

Corporate Governance, Auditing and Reporting Distortions¹

RAM N.V. RAMANAN, *University of California Davis*

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Abstract

Conventional wisdom suggests that hiring independent boards limit earnings manipulations and promote accurate reporting. In contrast, this study indicates that hiring some insiders to the board facilitates the integrity of the reporting process. The central result is that strengthening board independence curtails earnings overstatements, but heightens the likelihood of understatements. This is because, reinforcing board independence limits the CEO's ability to over-report, but also encourages the auditor to economize on effort. The reduced effort impairs the auditor's ability to verify high earnings and, because auditors tend to favor conservative reports when in doubt, leads to increased incidence of conservative under-reporting.

1 Introduction

Conventional wisdom holds that good corporate governance practices, such as electing independent boards, upholds the integrity of financial reporting by reining in financial distortions. Recent academic evidence, however, appears to contradict this belief, with several studies bringing to light the apparent ineffectiveness of corporate governance in promoting financial reporting accuracy.¹ Some studies even indicate that good corporate governance may actually lead to, rather than inhibit, reporting distortions (e.g., see Larcker et. al. 2004).

By examining the auditor's response to a firm's corporate governance choices, this study demonstrates that the auditor's incentives play an important role in this apparent puzzle. Prior studies indicate that the auditor, like the manager, holds reporting preferences - in particular, a preference for conservatism - which play a part in shaping a firm's financial statements (e.g., see DeFond and Subrahmanyam 1998, p.36). I show in this study that these preferences interact with a firm's corporate governance choices in a way that confounds the earnings reporting process and leads to unexpected consequences.

I use a simple stylized model of a firm with an investment opportunity that may be implemented at a future time period. Current earnings provide information about future cash flows, so the firm's CEO attempts to manipulate earnings to alter investors' perceptions of the viability of the investment opportunity. Anticipating this behavior, board composition is determined keeping in mind shareholders' best interests. Adding independent directors to the board improves oversight and inhibits the CEO's ability to manipulate the firm's earnings. Based on the board's oversight, an auditor subsequently selects the audit technology that evaluates the potentially manipulated earnings. The interplay between these forces determine the firm's earnings report, which then influences market prices and future investment decisions. In the context of these strategic interactions, the role of board monitoring in the reporting process is analyzed.

The model's central prediction is that strengthening board independence reduces the likelihood of earnings overstatements, but at the expense of increasing the incidence of understatements. This asymmetric effect of board independence occurs when a conservative auditor examines the report issued by a CEO attempting to inflate earnings. Strengthening board independence limits the

¹Studies that show strong corporate governance fails to control reporting distortions include Vafeas (2000), Felo et al. (2003), Xie et al. (2003), Bedard et al. (2004), and Larcker et. al. (2004).

CEO's ability to overreport, but also encourages the auditor to rely more on the board's oversight and to consequently economize on audit effort. The reduced effort compromises the auditor's ability to verify high earnings. Litigation risk ensures that when the auditor fails to corroborate high earnings he exercises caution, introducing more conservative understatements into the reporting process.

This asymmetric effect of board monitoring extends even to a firm whose auditor renders non-audit services. The allure of non-audit fees tempers the auditor's incentive to report conservatively, but the disciplining effect of litigation cost ensures that he does not forsake conservatism altogether. These opposing forces motivate him to expand audit effort, which results in less conservative, yet more informative earnings than if he did not render non-audit services. But the substitution effect between board oversight and audit effort persists, so the asymmetric effect of board oversight on earnings under and over statements is preserved.

The model's second prediction is that a fully independent board may not provide the most effective form of monitoring and that having some insiders in the board may be desirable. With a fully independent board, the auditor relies too heavily on the board's oversight and shirks his monitoring responsibilities. Given its impact on reporting, shareholders may benefit from the auditor applying more of his expertise. Electing some insiders in the board keeps the auditor from shirking too much and this makes financial statements more useful and informative.

The final prediction relates to the relationship between firm performance and reporting distortions. The model indicates that firms that expect to perform well are more likely to overstate earnings than firms that expect to perform poorly, who are more likely to understate. This prediction conforms with the findings of Dechow et al. (1995) and Kasznik (1999), among others, that positive abnormal accruals arise for highly profitable firms but negative abnormal accruals occur for less profitable ones. Board composition and audit effort choices vary systematically with firm performance, and such differences contribute directly to this prediction.

Many studies examine the empirical relation between board independence and the earnings reporting process (e.g., Bedard et al. 2004, Klein 2002, Larcker et al. 2004, Vafeas 2000, Xie et al. 2003). However, results vary from study to study, limiting our understanding of that relation. Further, theory offers no guidance for empirical tests on the issue. This study fills that gap by modeling the interplay between different monitoring mechanisms to provide two new

testable predictions: (1) better board monitoring reduces earnings overstatements at the expense of increased understatements; and (2) that hiring the auditor to provide non-audit services enhances the board’s monitoring effectiveness by delivering more informative, although less conservative, earnings than when the auditor is hired for audit services alone.

This study builds on the theoretical literature on corporate governance. A few studies have analyzed the effect of board composition on specific agency problems: Hermalin and Weisbach (1998) and Laux (2008) study the role of board composition on CEO compensation and turnover; Raheja (2005) and Harris and Raviv (2008) consider its influence on investment choices; Drymiotes (2007) and Kumar and Sivaramakrishnan (2008) examine the impact of its monitoring role on efficient contracting. This paper contributes to this literature by studying the board’s monitoring role in the reporting process.

This study also contributes to the literature on strategic interactions in auditing (e.g., Fellingham and Newman 1985). It builds on the auditing models of Thoman (1996) and Shibano (2000), both of which examine the reporting issues arising from the incentives of a conservative auditor. My study extends this line of inquiry by considering how the auditor’s strategic preferences interact with and influence a firm’s corporate governance choices.

The remainder of the paper is organized as follows. Section 2 introduces the economic setting by describing the model and defining its equilibrium. Section 3 analyzes the interplay between different monitoring mechanisms and draws implications for the reporting process. Section 4 evaluates the model’s robustness to a setting where the auditor renders non-audit services. Section 5 concludes.

