Corporate Governance, Accounting Conservatism, and Manipulation

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February 2013

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Abstract

Prior studies have portrayed accounting conservatism as a tool that enables boards to perform their monitoring duties. We develop a model that suggests that the empirical association between conservatism and governance can also run in the opposite direction – only well-governed firms with sufficient monitoring in place can fully utilize the benefits of conservative accounting. In our setting, conservatism is advantageous because it enables boards to reject unprofitable investments. This feature of conservatism, however, causes the manager to manipulate the system in an attempt to distort boards' investment decisions. Well-governed firms curtail the manager's ability to manipulate, reducing the negative side effects of conservatism. Our model predicts that stronger corporate governance is associated with greater accounting conservatism, greater manipulation, and higher firm value.

1 Introduction

Recent empirical work examines the relation between corporate governance quality and accounting conservatism, finding either a positive relation (e.g., Ramalingegowda and Yu 2012; García Lara, García Osma, and Penalva 2009) or no relation (Larcker, Richardson, and Tuna 2007). Prior work has motivated a link between governance and conservatism primarily by describing conservatism as a tool that boards can use to monitor and control managers' investment decisions (Ball 2001), or otherwise constrain earnings manipulation (Watts 2003a).

Our model provides an alternative explanation for the positive association between corporate governance and accounting conservatism. In our setting, all else equal, the board of directors, who we assume seeks to maximize shareholder value, prefers conservative accounting because it helps the board to prevent investments with a high likelihood of failure. Managers disagree with the board's investment preferences, and manipulate the accounting system in order to counteract the effects of conservative accounting on the board's investment decision. Corporate governance tempers the manager's ability to manipulate, which allows well-governed firms to use more conservative accounting. While we predict that governance facilitates the use of conservative accounting, prior work has focused on the use of conservatism as a tool for monitoring.

In our model, the board faces an investment choice that can be viewed as expanding the firm into a new market or product. The board perceives a high probability failure and will not approve expansion unless it receives information that supports the investment. We follow the FASB's (1980, ¶95) characterization of conservatism: "if two estimates of amounts to be received or paid in the future are about equally

likely, conservatism dictates using the less optimistic estimate." In particular, a signal about the profitability of expansion may be inconclusive, and we model conservatism as the extent to which inconclusive signals generate bad, rather than good, reports. *Ceteris paribus*, the board prefers conservative accounting because it maps inconclusive signals to unfavorable reports, supporting their preference not to expand when they receive no new information.

In contrast to the board, the manager wishes to pursue expansion even when the accounting system conveys no information. The manager's preference for expansion can arise from, for example, private benefits that are proportional to the gross payoff from expansion (Stein 1997; Scharfstein and Stein 2000), or optimism (e.g., Malmendier and Tate 2005, 2008).[1] Because managers prefer to expand following an inconclusive signal, and conservatism maps inconclusive signals to unfavorable reports that lead the board to reject expansion, managers have an incentive to manipulate earnings produced by a conservative accounting system. Effective governance reduces the manager's ability to manipulate, and allows the board to choose more conservative accounting without incurring excessive costs from manipulation.

In addition to examining the relation between governance and conservatism, our model provides insights into the effects of governance on accounting manipulation and investment efficiency. All else equal, stronger governance leads to less manipulation, consistent with conventional views. However, as just discussed, the fact that governance directly curbs manipulation renders it optimal to choose more conservative accounting, which encourages manipulation. This indirect effect on manipulation via conservatism dominates the direct effect, such that improvements in governance qual-

[1]Malmendier and Tate (2005) show that managerial optimism can lead to overinvestment even when the manager intends to maximize shareholder value.

ity lead to more accounting manipulation. Nevertheless, better governance leads to more accurate accounting reports and better expansion decisions. Our model therefore predicts that stronger corporate governance is associated with greater accounting conservatism, manipulation, and investment efficiency.

We also contribute to recent research on the relations between managerial optimism, accounting manipulation, and conservative accounting. Many studies provide evidence that managers and entrepreneurs exhibit optimism with respect to their investment ideas (Baker and Wurgler 2013). Motivated by these findings, Ahmed and Duellman (2013) find evidence that firms run by optimistic managers exhibit less conservative accounting, which they interpret as due to optimistic managers overvaluing net assets. Our model provides an alterative explanation for their evidence. In our setting, an optimistic manager has a stronger incentive to distort the accounting system (consistent with Schrand and Zechman 2012) to steer the board's decision in his favor. While the board cannot control the manager's manipulation incentive due to optimism, it can control the incentive that stems from conservative accounting. The board therefore reduces accounting conservatism in order to mitigate the optimistic manager's incentive to manipulate, yielding a negative relation between conservatism and manager optimism. In equilibrium, the effect of the board's lowering of conservatism dominates the effect of the manager's optimism, and greater managerial optimism leads to *less* manipulation. In addition, we predict that managerial optimism leads to lower investment efficiency.

Our model suggests that the magnitude of manipulation does not always proxy for reporting quality, in the sense of the accounting report leading to efficient investment decisions. As discussed earlier, stronger governance leads to greater investment efficiency, but also leads to more conservative accounting, which induces more manip-

ulation. Governance can therefore induce a positive relation between manipulation and reporting quality. In contrast, a more informative accounting system reduces the manager's incentives to manipulate and increases investment efficiency, leading to a negative association between manipulation and investment efficiency.

In addition to the above predictions, we predict a negative association between the value of the firm's growth opportunities and accounting conservatism. The lower the *ex ante* value of the firm's expansion opportunities, the more the board prefers to map inconclusive signals to a bad report. Because we predict that manipulation increases with conservatism, the negative association between conservatism and growth opportunities implies a negative association between manipulation and growth opportunities.

