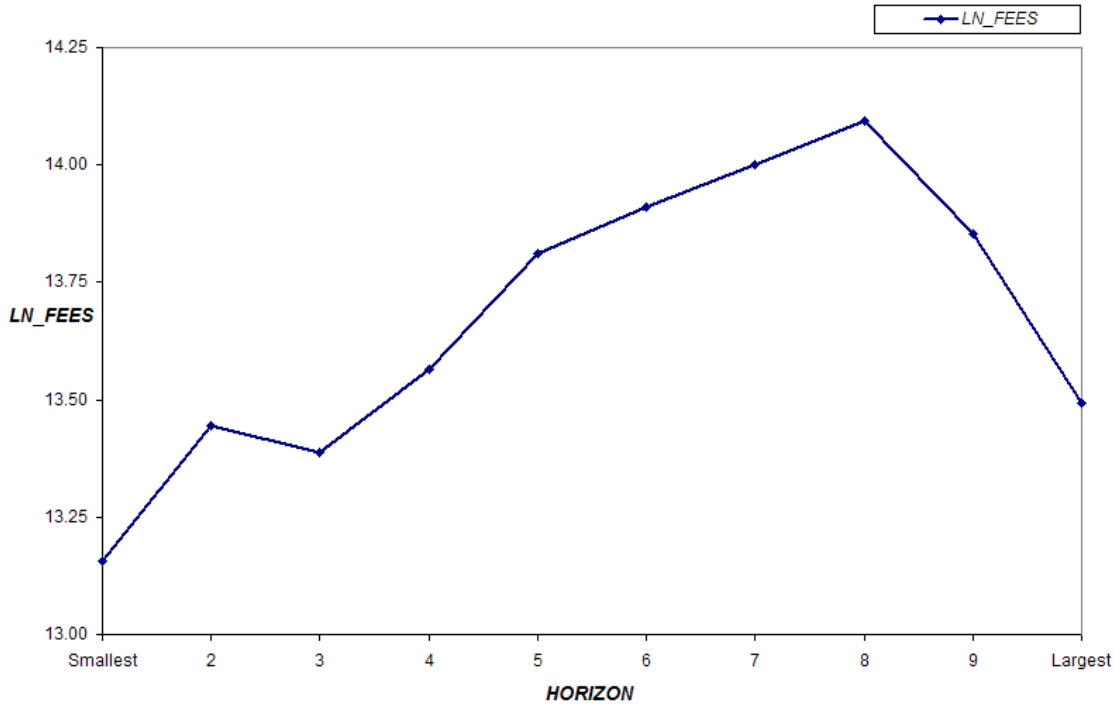


Figure 1 (cont'd)