2 Economic Setting

2.1 Model

This section models the sequence of events depicted by the timeline in figure 1. The timeline features an information problem in which a retiring manager (henceforth referred to as the “CEO”) issues a report in period one that guides the firm’s investment decision in period two. As the investment decision occurs beyond the CEO’s horizon, she may issue a possibly manipulated report. This model focuses on studying how monitoring mechanisms can be employed to manage the

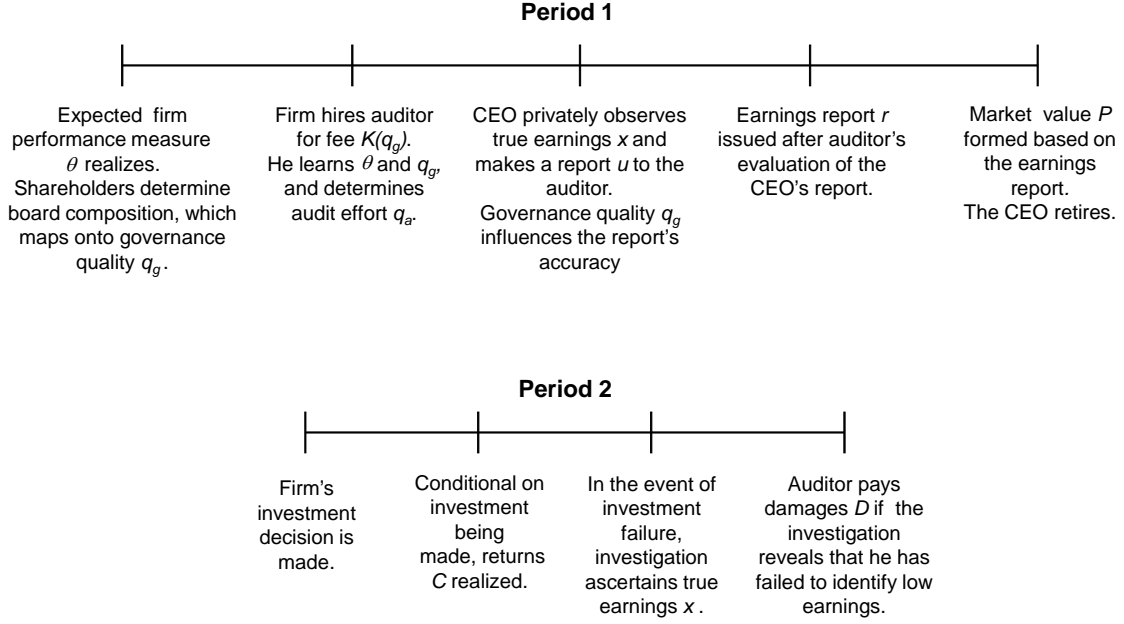


Figure 1: **Timeline**

accuracy of reported information.

Consider a firm, which in period one of the model owns an investment opportunity that allows for a fixed investment I in period two. If implemented, this investment opportunity may either be successful, generating cash flows $C_h > I$, or unsuccessful, generating cash flows $C_\ell < I$. For simplicity, and without loss of generality, I normalize the cash flow C_ℓ to 0.

Firm performance is correlated over time, so the firm's first-period earnings provides information about the viability of second-period investment I . Assume that the binary variable $\tilde{x} \in \{x_h, x_\ell\}$ represents the publicly unobservable "true" first-period earnings with $x_h > x_\ell$. The *ex ante* probability of high earnings x_h is common knowledge and is given by $\theta \in [\underline{\theta}, \bar{\theta}]$ where $0 < \underline{\theta} < \bar{\theta} < 1$. The variable θ can be viewed as a measure of the firm's expected performance.

First-period earnings provide information about returns from second-period investment in the following way: $\Pr[C_h|\tilde{x} = x_h] = p_H$ and $\Pr[C_h|\tilde{x} = x_\ell] = p_L$, where $1 > p_H > \frac{1}{2} > p_L > 0$. If decision makers in the second period observe true first-period earnings, they invest only when earnings are high, i.e., I assume:

$$p_H C_h - I > 0 > p_L C_h - I. \quad (1)$$

In the absence of any information about first-period earnings, all projects are undertaken, i.e.,

$$[\theta p_H + (1 - \theta) p_L] C_h - I > 0. \quad (2)$$

Relative to the investment decision made with knowledge of true earnings this creates an inefficiency, since it results in a greater likelihood of investments in unsuccessful projects.

The retiring CEO privately observes true earnings \tilde{x} . Although shareholders prefer that she report honestly, her own incentives are to influence the firm's stock price by manipulating the earnings report (for reasons exogenous to the model, her remuneration increases with the firm's stock price and earnings). This creates a conflict with the interests of shareholders. The legal requirement that an auditor certify the firm's financial statement provides some credibility to the earnings report. However, the auditor does not observe true earnings \tilde{x} . Rather, in the course of his audit, he observes an earnings report $\tilde{u} \in \{x_h, x_\ell\}$ made by the CEO. I refer to \tilde{u} as the firm's unaudited earnings, which has the same support as true earnings.

The firm's board of directors facilitates the reliability of the CEO's report. For instance, the board ensures that the firm's internal controls function effectively without being overridden by the CEO who may seek to misreport earnings. Further, any changes in accounting policies or practices aimed at manipulating earnings usually require board approval. Consequently, the extent of board-oversight plays an important role in the CEO's ability to manipulate earnings.

It is usually argued that insiders in the board represent the CEO's interests and act as his facilitators rather than as his monitors and that outside directors on the board, who are independent of the CEO's influence, alone provide oversight. This argument suggests that a board comprised entirely of insiders allows the CEO to freely report his choice of earnings u and a board comprised entirely of outsiders provides effective monitoring and limits the CEO's earnings manipulations. When the board comprises of both insiders and outsiders, the dynamic of the board's functioning is less obvious, and how directors' individual preferences map onto the board's monitoring propensity remains unclear. But it seems reasonable to assume that as the proportion of outsiders in the board increases, the likelihood of the board representing the CEO's interest decreases.

I model these features of board oversight on earnings manipulation as follows. At the beginning of the first period, immediately after the realization of expected performance measure θ , the extent

of insiders in the board is determined with the shareholders' best interests in mind. The board-composition maps into the publicly observable governance quality $q_g \in [\underline{q}_g, \overline{q}_g]$. Intuitively, $\frac{q_g - \underline{q}_g}{\overline{q}_g - \underline{q}_g}$ represents the fraction of outsiders in the board, and higher outsider representation signifies superior monitoring. The CEO, after observing true earnings \tilde{x} , decides his earnings manipulation strategy $m(x)$ where $m(x = x_j) \in \{1, 0\}$. Here, $m(x_j) = 1$ ($m(x_j) = 0$) represents his strategy to attempt (not to attempt) to manipulate earnings when $\tilde{x} = x_j$, and misrepresent it as $u = x_k$, $j \neq k$ with $j, k \in \{h, \ell\}$. For simplicity, I assume that earnings manipulation is costless. The board's impact on earnings manipulation is then characterized by:

$$\Pr[u = x | m(x) = 1] = f(q_g); \text{ and } \Pr[u = x | m(x) = 0] = 1,$$

where $f(\underline{q}_g) = 0$, $f(\overline{q}_g) < 1$, $\frac{df(q_g)}{dq_g} > 0$, and $\frac{d^2f(q_g)}{dq_g^2} < 0$. That is, given that the CEO tries to manipulate earnings, $f(q_g)$ represents the probability with which the board succeeds in preventing her from misreporting to the auditor. Improvements to corporate governance q_g reduce the CEO's ability to successfully misreport to the auditor, but at a decreasing rate. Further, the formulation implies that though a board may be independent and remain vigilant, the CEO's capacity to manipulate earnings without raising any internal control red-flags means that earnings manipulations may not be completely eliminated, i.e., $f(\overline{q}_g) < 1$. When the CEO chooses not to manipulate earnings, unaudited earnings u reflect true earnings x .