Our study adds to the literature on accounting conservatism by showing an alternative explanation for a positive association between corporate governance and accounting conservatism.[2] Whereas prior studies focus on the argument that "governance employs conservatism as a mechanism to fulfill its monitoring role" (García Lara, García Osma, and Penalva 2009), we show that the causality can run in the opposite direction. In our setting boards do not need to rely on conservatism to monitor management. A well governed firm directly curbs manager's manipulation incentives through oversight and thereby reduces the negative side effects associated with conservative accounting. In other words, well governed firms face a lower cost of using conservative accounting. We also show that the magnitude of manipulation does not necessarily reflect the quality of reporting or governance.

Prior studies have developed settings where conservatism reduces the incentives

[2]Several studies examine accounting conservatism in debt contracting context where there is no conflict between managers and shareholders, and there is no earnings manipulation (e.g., Gigler, Kanodia, Sapra, and Venugopalan 2009; Caskey and Hughes 2012; Li 2013).

for manipulation, consistent with the arguments in Watts (2003a). In Chen, Hemmer, and Zhang (2007), conservatism lowers manipulation incentives by reducing the difference in share prices after favorable and unfavorable accounting reports. In Gao (2012), conservatism reduces the incentives for manipulation by increasing the scrutiny applied to favorable reports. In contrast to these studies, Göx and Wagenhofer (2009) predict that the ability to manipuate reports leads to more conservative accounting, in the sense of stricter thresholds for impairment. Our study differs from these by showing a setting where conservative accounting leads to more manipulation, and the manager's ability to manipulate renders the optimal accounting system less conservative.

Gao and Wagenhofer (2012) also offer a novel explanation for the positive link between governance and conservatism. In their model, the board relies on an accounting report and, possibly, its own monitoring effort to make a manager replacement decision. More effective boards use more conservative accounting. In their setting, the board's payoff from exerting monitoring effort is greater after an unfavorable report that is relatively more likely to lead to a decision to replace the manager. Conservative accounting increases the frequency of unfavorable reports, and incurring monitoring costs. Only effective boards find the extra montioring worthwhile, leading to a positive association between goverance and conservative accounting. We predict a positive relation between governance and conservatism, as in Gao and Wagenhofer (2012), but for different reasons. In addition, our model sheds light on the relations between governance, conservatism, accounting manipulation, managerial optimism, and investment efficiency (firm value).

The next section develops our model. Section 3 derives the manager's reporting choice and Section 4 derives the shareholders' accounting choice, taking into account

how it impacts the manager's behavior. Section 5 analyzes how equilibrium choices vary with the model's exogenous parameters and Section 6 provides empirical predictions in terms of observable variables. Section 7 concludes. Unless otherwise stated, all proofs are in Appendix A.

2 Model

In our setting, a risk-neutral manager runs a firm owned by risk-neutral shareholders who are represented by a benevolent board. The model has times 0, 1, and 2. At Time 0, the shareholders determine the firm's accounting policies. At Time 1, the manager provides a report to the board, who decides whether to expand the firm's operations. The report can be viewed as reflecting the Time 1 results of the firm's operations. The payoff from expansion depends on the state θ of the world, which is either good or bad, $\theta \in \{\theta_B, \theta_G\}$. If the state is good (bad), the expansion will succeed (fail) with certainty. If successful, the project generates incremental cash flows of $X > 0$ and if it fails, it generates incremental cash flows of zero. To implement the expansion, shareholders have to invest $I > 0$ with $X > I$. We normalize the status quo cash flows, from not expanding the firm, to zero.

The shareholders and the manager may disagree on the *a priori* probability of the good state. The manager's and the shareholders' prior subjective beliefs about the probability of the good state are α_C and α_S, respectively, with $\alpha_S \leq \alpha_C < 1$. The players' beliefs (α_S, α_C) are common knowledge. Allowing the manager to be optimistic enables us to study the question how managerial optimism affects the optimal design of the accounting system. Managerial optimism does not play a crucial role for our results. We assume that, in the absence of additional information, the

project has a negative net present value from the shareholders' perspective, $\alpha_S X - I < 0$. In other words, absent some new information, the board believes that it will not pay to expand the firm's operations. In the context of an accounting report, this can be viewed as representing a low-growth industry where only surprising earnings would indicate profitable growth opportunities. In a capital budgeting context, this could reflect risky industries, such as pharmaceuticals, where the typical project fails and it only pays to pursue projects after receiving some preliminary news of their profitability. We maintain the context of an earnings report in order to link our results to accounting reports. The assumption of negative *ex ante* net present value (NPV) creates a natural demand for conservative accounting as we explain later in this section.[3]

Figure 1 provides a diagram of the accounting system. The firm's information system produces an unobservable signal, $S \in \{S_B, S_G\}$. With probability p, the signal is perfectly informative of the state in the sense that $S = S_i$ if $\theta = \theta_i$, for $i = B, G$. With probability $(1 - p)$, the signal is independent of the state and thus not informative. In this case, the signal is bad, $S = S_B$, with probability c and good, $S = S_G$, with probability $(1 - c)$, where the parameter c captures the level of conservatism. Thus, if the state is good, the signal is favorable with probability $p + (1 - p)(1 - c)$ and unfavorable with probability $(1 - p)c$. Conversely, if the state is bad, the signal is favorable with probability $(1 - p)(1 - c)$ and unfavorable with probability $p + (1 - p)c$. The larger the parameter p, the more informative the signal is for the expansion decision.