Panel C: *HORIZON* and *LN_FEES*



Panel D: *ACCURACY* and *LN_FEES*

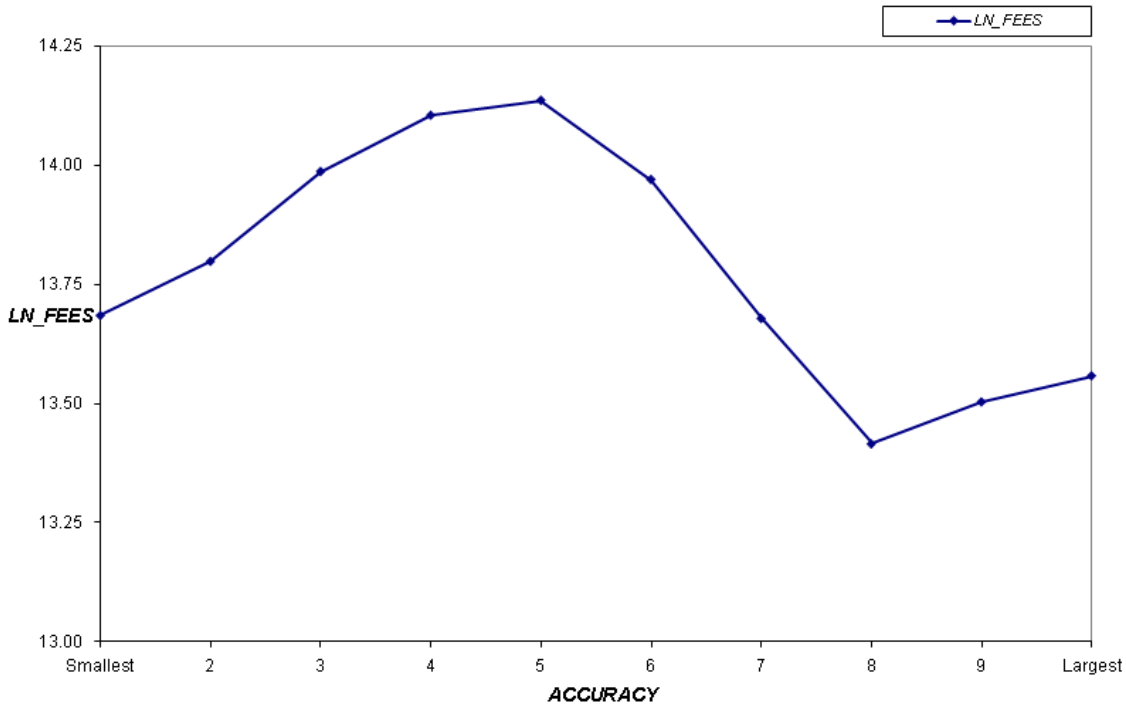
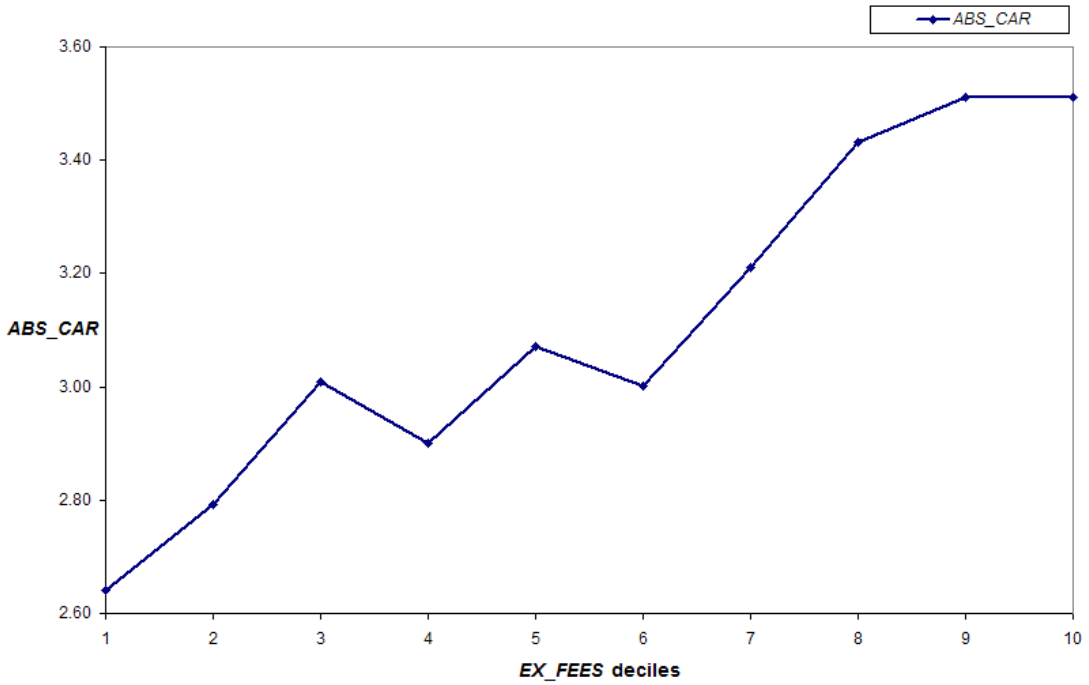


Figure 2: Relation between market reaction to disclosures and excess audit fees

ABS_CAR and *ABVOL* measure absolute cumulative abnormal returns and abnormal trading volume in the 3-day window surrounding the management forecast date respectively. Excess audit fees (*EX_FEES*) is defined as the residual of the regression of audit fees on firm-level determinants excluding forecast proxies. The x-axes plot deciles of *EX_FEES* while the y-axes plot the mean values of *ABS_CAR* (panel A) and *ABVOL* (panel B) for each decile.

Panel A: Absolute cumulative abnormal returns (*ABS_CAR*)



Panel B: Abnormal trading volume (*ABVOL*)