Before the unaudited earnings are realized, but after the board's selection, the firm hires an auditor from a competitive audit market for the non-contingent fee $K(q_g)$. Immediately after appointment, based on the publicly observable expected performance measure θ and governance quality q_g , the auditor commits to audit resources that determine the level of audit effort q_a , with \underline{q}_a denoting the minimum level of effort permitted in any audit assignment. Audit effort comes at a personal cost q_a to the auditor. Once he exerts effort $q_a \geq \underline{q}_a$ examining the books of the firm, he forms an assessment e of the firm's earnings. The accuracy of such assessment increases in audit effort q_a , with:

$$\Pr[e = x | q_a] = \phi(q_a),$$

where $\phi(\cdot)$ is a probability function with $\phi(q_a) \in [\frac{1}{2}, 1]$ that satisfies $\frac{d\phi(q_a)}{dq_a} > 0$ and $\frac{d^2\phi(q_a)}{dq_a^2} < 0$.^{2,3}

Based on his own assessment e and the CEO's report u , the auditor determines the final report $r = r(e, u)$. The auditor can either attest the CEO's report, so that $r = u$, or require an audit-adjustment to the firm's earnings. The auditor can only seek an adjustment if such adjustment is backed by his audit evidence. In other words, with an audit adjustment the earnings report has to satisfy $r = e$.

When the CEO attempts to manipulate earnings, the effectiveness of each of the two monitoring technologies in preventing earnings misstatements increases in the level of the other, but the marginal effectiveness of each technology reduces in the level of the other. For tractability, I parameterize the technologies as: $f(q_g) = 1 - \frac{1}{q_g}$ with $\underline{q_g} = 1$ and $\phi(q_a) = 1 - \frac{1}{q_a}$ with $\underline{q_a} = 2$.

Once the earnings report r emerges as an outcome of this monitoring process, the market for the firm's shares open. Taking into consideration the publicly observable governance quality q_g and expected performance θ , the market rationally prices the firm based on the earnings report r . The CEO then retires and consumes her payoff, which increases with the firm's stock price. Her reporting decisions, naturally, focus on influencing stock price, rather than on maximizing shareholder value.

The CEO's successor observes the earnings report and decides whether to fund the investment opportunity. For a given earnings report r , I let $i(r) = 1$ ($i(r) = 0$) denote the decision to fund (not to fund) the investment. If the successor chooses to fund the investment opportunity and it turns out to be unsuccessful, an investigation determines if an audit failure has occurred. The investigation reveals true earnings x , and an audit failure is said to have occurred if true earnings of the firm were low ($x = x_\ell$) but reported earnings were high ($r = x_h$). When an audit failure does occur, the auditor is liable and pays expected damages of D to the firm's shareholders. If the investment opportunity is successful, the firm receives cash flow C_h , which is then distributed to the shareholders. The firm liquidates at the end of the second period.

²The assumption that $\phi(q_a) \geq \frac{1}{2}$ ensures that the auditor is never more likely to be wrong about his assessment than he is right.

³Though the above characterization assumes symmetry in the auditor's ability to identify high and low earning, it is not critical to the model. All results in the paper remain qualitatively the same when adopting differential auditor abilities in identifying high and low earnings. The symmetry purely simplifies the model by limiting the number of variables used.

2.2 Equilibrium Definition

This sub-section presents the shareholders' problem and defines the game's Bayes-Nash equilibrium.

For any given governance quality q_g and reported earnings r , the CEO's successor rationally anticipates the exiting CEO's and the auditor's equilibrium behaviors and evaluates the project's expected net present value (NPV), denoted by $V(r, q_g)$. Expression (3) establishes the expected NPV, conditional on both high and low earnings reports being made.⁴

$$\begin{aligned} V(r = x_h, q_g) &= \Pr[x = x_h | r = x_h] p_H C_h + \Pr[x = x_\ell | r = x_h] (p_L C_h + (1 - p_L) D) - I, \\ V(r = x_\ell, q_g) &= \Pr[x = x_h | r = x_\ell] p_H C_h + \Pr[x = x_\ell | r = x_\ell] p_L C_h - I. \end{aligned} \quad (3)$$

The CEO's successor invests in the project if and only if its expected NPV is positive. The market anticipates this and prices the firm equal to the expected future cash flows described by:

$$P(r, q_g) = V(r, q_g) \cdot \hat{i}(r). \quad (4)$$

I denote a conjectured strategy with a $\hat{\cdot}$ above the strategy, whereas a strategy without $\hat{\cdot}$ denotes the realized strategy. Thus, for example $\hat{i}(r)$ represents the market's conjecture of the investment strategy in the second period. This conjecture is rational in the sense that for each report r , the market correctly anticipates the second period investment strategy, which is the solution to:

$$\max_{i(r)} V(r, q_g) \cdot i(r) \quad \text{subject to: } i(r) \in \{1, 0\}. \quad (5)$$

Shareholder interests are maximized by treating the investment strategy in (5) as given and determining the governance quality that maximize the firm's expected future cash flows:

$$\max_{q_g} V(r = x_h, q_g) \Pr[r = x_h | q_g] \hat{i}(x_h) + V(r = x_\ell, q_g) \Pr[r = x_\ell | q_g] \hat{i}(x_\ell) - K(q_g) \quad (6)$$

$$\text{Subject to: } q_g \in [\underline{q}_g, \overline{q}_g], \quad (7)$$

$$K(q_g) \geq D \cdot (1 - p_L) \cdot \hat{i}(r = x_h) \cdot \Pr[x = x_\ell, r = x_h | u] - \hat{q}_a, \quad (8)$$

⁴To prevent notational clutter, probability functions are, to the extent possible, presented by ignoring all arguments other than earnings variables. For example, $\Pr[x|r, q_g, q_a, m(x_h), m(x_\ell)]$ is presented as $\Pr[x|r]$.

$$q_a \in \arg \min_{q_a^*} D \cdot (1 - p_L) \cdot \hat{i}(r = x_h) \cdot \Pr[x = x_\ell, r = x_h | q_a^*] + q_a^*, \quad (9)$$

$$q_a(u) \geq \underline{q}_a, \quad (10)$$

$$m(x_j) \in \arg \max_{m^*(x_j)} P(x_h, q_g) \cdot \Pr[r = x_h | x, m^*(x_j)] + P(x_\ell, q_g) \cdot \Pr[r = x_\ell | x, m^*(x_j)], \quad (11)$$

$$r \in \arg \min_{r^* \in \{u, e\}} D \cdot (1 - p_L) \cdot \hat{i}(r^* = x_h) \cdot \Pr[x = x_\ell, r^* = x_h | q_a, u, e] \quad (12)$$

The above optimization program presents the objective function in (6), which represents the corporate governance choice that maximizes shareholders' collective wealth. This governance choice satisfies feasibility condition (7). Condition (8) reflects the auditor's participation constraint that audit fee should exceed the sum of his audit costs and expected damages. Constraint (9) requires that the auditor's effort choice minimize his total expected costs, including cost of conducting the audit and the expected damage pay out. This choice exceeds minimum audit effort permitted in (10). Requirement (11) represents the CEO's earnings manipulation strategy that maximizes the expected market price of the firm at the end of period one. Condition (12) represents the auditor's reporting strategy that minimizes his litigation cost.