[3] This is similar to a prediction from Gigler, Kanodia, Sapra, and Venugopalan (2009), who analyze conservative accounting in a setting with debt contracts and an interim abandonment decision. There, conservative accounting only has value when the *ex ante* belief is that the project should be abandoned at the interim stage. Also see a similar prediction in Lu and Sapra (2009), where clients prefer conservative auditor when they have relatively poor *ex ante* payoffs from investment.

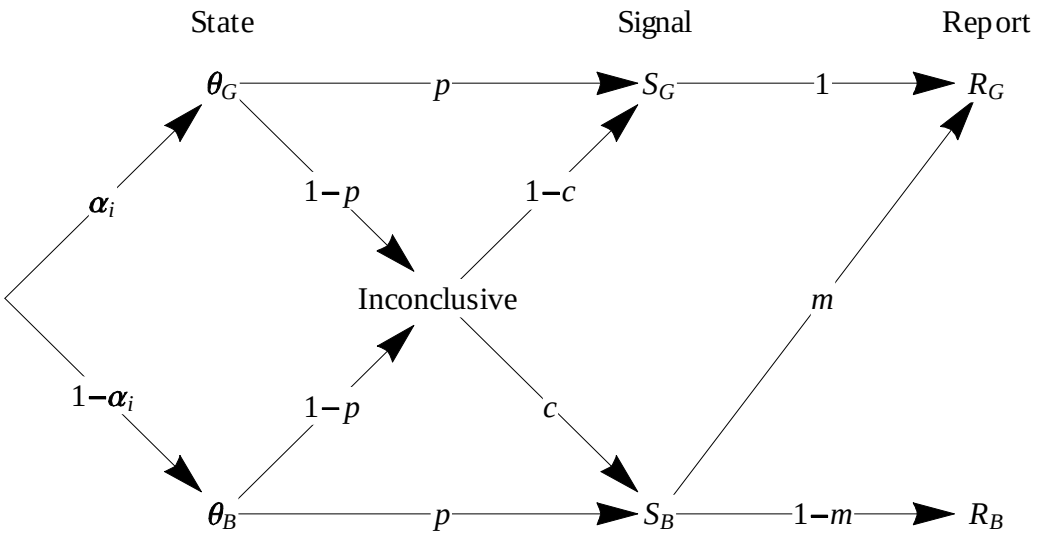

Figure 1: Signal structure. The shareholders' (manager's) prior belief of a good state is α_S (α_C). The signal is informative with probability p and the accounting system maps an inconclusive report to a bad signal with probability c. The manager successfully manipulates a bad signal with probability m.

From an *ex ante* perspective, the perceived probability of obtaining a bad signal differs for the manager and the shareholders because the manager believes that the good state occurs with probability α_C and shareholders believe it occurs with probability α_S. From the manager's perspective, the probability that the signal is unfavorable is $(1-\alpha_C)\,p+(1-p)\,c$, which is increasing in the level of conservatism.

If the signal were observable, the manager would revise the probabilities to

$$P_C(\theta_G|S_G) = \alpha_C \frac{p+(1-p)(1-c)}{\alpha_C p+(1-p)\,(1-c)} \geq \alpha_C, \tag{1}$$

$$P_C(\theta_B|S_B) = (1-\alpha_C)\,\frac{p+(1-p)\,c}{(1-\alpha_C)\,p+(1-p)\,c} \geq 1-\alpha_C. \tag{2}$$

Note that the information content of the good signal increases with c, $\frac{dP_C(\theta_G|S_G)}{dc} > 0$, and the information content of the bad signal decreases with c, $\frac{dP_C(\theta_B|S_B)}{dc} < 0$. At the maximum level of conservatism, $c = 1$, the good signal is perfectly informative

and indicates that the state is good, $P_C(\theta_G|S_G) = 1$. Conversely, at the lowest level of conservatism, $c = 0$, the bad signal is perfectly informative and indicates that the state is bad, $P_C(\theta_B|S_B) = 1$.

The same arguments hold for the board except that the board has the prior α_S instead of α_C. However, the board does not directly observe S but instead observes a report $R \in \{R_G, R_B\}$ generated by the accounting system. In the absence of manipulation, the accounting report is perfectly informative about the signal and $R_i = S_i$ for $i = G, B$.

The manager can interfere with the accounting system so that a bad signal S_B generates a good report R_G with probability $m \in [0, 1]$.[4] As we show later, the manager never wishes to increase the probability of a bad report. The resulting probability of the accounting system producing a good report given a good signal is $P(R_G|S_G) = 1$ while the probability of the accounting system producing a good report given a bad signal is $P(R_G|S_B) = m$.

The manager incurs a cost $0.5km^2$, with $k \geq 0$, for the ability to manipulate. The manager incurs the cost regardless of the signal realization.[5] One interpretation is that the manager incurs the cost of creating vulnerabilities in the accounting system that render it subject to later manipulation, as in Bar-Gill and Bebchuk (2003). For example, the manager may face sanctions for failing to maintain adequate internal controls, regardless of whether or not any manipulation took place (PCAOB 2007),

[4]The modeling of manipulation as increasing the probability of a good report resembles Gao (2012) and Drymiotes and Hemmer (2013).

[5]See Ewert and Wagenhofer (2011) and Gao (2012) for a similar assumption that the manager incurs manipulation costs *ex ante*. In Appendix B, we discuss an alternative setting where the manager only incurs the cost when actually attempting to manipulate (i.e., after observing S_B) and show that similar forces apply, although conservatism c always takes a corner solution of zero or one. The threshold that determines the choice of $c \in \{0, 1\}$ vary similarly to the comparative statics in our primary analysis.

but only exploits the vulnerabilities after observing a bad signal. Another interpretation is that the manager uses devices such as accounting-based bonuses or social pressure to encourage other employees, such as division and plant managers, to report high earnings. In this latter interpretation, the manager never actually sees the underlying signal S, but instead only observes the report after information has passed through the potentially biased accounting system.

We interpret k as an indicator of the strength of corporate governance. For example, if we interpret the earnings management costs as related to creating vulnerabilities in the accounting system, k could reflect board oversight via the internal control function. The compensation committee's oversight can render it more difficult for the manager to use bonuses to induce manipulation.[6]

After the accounting report is observed, the board (acting in the best interest of the shareholders) decides whether to expand operations, depending on whether they perceive expansion to be a positive NPV investment. Because the manager does not take any actions to increase the likelihood of a bad report, a bad report indicates that the signal is bad, $P_S(\theta_G|R_B) = P_S(\theta_G|S_B) \leq \alpha_S$. Given that $P_S(\theta_G|R_B)X - I \leq \alpha_S X - I < 0$, the board finds it optimal to reject expansion when $R = R_B$.

If the report is favorable, the board understands that it might have been distorted. Nevertheless, to ensure that the report is useful for decision making, we assume that it is optimal to implement the project in this case; that is, we assume that

$$P_S(\theta_G|R_G)X - I \geq 0, \tag{3}$$

[6]For example, section 303A.05 of the New York Stock Exchange (NYSE) Listed Company Manual includes as a minimum requirement that the compensation committee "make recommendations to the board with respect to non-CEO executive officer compensation."

and later verify the conditions under which this assumption holds. Direct computations give:

$$P_S(R_G|\theta_G) = \underbrace{p}_{\substack{\text{Accurate} \\ \text{report}}} + \underbrace{(1-p)\,(1-c(1-m))}_{\substack{\text{Uninformative report} \\ \text{classified as } R_G}}, \tag{4}$$

$$P_S(R_G|\theta_B) = \underbrace{(1-p)(1-c)}_{\substack{\text{Uninformative report} \\ \text{classified as } R_G}} + \underbrace{m(p+(1-p)c)}_{\substack{\text{Signal } S_B \\ \text{reported as } R_G}}, \tag{5}$$

which gives:

$$\begin{aligned} P_S(\theta_G|R_G) &= \frac{P_S(R_G|\theta_G)\alpha_S}{P_S(R_G|\theta_G)\alpha_S + P_S(R_G|\theta_B)(1-\alpha_S)} \\ &= \alpha_S \frac{p+(1-p)\,(1-c(1-m))}{p+(1-p)\,(1-c(1-m)) - (1-\alpha_S)p(1-m)}. \end{aligned} \tag{6}$$

Note that $P_S(\theta_G|R_G)$ is declining in m. For the extreme in which $m = 1$ we have $P_S(\theta_G|R_G) = \alpha_S$ and $P_S(\theta_G|R_G)X - I < 0$. This is intuitive because the report has no information content when $m = 1$. Thus, to ensure that assumption (3) is satisfied, we have to assume that the parameters are such that m is not too large.

Our results depend on the manager having a preference to expand after an inconclusive signal, while the board prefers not to expand. There are a variety of ways to accomplish this. In our main analysis, we model the manager as having a gross payoff of B if the project succeeds, and zero otherwise. We ignore the setting of an optimal contract to keep the setting simple and tractable while maintaining a conflict of interest with respect to reporting choices.

There are several ways to interpret B. One interpretation is that B represents a preference for empire-building, as in Stein (1997) or Scharfstein and Stein (2000). Alternatively, if the manager's pay consists of stock options with a strike price equal

to the firm's no-expansion value, then B is proportional to the net profit $X - I$ from a successful expansion effort. B could also represent the reputation benefits from leading a successful expansion. We refer to B as the manager's private benefits and the product $\alpha_C B$, the manager's gross *ex ante* value of expansion, as his or her 'expansion bias.'

By construction, the manager does not internalize the cost of failed expansion and prefers expansion unless he or she knows the state is bad (θ_B). Our results are nearly identical if we model the manager as internalizing the cost I of failed investment so long as the manager's prior α_C is sufficiently high such that the manager perceives a positive *ex ante* NPV from expanding ($\alpha_C X > I > \alpha_S X$). In other words, we obtain similar results even if we assume that the manger is benevolent so long as the manager is sufficiently optimistic.

3 Manager behavior

In this section, we determine the manager's manipulation strategy, conditional on the level of conservatism. The manager restructures the accounting system (chooses m) prior to the signal realization to maximize his expected payoff:

$$U_M = \underbrace{\left(p + (1-p)\left(1 - c(1-m)\right)\right)\alpha_C}_{P_C(\text{Successful expansion}) = P_C(R_G, \theta_G)} B - \frac{k}{2}m^2, \tag{7}$$

The manager's preferences can be explained as follows. The manager only receives a positive payoff when the state is good (which, from the manager's perspective, happens with probability α_C) and the project is implemented. Assuming a good state, the probability of expansion (i.e., the probability of a high report) can be decomposed into two terms. With probability p, the good state generates a good report. With

probability $1-p$, the good state generates an inconclusive signal. The inconclusive signal maps to a bad report if it is initially classified as bad, with probability c, and the manager's manipulation fails, with probability $1-m$. In other words, the inconclusive signal maps to a bad report with probability $c(1-m)$ and to a good report with probability $1-c(1-m)$. The cost of altering the accounting system is $0.5km^2$. The manager's choice of m satisfies:

$$m = (1-p)c\ \alpha_C B/k. \tag{8}$$

Equation (8) is intuitive. The manager knows that his manipulation effort will have a positive effect on his payoff only if the state is good but the signal is bad, which occurs with probability $\alpha_C(1-p)c$. Otherwise, if the signal is good, there is no need to manipulate and any effort allocated to distorting the accounting system is wasted; and if the state is bad, the manager does not wish to implement the project because it will fail.