To ensure an interior solution to the maximization problem, I make the following assumptions.

A1. Assume that damages D are sufficiently large so that the auditor always exerts non-trivial effort, i.e., it turns out that

$$D \geq \frac{4\bar{q}_g}{(1 - p_L)(1 - \bar{\theta})}.$$

A2. Assume θ , the likelihood of high earnings, is not very close to 1.⁵

With this background, an equilibrium can be defined as follows:

Definition 1 *An equilibrium consists of governance quality q_g , audit fee $K(q_g)$, earnings manipulation strategy $m(x)$, audit effort q_a , auditor's reporting strategy $r(u, e)$, market pricing function $P(r, q_g)$, and investing decision $i(r)$, where:*

(a) *Treating audit fee $K(q_g)$, earnings manipulation strategy $m(x)$, audit strategies $q_a \in \mathcal{E}$ $r(e, u)$, and investment decision $i(r)$ as given, governance quality q_g solves (6) subject to (7);*

(b) *Given governance quality q_g , and treating audit strategies $q_a \in \mathcal{E}$ $r(e, u)$, earnings manipulation strategy $m(x)$ and investment decision $i(r)$ as given, audit fee $K(q_g)$ satisfies (8) with*

⁵If the probability of high earning x_h is close to 1, purpose of the earnings report is diminished, and the analysis becomes less meaningful. To view the actual upper-bound of θ , see the proof of proposition 2.

equality;

(c) Given governance quality q_g , and treating earnings manipulation strategy $m(x)$, reporting strategy $r(e, u)$, and investment decision $i(r)$ as given, audit effort q_a solves (9), subject to (10);

(d) Given true earnings x and governance quality q_g , and treating pricing function $P(r, q_g)$ and audit strategies q_a & $r(e, u)$ as given, earnings manipulation strategy $m(x)$ solves (11);

(e) Given the auditor's effort q_a , unaudited earnings u , and audit evidence e , the auditor's reporting strategy $r(u, e)$ satisfies (12);

(f) Given earnings r and governance quality q_g , and treating strategies q_a , $r(e, u)$, and $m(x)$ and investment decision $i(r)$ as given, market price $P(r, q_g)$ satisfies (4);

(g) Given earnings r and governance quality q_g , and treating strategies q_a , $r(e, u)$, and $m(x)$ as given, investment decision $i(r)$ solves (5).

Part (a) requires that the governance quality is determined to maximize shareholders' collective payoff after rationally anticipating the CEO's earnings manipulation strategy and the audit technology. Part (b) captures the presence of a competitive audit market, which ensures that the auditor gets paid his reservation fee to accept the audit assignment. Part (c) indicates that for a given governance quality, the auditor correctly anticipates the CEO's earnings manipulation strategy and the firm's future investment strategy, and then selects the audit effort that minimizes his total expected costs. Part (d) provides the CEO's earnings manipulation strategy that maximizes expected market price of the firm at the end of period one. Part (e) indicates that the auditor evaluates the CEO's report in light of his audit evidence to determine the firm's earnings report that minimizes his expected litigation cost. Part (f) states that the market correctly anticipates both the audit technology and the CEO's earnings manipulation strategy, and prices the firm in a rational manner, assuming that the optimal investment decision will be made. Part (g) declares that the firm only invests in the second period if the expected net payoff from investment is positive.

3 Effect of corporate governance on the accounting system

This section studies the effect of corporate governance on a firm's information environment and evaluates the corporate governance quality that maximizes firm value. Characterizing the optimal corporate governance choice requires an understanding of managerial reporting incentives and of

the audit strategy. To this end, lemma 1 below presents the CEO's reporting behavior and the auditor's audit strategy.

Lemma 1 *For a given corporate governance quality q_g :*

(a) *The CEO's optimal earnings manipulation strategy is :*

$$m(x = x_h) = 0; \text{ and}$$

$$m(x = x_\ell) = 1.$$

(b) *The audit technology is characterized by:*

$$\begin{aligned} \text{Audit effort:} \quad q_a &= \sqrt{\frac{D(1-\theta)(1-p_L)}{q_g}}; \text{ and} \\ \text{Reporting strategy:} \quad r &= \min\{u, e\}. \end{aligned}$$

Lemma 1 predicts that the CEO's manipulation strategy aims to maximize earnings, where she attempts to over-report earnings when true earnings are low but reports truthfully when true earnings are high. The market rewards high reported earnings with a better price than it does low reported earnings. To benefit from a higher market price, the CEO attempts to manipulate earnings upward whenever possible.

The auditor anticipates such manipulation and determines his effort intensity q_a by considering the monitoring quality within the firm. When he perceives board oversight to be inadequate, he steps up the intensity of auditing effort.⁶ This behavior by the auditor follows from the prescription of the Statement of Auditing Standard 55, which requires the auditor to evaluate internal monitoring mechanisms and assess audit-related risks prior to designing audit tests.

The auditor can anticipate the CEO's incentives, so he counteracts her propensity to inflate earnings by adopting a conservative reporting strategy, where he requires greater verification for recognizing a favorable report than an unfavorable report, which he accepts more easily.⁷ That is, when the CEO reports $u = x_h$, the auditor accepts it only when verified by audit evidence $e = x_h$.

⁶The substitution effect implied by this result receives empirical support from Jensen and Payne (2003), among others. Other analytical studies that find similar substitution effect among monitoring technologies include Pae and Yoo (2001) and Patterson and Smith (2007).

⁷Conservatism is usually described as the tendency to require a higher degree of verification for recognizing positive news in earnings than for recognizing negative news (Basu 1997).

Whereas, when she reports $u = x_\ell$, the auditor accepts it readily. This conservative reporting strategy is characterized mathematically by $r = \min \{u, e\}$. Such conservatism in the face of managerial incentives to inflate earnings is well documented in the literature. For example, Kinney and Nelson (1996) show, in the context of contingent liabilities, that auditors issue conservative reports “expecting the worst” even when actual outcomes subsequently turn out to be more favorable for the firm. Hackenbrack and Nelson (1996) establish similar conservative reporting by the auditor in the context of provisions for doubtful debts. More generally, DeFond and Subrahmanyam (1998) and Francis and Krishnan (1999) provide evidence that auditors require firms to report total accruals conservatively when faced with managerial incentives to manipulate earnings.⁸

Having established the strategic behaviors of the auditor and the CEO, the rest of the section explores the relationship between corporate governance and various facets of the firm’s information environment.

3.1 Role of corporate governance and audit conservatism on reported earnings

The interactions between board monitoring and the strategies of the CEO and the auditor shape the firm’s earnings reporting process. In the presence of such interactions, the relationship between the strength of board monitoring (i.e., corporate governance) and earnings accuracy is not obvious. Though one would expect stronger corporate governance to lead to less distortions in reported earnings, such expectations lack empirical foundation. For instance, Xie et. al. (2003) and Bedard et al. (2004) fail to find evidence of stronger board monitoring leading to reduced distortions in reported earnings. More surprisingly, Larcker et al. (2004) indicate that improved board oversight may in fact lead to, rather than inhibit, reporting distortions. The following proposition offers one explanation for these surprising findings.