The following comparative statics results follow immediately from (8):

Lemma 1 *The manager's choice of manipulation, m, increases if*
(i) the accounting system is more conservative (c is higher),
(ii) the accounting system is less informative (p is lower),
(iii) the quality of corporate governance is weaker (k is lower),
(iv) the manager has private benefits (B is larger),
(v) the manager is more optimistic (α_C is higher).

The manager's desire to manipulate the accounting system arises from the conflict of interest regarding project implementation. For signals that are inconclusive, the board prefers the status quo whereas the manager prefers expansion. For negative

evidence, the board again prefers the status quo whereas the manager is indifferent between expansion and the status quo.

Successful manipulation of the accounting system is beneficial for the manager because it ensures expansion even when the signal is inconclusive and classified as bad. As the information system becomes more conservative (high c) or less reliable (low p), a bad signal S_B is more likely to reflect inconclusive evidence that holds out a possibility for successful expansion, which increases the benefits of manipulation.

This argument implies that the board can eliminate manipulation simply by choosing an aggressive accounting system ($c = 0$). For $c = 0$, uninformative signals are always classified as good, triggering expansion as desired by the manager. Of course, the manager could still engage in manipulation to ensure that bad signals are also misreported. But for $c = 0$ bad signals are indicative of bad states, and even the manager does not wish to expand if failure is certain.

The parameter k captures the quality of corporate governance with respect to monitoring the reporting process. It can be viewed as a reduced form representation of board oversight, legal enforcement, litigation risk, tightness of the accounting system, auditor quality, and so forth. When the marginal cost of manipulation is smaller, it is easier for the manager to successfully manipulate the accounting system, fostering manipulation effort. However, the overall effect of k on manipulation also depends on how it impacts the board's choice of c, as we discuss in the next section.

When the manager has greater private benefits B or is more optimistic α_C, he has a stronger incentive to manipulate the report to ensure expansion. The higher private benefits induce manipulation by increasing the reward to successful expanding. Optimism makes the manager place greater value on an uninformative report and more likely to interpret S_B as a false negative (generated from an uninformative report

rather than an informative report about θ_B). Both forces make the manager more willing to manipulate the report. However, for $c = 0$, even an optimistic manager will have no incentive to manipulate the accounting system because a bad signal is a perfect indicator that the project will fail.

4 Optimal accounting system

In this section, we study the optimal design of the accounting system from the shareholders' perspective.[7] The board (acting in the best interests of the shareholders) chooses c to maximize firm value:

$$U_S = P(R_G)\left(P(\theta_G|R_G)X - I\right), \tag{9}$$

Using (6) and $P(R_G) = m + (1-m)(\alpha_S p + (1-p)(1-c))$, (9) can be written as

$$U_S = \underbrace{\alpha_S X - I}_{\substack{\text{Loss if firm} \\ \text{always expands} \\ (\alpha_S X - I < 0)}} + \underbrace{p(1-m)(1-\alpha_S)I}_{\substack{\text{Save } I \text{ when } \theta_B \text{ yields} \\ S_B \text{ and manager fails to} \\ \text{reclassify as } R_G}} + \underbrace{(1-p)c(1-m)(I-\alpha_S X)}_{\substack{\text{Avoid investment when signal} \\ \text{is uninformative and manager} \\ \text{fails to reclassify as } R_G}}. \tag{10}$$

The shareholders' preference function (10) can be explained in an intuitive way. If the board always allowed expansion, the firm would earn the negative $\alpha_S X - I < 0$ *ex ante* NPV. By relying on the accounting system, it avoids expanding when state θ_B generates an informative signal S_B, so long as the manager fails to successfully

[7] Alternatively, we could consider a standard setter that designs the accounting system to maximize social welfare. Social welfare is the aggregate utility of shareholders and the manager. While social welfare includes the manager's personal cost of manipulation, we are unsure to what extent a standard setter would recognize this cost. We therefore could weight the cost by a multiplier $\lambda \in [0, 1]$ in the standard setter's preference function. In that case the standard setter would also weight the benefits the manager reaps through manipulation by λ. We show in the appendix, that our results are robust to this alternative modeling choice (regardless of the weight λ).

manipulate the report. In addition, the board avoids investment after an uninformative signal so long as the signal is classified as S_B, which occurs with probability c, and the manager fails to manipulate the report.

A change in the level of conservatism affects firm value U_S directly, via its effect on classifying an uninformative signal, and indirectly, via its impact on manipulation. To study the direct effect of conservatism, suppose for the moment that the level m of manipulation is fixed. An increase in conservatism is beneficial for shareholders as it helps avoid expansion when the signal is uninformative; that is, the third term in (10) increases with c. This direct effect of an increase in c gets weaker as m increases because conservatism only influences the investment decision when the manager's manipulation attempt fails (which happens with probability $(1-m)$). Nevertheless, for a fixed $m < 1$, it is strictly optimal to choose the maximum level of conservatism ($c = 1$).

However, the manager's choice of manipulation is not fixed but changes with the level of accounting conservatism. A conservative accounting system ($c > 0$) provides the manager with an incentive to manipulate because inconclusive evidence will sometimes be classified as bad. As conservatism increases, the manager becomes more concerned that projects are rejected based on inconclusive evidence and hence has a stronger incentive to manipulate the system (Lemma 1). Heightened manipulation effort is costly to shareholders because it increases the probability of project implementation after inconclusive or, even worse, negative signals. That is, manipulation reduces the second and third term in (10).

When setting c, the board balances the benefit of avoiding investment following an uninformative signal against the costs associated with manipulation. Assuming an interior solution, the first-order condition for the optimal level of c can be stated

as follows, after substituting from (8) for m:

$$0 = -p(1-p)(1-\alpha_S)I\frac{\alpha_C B}{k} + (1-p)(I-\alpha_S X)\left(1-2c(1-p)\frac{\alpha_C B}{k}\right)$$
$$\Longrightarrow \qquad c = \frac{1}{2(1-p)}\left(\frac{k}{\alpha_C B} - p\frac{(1-\alpha_S)I}{I-\alpha_S X}\right). \quad (11)$$

Condition (11) shows the importance of assuming that the unconditional NPV is negative ($\alpha_S X - I < 0$). If the *ex ante* NPV is positive ($\alpha_S X - I > 0$), the trade-off outlined above is moot: the board wishes to (i) expand even when the signal is inconclusive, and (ii) eliminate manipulation incentives. Both goals can be achieved by choosing an aggressive system ($c = 0$), that classifies uninformative signals as good. With an aggressive system, the manager has no incentive to manipulate bad signals, so that a bad signal always leads to a bad report that induces the board to reject the expansion decision. From (11), we see that the board chooses conservative accounting ($c > 0$) when the manager faces sufficiently high governance constraints k relative to private benefits $\alpha_C B$ $\left(\frac{k}{\alpha_C B} > p\frac{(1-\alpha_S)I}{I-\alpha_S X}\right)$. If the manager faces relatively low incentives to manipulate $\left(\frac{k}{\alpha_C B} > p\frac{(1-\alpha_S)I}{I-\alpha_S X} + 2(1-p)\right)$, then the board chooses maximum conservatism ($c = 1$). The following proposition summarizes:

Proposition 1 *There is an interior solution, $c \in (0,1)$, if and only if :*

$$\underbrace{p\frac{(1-\alpha_S)I}{I-\alpha_S X}}_{For\ c>0} < \frac{k}{\alpha_C B} < \underbrace{p\frac{(1-\alpha_S)I}{I-\alpha_S X} + 2(1-p)}_{For\ c<1}. \quad (12)$$

In an interior solution, the optimal level of conservatism is:

$$c^* = \frac{1}{2(1-p)}\left(\frac{k}{\alpha_C B} - p\frac{(1-\alpha_S)I}{I-\alpha_S X}\right), \quad (13)$$

with manipulation:

$$m^* = \frac{1}{2}\left(1 - p\frac{(1-\alpha_S)I}{I-\alpha_S X}\frac{\alpha_C B}{k}\right) < \frac{1}{2}. \tag{14}$$

The Appendix gives the parameter regions for which the assumptions (3) and (12) hold. Essentially, the assumptions exclude extreme divergence between the manager's and board's preference to expand. In such cases, the board requires convincing evidence in order to agree to expand (large *ex ante* loss $I - \alpha_S X$), but the manager's incentive to manipulate is so high (low $\frac{k}{\alpha_C B}$) that he is unable to provide convincing evidence.

5 Comparative Statics

5.1 Effect of environmental changes on optimal accounting system

In order to analyze the effects of parameters on the accounting system, we state the board's first order condition as:

$$0 = \underbrace{(1-p)\left(1-(1-p)c\frac{\alpha_C B}{k}\right)(I-\alpha_S X)}_{\frac{\partial U_S}{\partial c}>0} \underbrace{-\left(p(1-\alpha_S)I + (1-p)c(I-\alpha_S X)\right)}_{\frac{\partial U_S}{\partial m}<0} \underbrace{(1-p)\frac{\alpha_C B}{k}}_{\frac{dm}{dc}>0}. \tag{15}$$

The first term of (15) represents the beneficial direct effect of conservatism, whereby investors avoid expansion after an uninformative signal. The second term reflects the indirect effect of conservatism via its impact on accounting manipulation. The equilibrium c equates these two forces. The following proposition states the effect of the model's parameters on c.

Proposition 2 *The firm's optimal level of conservatism c is increasing in the* ex ante *loss* $I - \alpha_S X$ *of expanding and the strength* k *of corporate governance. Conservatism is decreasing in the manager's optimism* α_C *and private benefits* B*. The level of conservatism c is increasing in informativeness p if and only if the ability to mitigate manipulation is sufficiently large relative to the* ex ante *loss* $\left(\frac{k}{\alpha_C B} > \frac{(1-\alpha_S)I}{I-\alpha_S X}\right)$.[8]

In terms of expression (15), a higher $I - \alpha_S X$ increases both the direct benefit of conservatism ($\frac{\partial^2 U_S}{\partial c \partial (I-\alpha_S X)} > 0$) and the costs of inducing manipulation ($\frac{\partial^2 U_S}{\partial m \partial (I-\alpha_S X)} < 0$). For $m < \frac{1}{2}$, which holds in equilibrium per Proposition 1, the former, direct effect dominates and results in a higher c.

An increase in governance strength k has two effects, both of which work to increase c. First, a higher k is associated with less manipulation and hence a lower probability that the report is distorted, which increases the direct benefit of conservative accounting ($\frac{\partial^2 U_S}{\partial c \partial k} > 0$). Second, higher k weakens the positive relation between conservatism and manipulation ($\frac{d^2 m}{dcdk} < 0$), which decreases the associated indirect costs of conservative accounting (from $\frac{\partial U_S}{\partial m} < 0$). Both of these effects – increasing the benefits of conservative accounting and reducing its costs – motivate the board to choose more conservative accounting. Because k affects c through the term $\frac{k}{\alpha_C B}$, the expansion bias parameters α_C and B have the opposite effects. The impact of governance quality k is the opposite of that in Gao (2012) where accounting becomes more conservative when earnings are easier to manipulate. Whereas conservatism counteracts earnings management in Gao (2012) and Chen, Hemmer, and Zhang (2007), conservatism *induces* earnings management in our setting by making the manager wish to reclassify bad signals that he perceives may have been produced by inconclu-

[8] If the baseline accounting system is insufficiently informative ($p < \sqrt{2} - 1 \approx 0.41$), then c is always decreasing in p. In other words, when $p < \sqrt{2} - 1$, there are no values of the paremeters $(I, X, \alpha_S, \alpha_C, B, k)$ such that $c \in (0, 1)$, assumption (3) is satisfied, and $\frac{k}{\alpha_C B} > \frac{(1-\alpha_S)I}{I-\alpha_S X}$.

sive evidence.