Proposition 1 *Strengthening corporate governance reduces earnings overstatements but increases understatements, i.e., $\frac{d\Pr[r=x_h|x=x_\ell]}{dq_g} < 0$ and $\frac{d\Pr[r=x_\ell|x=x_h]}{dq_g} > 0$.*

Proposition 1 predicts an asymmetric effect of board monitoring on earnings over and understatements. Board monitoring limits the CEO’s ability to manipulate earnings both upwards and

⁸SAS No. 82 emphasizes auditors’ need to consider management motivations while undertaking audit assignments, and incentives to misreport (especially incentives to inflate earnings) can foster such audit conservatism.

downwards. This leads to the expectation that strong board oversight will limit both over and understatement of earnings. However, since the CEO only attempts to manipulate earnings upwards, but not downwards, improved board oversight limits overstatement but has no direct bearing on understatement. But strengthening board oversight also foretells a decrease in audit effort. The lower audit effort reduces the auditor's ability to verify high earnings, and thus precipitates his need to report conservatively. Such conservatism increases the possibility of earnings being underreported (see figure 2).

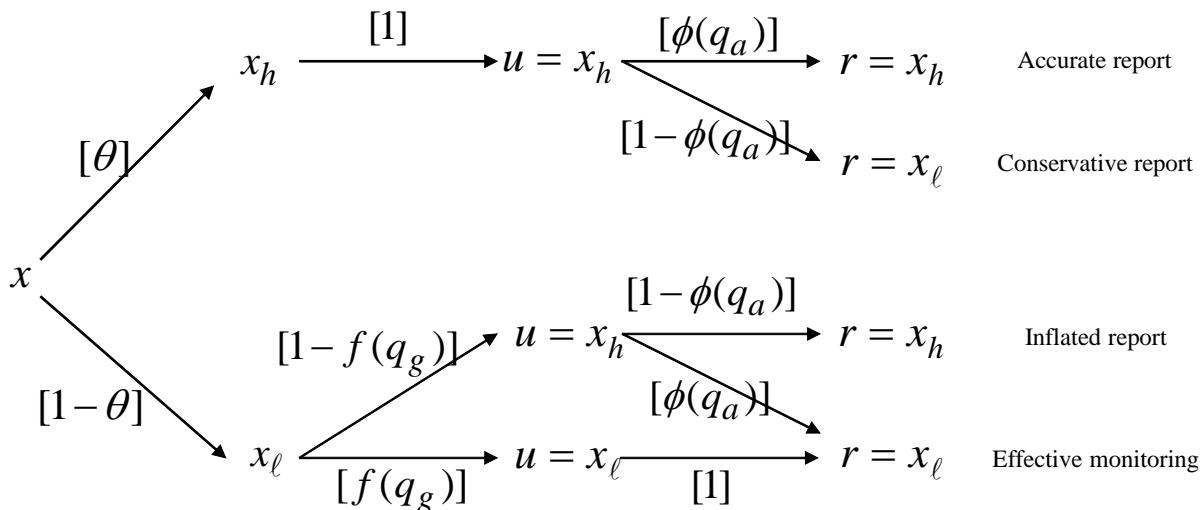


Figure 2: **The equilibrium reporting process with probability values in square brackets.**

This prediction of asymmetry, to the best of my knowledge, has not been directly tested. Although, recent empirical studies by Ahmed and Duellman (2007) and Garcia Lara et al. (2009) indicate that good corporate governance leads to more conservatism on published financial statements. The prediction from proposition 1 complements and extends these studies by identifying disparate effects of corporate governance on the reporting process.

3.2 Equilibrium corporate governance choice and investment strategy

The firm's earnings report provides information about future investment returns. To maximize shareholder value, such information should help economize on investments that eventually fail and maximize on investments that ultimately succeed. The optimal corporate governance quality, denoted by $q_g(\theta)$, that leads to such information production is presented in proposition 2 below,

along with the investment choices that it induces.

Proposition 2 *In equilibrium,*

(a) *the corporate governance quality chosen is:*

$$q_g(\theta) = \frac{(1 - \theta)(I - p_L C_h + (1 - p_L) D)}{(\theta p_H C_h - I\theta)}; \text{ and}$$

(b) *the investment decisions in the second period are given by:*

$$i(r = x_h) = 1; \text{ and } i(r = x_\ell) = 0.$$

Proposition 2 predicts that the optimal governance quality is below the maximum $\overline{q_g}$, even though good governance entails no direct costs. In other words, packing the board with outsiders does not provide the most effective form of monitoring. Having insiders in the board helps.

To understand this result, observe that unlike the auditor, shareholders do not view corporate governance and audit effort as perfect substitutes. Recall from proposition 1 that strengthening board independence increases the chances of understating earnings due to auditor conservatism. Conservative understatements incur costs because it causes potentially successful projects to be discarded in the second period (for evidence that conservatism leads to underinvestment in positive NPV projects, see Lee 2010; see also Roychowdhury 2010). Such understatements can be curtailed, but only at the expense of overstating earnings - by relaxing board independence to stimulate higher audit effort. Overstating earnings also incurs costs because it induces investments in unsuccessful projects. As a result, shareholders' corporate governance choice trades-off their costs of earnings under and overstatements.

Patterson (1993) argues that audit effort (Patterson uses "sample size" to capture audit effort in her model) itself acts a mechanism that trades-off over and understatements. But whenever the auditor does not fully internalize shareholders' cost of understating earnings, the auditor's effort choice leads to more understatements than shareholders finds desirable. Shareholders thus take it upon themselves to limit understatements by their corporate governance choice. The model introduces the incentive misalignment between shareholders and the auditor by the simplifying assumption that the auditor's cost of understating is zero. Even if this were not the case, as long as

the auditor's cost of conservatively understating earnings remains lower than that of shareholders', the economics underlying this result remain valid.

This result is also related to Drymiotis (2007). In Drymiotis (2007), the presence of insiders in the board is optimal because their presence makes outside directors vigilant, so they do not neglect their monitoring responsibilities. In my study, the presence of insiders in the board mitigates free riding by the auditor, and this improves overall reliability of the reporting process.

This prediction (that maximizing governance monitoring remains sub-optimal) suggests that providing the CEO greater flexibility to manipulate earnings (by relaxing governance quality) can enhance firm value. In line with this prediction, Bowen et al. (2004) show that accounting flexibility directly attributable to limited corporate governance can create firm value. This result is in contrast to those of most studies that model earnings management as undesirable, though unavoidable *ex post* (examples of such studies include Dye 1988, Evans and Sridhar 1996, Demski 1998 and Demski et al. 2004). These models suggest that when managers possess the ability to manipulate earnings, any contract that attempts to minimize earnings manipulation imposes significant costs because such a contract would adversely affect other productive actions. Hence earnings management is tolerated. However, these studies do not explain why managers are afforded such flexibility with regard to earnings management in the first place. This study offers one explanation: that allowing managers greater flexibility to manipulate earnings can alleviate the agency conflict between the firm and its auditor. Since the firm's shareholders have no direct influence on audit effort, they use their corporate governance choice to indirectly exert some influence on the auditor's choices.