An increase in the accounting system's overall informativeness p reduces the direct benefit of conservative accounting ($\frac{\partial^2 U_S}{\partial c \partial p} < 0$) because a lower probability of an uninformative signal reduces the expected costs of classifying uninformative signals as good. More informative accounting systems also reduce the costs of conservative accounting because the manager has less of an incentive to manipulate when he knows that a bad signal more likely indicates a bad state. When governance is sufficiently effective in constraining manipulation (high $\frac{k}{\alpha_C B}$), the effect on manipulation dominates so that c is increasing in p.

5.2 Effect of environmental changes on equilibrium manipulation and firm value

We now turn to the question how changes in the parameters affect the level of manipulation and firm value.

Proposition 3 *The equilibrium level of manipulation m is increasing in the strength k of corporate governance and the* ex ante *loss $I - \alpha_S X$ of expanding, and is decreasing in manager's optimism α_C, private benefits B, and the informativeness p.*

At first glance, the results concerning the *ex ante* loss from expanding and the strength of governance may appear to be counterintuitive. The effect of $I - \alpha_S X$ on manipulation arises because it has no direct effect on m, but, as shown in Proposition 2, it increases conservatism c. The more conservative accounting induces the manager to increase manipulation.

An increase in k has a direct negative effect on manipulation. However, Proposition 2 shows that the board reacts to an increase in k by choosing more conservative

accounting, which, in turn, increases manipulation incentives. The indirect effect via conservatism dominates the direct effect, yielding a positive relation between k and manipulation. Likewise, optimism α_C and private benefits B have a direct positive effect on manipulation, but the boards response of a lower c dominate so that an increase in α_C or B leads to lower manipulation.

From (8), an increase in informativeness p has a direct effect of reducing manipulation m, which occurs because the manager only benefits from manipulating uninformative signals. When p is high, a bad signal more likely indicates a bad state in which the manager does not benefit from expansion. Proposition 2 shows that an increase in p sometimes increases conservatism c, which leads to an increase in manipulation. However, the direct effect dominates so that manipulation incentives decline when the accounting system becomes more informative.

We next analyze how changes in the parameters affect the efficiency of the investment decision and hence firm value.

Proposition 4 *Investment efficiency* (U_S) *is increasing in the informativeness* p *of the accounting system and in the strength* k *of corporate governance.* U_S *is decreasing in the manager's optimism* α_C*, private benefits* B*, and the* ex ante *loss* $I - \alpha_S X$ *of expanding.*

Proposition 4 follows from applying the envelope theorem to the board's objective function. Keeping c constant, an increase in k directly decreases manipulation, reducing shareholder value. The board responds to the change in k by increasing the level of accounting conservatism, which ultimately leads to more manipulation as shown in Proposition 3. But, by the envelope theorem, this indirect effect on U_S via c can be ignored and the shareholders' payoff is increasing in k. Because k affects

U_S through the ratio $\alpha_C B/k$, this implies that investment efficiency is decreasing in both the agency conflict β and manager optimism α_C. The effect of a higher *ex ante* loss $I - \alpha_S X$ on U_S reflects that it is associated with a lower payoff to shareholders.

The informativeness p of the accounting system improves investment efficiency in two ways. First, holding conservatism c and manipulation m fixed, U_S is increasing in p because it increases the probability that a bad state results in a bad report, so that the board rejects expansion. Second, keeping c fixed, from (8) we know that manipulation m is decreasing in p, giving a further improvement in U_S. By the envelope theorem, we can ignore the effect of p on c when assessing the impact on the optimized U_S.

6 Empirical Predictions and Discussion

Our analysis of the board's choice of conservatism in Proposition 2 pertains to the board's choice of the baseline accounting system. However, empiricists observe only the outputs of the accounting system, which also reflect manipulation. Manipulation drives a wedge between the board's accounting choices and the conservatism reflected in the financial statements. We take the probability $P_S(R_B)$ of a bad report as an observable measure of conservative accounting. A direct empirical analog would be the incidence of large negative net income (e.g., Barth, Landsman, and Lang 2008).

The denominator of expression (6) gives $P_S(R_G)$, from which we can compute $P_S(R_B) = ((1-p)c + (1-\alpha_S)p)(1-m)$. Were it not for the $1-m$ term, the probability $P_S(R_B)$ of a bad report provides a clear proxy for the board's choice of c. Propositions 2 and 3 show that conservatism c and manipulation m vary together with the expansion bias $\alpha_C B$, governance k, and the *ex ante* loss $I - \alpha_S X$ from

expanding. Because $P_S(R_B)$ is increasing in c and decreasing in m, an increase in c will be partially offset by an increase in m. The effect on c dominates so that, like the conservatism parameter, observed conservatism $P_S(R_B)$ is increasing in $I - \alpha_S X$ and k, and is decreasing in α_C and B.[9]

We can therefore interpret the effect of $I - \alpha_S X$ on observed conservatism $P_S(R_B)$ as implying that firms with few profitable growth opportunities will have relatively more conservative accounting. This differs from Bagnoli and Watts (2005) where managers may use conservative accounting to signal private information. In our setting, the board and shareholders know the manager's prior belief regarding the value of expansion and there is no role for signaling. Just as conservative accounting is beneficial to induce abandonment of negative NPV projects (Gigler, Kanodia, Sapra, and Venugopalan 2009), conservative accounting becomes more attractive when expansion is not justified based on *ex ante* beliefs.