3.3 Firm performance and corporate governance

Proposition 2 establishes the optimal governance quality as an interior solution, implying a non-monotonic relationship between governance quality and firm value. Then, it is not surprising that empirical studies that investigate the effects of corporate governance on firm performance fail to find a clear relationship between the two (see Baysinger and Butler 1985, Hermalin and Weisbach 1991, Ferris et al. 2003, among others). Studies investigating the direction of causation in the relationship between firm performance and governance quality confirm the lack of a systematic effect of good governance on firm performance, but find that firm performance may have a bearing on corporate governance choices (e.g., Agrawal and Knoeber 1996, and Bhagat and Black 2002).

The next proposition explores how firm performance metric θ influences the corporate governance choice and also predicts its relationship with earnings misstatements.

Proposition 3 *As expected performance measure θ increases,*

(a) equilibrium corporate governance quality $q_g(\theta)$ decreases; and

(b) low earnings $x = x_\ell$ are more likely to be overstated as $r = x_h$ in equilibrium and high earnings $x = x_h$ are less likely to be understated as $r = x_\ell$ in equilibrium, i.e., $\Pr[r = x_h | x = x_\ell, \theta]$ increases with θ , and $\Pr[r = x_\ell | x = x_h, \theta]$ decreases with θ .

Part (a) of proposition 3 predicts: the better a firm expects to perform, the weaker its corporate governance. This negative relationship conforms with the findings of both Agrawal and Knoeber (1996) and Bhagat and Black (2002). As discussed earlier, the corporate governance choice trades-off the cost of a conservatively understated report with that of an inflated report. A given level of conservative understatement of high true-earnings, i.e., $\Pr[r = x_\ell | x = x_h]$, leads to a greater frequency of profitable projects being discarded for a firm with better expected performance θ than for a firm with lower θ . Thus, the cost of conservative understatements also increases with the performance measure θ . As a result, better the firm (i.e., higher the θ), greater the need to limit the likelihood of conservative understatements by relaxing governance quality. An undesirable repercussion of relaxing corporate governance, however, is the increase in incidence of earnings overstatements. This explains the predictions in part (b) of the proposition.

The results in part (b) provide an explanation for the well known findings of Dechow et al. (1995) and Kasznik (1999), among others. These studies show that well performing firms have positive abnormal accruals while poorly performing ones have negative abnormal accruals. Proposition 3 suggests that this result is, at least in part, driven by differences in monitoring mechanisms that vary systematically with expected firm performance.

4 Non-audit services

The study thus far has conducted the analysis in the context of an auditor whose only concern relates to litigation risk. But the auditor is also motivated by other benefits he derives from working for the client. Prior to SOX, auditors routinely rendered non-audit services to their clients. Many argue

that offering these services alters auditors' reporting preferences (e.g., see Sutton 1997, Kornish and Levine 2004). This section analyses the extent to which providing non-audit services modifies the reporting process described earlier.

As in Kornish and Levine (2004), assume that before she leaves office the CEO offers to hire the auditor for a non-audit service contract worth $c > 0$ if he is willing to attest her high report $u = x_h$. Say, the offer is for rendering non-audit services while implementing the investment opportunity. For simplicity, let the auditor incur no additional costs related to the non-audit service. To restrict focus to the issue at hand, I abstract away from the notion of economies of scope (e.g., Antle and Demski 1991; and Kornish and Levine 2004) between the audit and non-audit services. That is, both the investment's payoff and the initial outlay are insensitive to whether the firm hires the auditor for this service or prefers someone else. Retain all other features of the main model described in section 2, including the assumption that litigation cost D is sufficiently high to dissuade reckless auditor behavior.

I now evaluate how auditor behavior changes due to the possibility of receiving non-audit fees.

Proposition 4 *For a given strength of corporate governance q_g :*

- (a) *the auditor is more likely to issue a high earnings report $r = x_h$ when he receives an offer for non-audit services than when he does not;*
- (b) *the auditor exerts greater audit effort when he receives an offer for non-audit services than when he does not; and*
- (c) *both the audit effort and the likelihood of issuing a high earnings report $r = x_h$ increase with non-audit fee c offered.*

Allowing the auditor to provide non-audit services tempers his incentive to report conservatively. Even so, litigation cost D deters reckless overreporting, so the auditor continues to adopt the conservative reporting strategy $r(e, u) = \min\{e, u\}$. However, he modulates the degree of conservatism by increasing audit effort. Audit effort improves the likelihood of verifying high earnings and so reduces the necessity for conservative audit adjustments. Thus, the auditor exerts greater effort when enticed by non-audit fees (and disciplined by litigation risk) to produce a less conservative, but more informative report.

The result in part (a) concurs with Kornish and Levine (2004), who also find that providing

non-audit services renders financial statements less conservative. However, in Kornish and Levine (2004), the reduced conservatism turns financial statements less informative, whereas part (b) of proposition 4 indicates that financial statements become more informative. The main distinction between the two studies is this. In my setting, non-audit fees mitigate moral hazard by propelling the auditor to exert greater effort. Kornish and Levine (2004) address a different research question for which they abstract away from the issue of moral hazard. In a setting such as theirs, where the auditor always exerts enough effort to learn true earnings, reduced conservatism equates to increased overstatement.

The result in part (c) is a natural extension of the results in parts (a) and (b). The non-audit fee counteracts the auditor's incentive to report conservatively, so increasing it motivates him to exert greater effort, which leads to higher frequency of earnings report $r = x_h$.

It is important to note that disciplined by litigation risk, the auditor continues to adhere to reporting conservatism, i.e., he reports $r(e, u) = \min\{e, u\}$, even when enticed by non-audit fees.⁹ This ensures that the main insights from proposition 1 continue to be valid even when the auditor provides non-audit services. That is:

Proposition 5 *Even when the auditor derives non-audit fees, strengthening the firm's corporate governance reduces earnings overstatements at the expense of increased understatements.*

The model's main prediction regarding how corporate governance affects the reporting process is preserved even when the auditor renders non-audit services. The marginal benefit of effort to the auditor always diminishes with the strength of the firm's corporate governance. Then, the substitution effect – of the auditor limiting his effort in response to good corporate governance – continues to hold. This produces the same asymmetry in the reporting process as derived in proposition 1.

Although good corporate governance continues to have an asymmetric effect on under and over statements, the effect of good governance in inducing understatements is much lower when the auditor renders non-audit services. As a result, the information environment admits more efficient investment decisions when the auditor renders non-audit services than when he does not.

⁹Empirical evidence in the literature supports this argument that auditors do not forsake conservatism even when they receive non-audit fees from their clients (e.g., DeFond et al. 2002, and Ruddock et al. 2006).

Proposition 6 *Firm value improves when the auditor can be employed to render non-audit services.*

Proposition 6 indicates that allowing the auditor to render non-audit services is socially efficient, even in the absence of economies of scope. The possibility of losing non-audit fee by reporting low earnings imposes a cost on the auditor from being conservative. With both over and understatements now rendered costly, he exerts greater effort to provide an informative report. Thus, non-audit service fee provides a second lever (in addition to corporate governance choice) to motivate the desired auditor effort.

This discussion relates to the ongoing debate on whether auditors should be permitted to render non-audit services. Others have argued in favor of restricting auditors from providing those services, on the premise that it compromises the integrity of the audit. This has led to Title II of the Sarbanes Oxley Act (“Auditor independence”), which now prohibits auditors from rendering most non-audit services to their audit-clients. My model indicates that to the extent litigation costs remain sufficiently high, allowing an auditor to render non-audit services leads to a decline in audit conservatism, but does not compromise the integrity of the audit. Rather, my model predicts that it improves audit quality.

5 Conclusion

This study analyzes how corporate governance choices influence the earnings reporting process. The analysis indicates that good corporate governance curtails earnings overstatements, but leads to understatements due to auditor conservatism. This asymmetry persists even when the auditor renders non-audit services. Finally, this paper offers potential explanations for some empirical anomalies in corporate governance, as well as makes new testable predictions.

6 Appendix

6.1 Proof of Lemma 1

In order to prove Lemma 1, first establish the following result

Lemma A: For any given q_a and q_g , when $m(x = x_h) = 0$ & $m(x = x_\ell) = 1$ and $r(e, u) = \min\{e, u\}$, the following hold:

$$\begin{aligned}
\Pr[x = x_h, r = x_h] &= \theta \left(1 - \frac{1}{q_a}\right); & \Pr[x = x_\ell, r = x_\ell] &= (1 - \theta) \left(1 - \frac{1}{q_a q_g}\right); \\
\Pr[x = x_\ell, r = x_h] &= (1 - \theta) \frac{1}{q_a q_g}; & \Pr[x = x_h, r = x_\ell] &= \theta \frac{1}{q_a}; \\
\Pr[r = x_h | x = x_h] &= \left(1 - \frac{1}{q_a}\right); & \Pr[r = x_h | x = x_\ell] &= \frac{1}{q_a q_g}; \\
\Pr[r = x_\ell | x = x_h] &= \frac{1}{q_a}; & \text{and} & \Pr[r = x_\ell | x = x_\ell] = \left(1 - \frac{1}{q_a q_g}\right);
\end{aligned} \tag{13}$$

Proof of Lemma A: When $m(x)$ and $r(e, u)$ follow what is stated in the lemma, the earnings reporting process is given by figure 2. Then (13) follows from substituting the appropriate values of $f(q_g)$ and $\phi(q_a)$ in the probability functions. ■

To establish the optimal earnings management strategy and the audit technology, consider the subgame following governance quality choice q_g .

Claim: The equilibrium in the sub-game is given by:

$$P(r = x_h, q_g) = \frac{\left(1 - \frac{1}{q_a}\right) \theta p_H C_h + \frac{1-\theta}{q_a q_g} (p_L C_h + (1 - p_L) D)}{\left(1 - \frac{1}{q_a}\right) \theta + \frac{1-\theta}{q_a q_g}} - I, \tag{14}$$

$$P(r = x_\ell, q_g) = \text{Max} \left\{ 0, \frac{\left(\frac{1}{q_a}\right) \theta p_H C_h + \left(1 - \frac{1}{q_a q_g}\right) (1 - \theta) p_L C_h}{\left(1 - \frac{1}{q_a q_g}\right) (1 - \theta) + \frac{1}{q_a}} - I \right\}, \tag{15}$$

$$q_a = \sqrt{\frac{D(1 - \theta)(1 - p_L)}{q_g}}, \tag{16}$$

$$r(e, u) = \min\{e, u\} \tag{17}$$

$$K(q_g) = 2q_a, \tag{18}$$

$$m(x = x_h) = 0, \text{ and } m(x = x_\ell) = 1 \tag{19}$$

Proof of claim:

A Bayes-Nash equilibrium to the subgame following the governance quality choice is considered. Solving the subgame is akin to solving constraints (8) to (12) taking (4) and (5) as given.

1. Audit technology $(q_a, r(e, u))$

1a. Audit effort q_a :

The auditor observes the governance quality q_g , and taking other equilibrium strategies as given, he solves for (9) subject to the constraint in (10). Solving (9) as an unconstrained optimization after substituting probability values from (13) yields:

$$q_a = \sqrt{\frac{D(1-\theta)(1-p_L)}{q_g}}.$$

The constraint in (10) that $q_a \geq \underline{q}_a = 2$ always holds because of assumption (A1). This establishes the audit effort in (16).

1b. Reporting strategy $r(e, u)$:

The auditor's liability is for overstating earnings. No overstatement is possible when reported earnings are low. Hence he will attest whenever unaudited earnings are low, i.e., $r(e, u = x_\ell) = x_\ell$. When unaudited earnings are high, it is optimal to use his evidence to minimize overstatements, i.e., $r(e, u = x_h) = e$. Combining together, $r(e, u) = \min\{e, u\}$, establishing (17).

2. Audit fees $K(q_g)$: Constraint (8) is binding in equilibrium. Substituting from (13) and solving (8) as an equality yields:

$$K(q_g) = 2q_a, \text{ establishing (18).}$$

3. Earnings management strategy $m(x)$: Since in equilibrium, $P(r = x_h, q_g) > P(r = x_\ell, q_g)$ (easily established by comparing $V(r = x_h, q_g)$ and $V(r = x_\ell, q_g)$ from (3)), the CEO's payoff is greater when the firm reports high earnings $r = x_h$. Given that she correctly anticipates the auditor's conservatism, it is impossible to report $r = x_h$ unless $u = x_h$. Thus, she prefers to report high unaudited earnings $u = x_h$ whenever possible. Hence, $m(x_h) = 0$, and $m(x_\ell) = 1$. This establishes (19).

4. Market Prices: The market prices, $P(r, q_g)$ given in (4) can be written as

$$P(r, q_g) = V(r, q_g) \bullet i(r) = \text{Max}\{V(r, q_g), 0\} \quad (20)$$

4a. Computing $P(r = x_h, q_g)$: Given the market's conjecture about the earnings manipulation strategy and audit technology, the expected NPV is given by (3). Substituting relevant values from

(13) in (3) yields:

$$V(r = x_h, q_g) = \frac{\left(1 - \frac{1}{q_a}\right) \theta p_H C_h + \frac{1-\theta}{q_a q_g} (p_L C_h + (1 - p_L) D)}{\left(1 - \frac{1}{q_a}\right) \theta + \frac{1-\theta}{q_a q_g}} - I \quad (21)$$

Claim 1: $P(r = x_h, q_g) = V(r = x_h, q_g)$, *i.e.*, $V(r = x_j, q_g) > 0$ for all feasible q_a, q_g (Also implies $i(r = x_h) = 1$)

Proof of claim 1: From (2), $\theta p_H C_h + (1 - \theta) p_L C_h > I$.

Multiplying both sides by $\frac{1}{q_a q_g}$ and rewriting $I = \{\theta + (1 - \theta)\} I$,

$$\implies \frac{1}{q_a q_g} \theta p_H C_h + \frac{1}{q_a q_g} (1 - \theta) p_L C_h > \frac{1}{q_a q_g} \theta I + \frac{1}{q_a q_g} (1 - \theta) I \quad (22)$$

From (1), since $p_H C_h > I \implies [\theta p_H C_h - \theta I] > 0$ and since $q_a \geq 2, q_g \geq 1, \implies \left(1 - \frac{1}{q_a}\right) \geq \frac{1}{2} \geq \frac{1}{q_a q_g} \implies \left[\left(1 - \frac{1}{q_a}\right) - \frac{1}{q_a q_g}\right] \geq 0$.

$$\text{Thus, } \left[\left(1 - \frac{1}{q_a}\right) - \frac{1}{q_a q_g}\right] [\theta p_H C_h - \theta I] \geq 0 \quad (23)$$

Adding equations (22) and (23) and making simple manipulations yields $V(r = x_h, q_g) > 0$ for all q_a, q_g , thus proving claim 1. ■

Thus, in equilibrium $P(r = x_h, q_g)$ is given by (21), establishing (14).

4b. Computing $P(r = x_\ell, q_g)$: From (20), price $P(r = x_\ell, q_g) = \text{Max}(V(r = x_\ell, q_g), 0)$. Again, since the market's conjectures are right in equilibrium, substituting relevant values from (13) into (3) and simplifying:

$$V(r = x_\ell, q_g) = \frac{\left(\frac{1}{q_a}\right) \theta p_H C_h + \left(1 - \frac{1}{q_a q_g}\right) (1 - \theta) p_L C_h}{\left(1 - \frac{1}{q_g}\right) (1 - \theta) + \left(1 - \frac{1}{q_a}\right) \left(\frac{1}{q_g}\right) (1 - \theta) + \frac{1}{q_a} \theta} - I \quad (24)$$

Substituting in (20) above yields (15). This completes the proof.

(19) establishes part (a) of lemma 1, while (16) and (17) establish part (b). ■

6.2 Proof of proposition 1

Proof follows by computing the appropriate probability values from (13), substituting the optimal audit response to a given governance quality from (16), and differentiating them with respect to governance quality q_g . ■

6.3 Proof of proposition 2

(a) Governance choice q_g is obtained by anticipating the subgame following the governance choice and solving the maximization problem in (6) subject to (7). Given that the conjectures about the audit technology and the CEO's earnings management strategy are correct in equilibrium, substituting equilibrium probability values from (13), audit effort q_a from (16), market prices $P(r = x_h, q_g)$ and $P(r = x_\ell, q_g)$ from (14) and (15), respectively, in (6), and solving as an unconstrained optimization yields:

$$q_g(\theta) = \frac{(1-\theta)(I-p_L C_h + (1-p_L)D)}{(\theta p_H C_h - I\theta)} \quad (25)$$

Since (A2) holds by assumption the constraint (7) that $q_g \geq \underline{q}_g = 1$ is always satisfied, and \bar{q}_g can always be chosen as a sufficiently large value to ensure $q_g \leq \bar{q}_g$ is also satisfied.¹⁰ Thus, (25) provides governance quality, establishing part (a) of the proposition.

(b) Investment decision: $i(r = x_h) = 1$ follows from Claim 1 in the proof of lemma 1.

Claim : $i(r = x_\ell) = 0$ when $q_g = \frac{(1-\theta)(I-p_L C_h + (1-p_L)D)}{(\theta p_H C_h - I\theta)}$.

Proof of claim : $i(r = x_\ell) = 0 \iff V(r = x_\ell, q_g) \leq 0$

Substituting the value of q_g as well as the optimal value of q_a from (16) (since the market's conjecture about audit effort is correct in equilibrium) into (24), and making some simple manipulations, I get $\theta \leq \left(\frac{-z + \sqrt{z^2 + 4y^2}}{2y} \right)^2 \iff V(r = x_\ell, q_g) \leq 0$

where $y = \sqrt{D(1-p_L)(I-p_L C_h + (1-p_L)D)(p_H C_h - I)}$; and

$$z = \left[(p_H C_h - I) + (I - p_L C_h + (1 - p_L) D) \frac{p_H C_h - I}{I - p_L C_h} \right].$$

From assumption (A2), we know $\theta \leq \left(\frac{-z + \sqrt{z^2 + 4y^2}}{2y} \right)^2$. Thus $V(r = x_\ell, q_g) \leq 0 \iff i(r = x_\ell) =$

¹⁰Assumption (A2) states that $\bar{\theta}$ is given by $Min \left[\frac{I - p_L C_h + (1 - p_L) D}{p_H C_h - p_L C_h + (1 - p_L) D}, \left(\frac{-z + \sqrt{z^2 + 4y^2}}{2y} \right)^2 \right]$ where $y = \sqrt{D(1-p_L)(I-p_L C_h + (1-p_L)D)(p_H C_h - I)}$; and $z = \left[(I - p_L C_h + (1 - p_L) D) \frac{p_H C_h - I}{I - p_L C_h} + (p_H C_h - I) \right]$.

0. This proves part (b) of the proposition. ■

6.4 Proof of proposition 3

(a) Part (a) follows from differentiating (25) with respect to θ .

(b) By substituting the equilibrium governance quality q_g from (25) and audit effort q_a from (16) into the probability values $\Pr[r = x_h|x = x_\ell]$ and $\Pr[r = x_\ell|x = x_h]$ derived from (13), and differentiating with respect to θ yields part (b). ■

6.5 Proof of proposition 4

I first prove part (b). First, since D is sufficiently high, the auditor adopts the conservative reporting strategy $r(e, u) = \min\{e, u\}$. Next, in determining effort, the auditor minimizes his total cost:

$$q_a \in \underset{q_a^*}{\text{ArgMin}} D(1 - p_L) i(r = x_h) \bullet \Pr[x = x_\ell, r = x_h] + \Pr[r = x_\ell] c + q_a^*$$

Comparing with (9), and since $\Pr[r = x_\ell]$ decreases with q_a , it is easily seen that q_a is greater than in the regime with no non-audit fee c . This proves part (b).

The probability of reporting high earnings is given by: $\theta\phi(q_a) + (1 - \theta)[1 - f(q_g)][1 - \phi(q_a)]$. Expanding, it can be seen that for a given governance quality, this is an increasing function of q_a . Then, given the result in part (b), part (a) follows.

Part (c) trivially follows from an analysis similar to the above. ■

6.6 Proof of proposition 5

Since the auditor adopts the conservative reporting strategy (see proof of proposition 4), the proof follows from an analysis similar to the one in proposition 1. ■

6.7 Proof of proposition 6

A setting restricting the firm from hiring an auditor for non-audit services can be seen as an additional constraint $c = 0$ in the shareholders' maximization problem. Naturally, removing this constraint from the firm's optimization problem improves firm value (at least weakly).¹¹ ■

¹¹ An alternate proof is to show that selecting the same $q_g(\theta)$ chosen in proposition 2 now leads to a higher payoff to shareholders.

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