Prior empirical studies (e.g., Watts 2003a,b; Ahmed and Duellman 2007; García Lara, García Osma, and Penalva 2009) and analytical work (e.g., Kwon, Newman, and Suh 2001; Gao 2012) have discussed accounting conservatism as a tool for corporate governance, particularly in regard to mitigating earnings manipulations. Our model suggests that the empirical association between conservatism and corporate governance may also run in the opposite direction – accounting conservatism is a tool that can only be used by well-governed firms. Because conservative accounting increases the manager's incentive to manipulate earnings, it is a cost-efficient reporting scheme only for firms with sufficient monitoring in place to mitigate conservatism's

[9]This conclusion follows from direct computations of the derivatives of $P_S(R_B)$. Signing $dP_S(R_B)/dk$ requires the use of the parameter restrictions $\frac{k}{\alpha_C B} > p\frac{(1-\alpha_S)I}{I-\alpha_S X}$ and $\frac{(1-\alpha_S)I}{I-\alpha_S X} > 1$, discussed in the Appendix, necessary for an interior value $c \in (0,1)$ and a negative *ex ante* NPV of expanding.

impact on earnings management. In addition, we predict that accounting becomes more *aggressive* as agency problems increase, which occurs because conservative accounting exacerbates the manager's incentive to manipulate earnings.

Summarizing, we have the following predictions regarding the observed level of conservatism:

Prediction 1 *The observed level of conservatism $P_S(R_B)$ is greater for:*
(i) Firms with fewer valuable growth opportunities (higher $I - \alpha_S X$)
(ii) Firms with effective monitoring, low private benefits, and low managerial optimism (high k and low B, α_C)

As was the case with the board's choice c of conservatism, empiricists cannot directly observe the managers' manipulation choice m. The corresponding observable feature of the reporting environment is detected manipulations. If detection requires a failed expansion, where expansion only follows a good report, the probability of detected manipulation will be $P_S(\theta_B, R_G, S_B)$ – a failed expansion that later investigation reveals to have been based on an underlying bad signal S_B. Direct computations show that the effects of the *ex ante* loss $I - \alpha_S X$, governance k, optimsim α_C, private benefits B, and informativeness p on detected manipulation $P_S(\theta_B, R_G, S_B)$ have the same signs as on the actual manipulation m given in Proposition 3.[10] This yields the following predictions, which are in the same direction as those for observed conservatism due to the positive link between conservative accounting and the incentive to manipulate earnings:

[10] Signing the derivative of $P_S(\theta_B, R_G, S_B)$ with respect to p requires accounting for the parameter restrictions that $\frac{k}{\alpha_C B} > p\frac{(1-\alpha_S)I}{I-\alpha_S X}$ and $\frac{(1-\alpha_S)I}{I-\alpha_S X} > 1$.

Prediction 2 *Detected manipulations $P_S(\theta_B, R_G, S_B)$ are greater for:*
(i) Firms with fewer valuable growth opportunities (higher $I - \alpha_S X$)
(ii) Firms with effective monitoring, low private benefits and low managerial optimism (high k and low B, α_C)
(iii) Firms where current earnings are less informative about future growth opportunities (low p)

While we predict that firms with stronger governance experience more accounting manipulation, this does not imply that governance reduces firm value. Proposition 4 indicates that company value is increasing in the effectiveness of monitoring (high k, low α_C, B). The higher manipulation in well-governed firms is a byproduct of their choice of more conservative accounting. The effect of higher conservatism dominates the partially offsetting impact of higher earnings management so that firms with effective monitoring are less likely to invest absent an informative, positive signal.

All of these predictions are counterintuitive but can be explained by the observation that the board optimally responds to changes in the environment that mute (foster) manipulation incentives by adjusting the level of conservatism, which, in turn, strengthens (weakens) manager's desire to distort the accounting system. In our setting, given that the only goal of the reporting system is to facilitate investment decisions, an accounting system is of better quality if it leads to better investment decisions. The above analysis demonstrates that the presence of manipulation need not be an indicator of poor reporting quality. On the one hand, manipulation associated with a low level of informativeness p indicates poor reporting quality. On the other hand, manipulation can also be associated with effective monitoring (low τ_C), which is also associated with conservative reporting and efficient investment decisions that

are indicative of high reporting quality. Our results suggest that empirical researchers should be careful when using the magnitude of manipulation in firms as a proxy for reporting quality – it is not always true that less manipulation actually represents an environment with better financial reporting.

7 Conclusion

This study provides an alternative rationale for a positive relation between corporate governance and conservative accounting. In our setting, shareholders prefer conservative accounting because it facilitates an efficient choice of whether to expand the firm's operations. However, conservative accounting provides an incentive for the manager to manipulate the accounting system. In particular, the manager has a preference for expanding the firm so long as there is some possibility of expansion paying off. The more conservative the underlying accounting system, the more likely the manager believes that a bad signal might conceal an opportunity to successfully expand the firm. The positive relation between governance and conservatism arises because only well-governed firms can sufficiently mitigate the earnings management incentives created by conservative accounting. Our prediction that earnings manipulation increases with conservative accounting allows our explanation for the relation between conservatism and governance to be distinguished from theoretical explanations in prior studies. Also, our results suggest that earnings manipulation need not be a symptom of poor monitoring.

The firm's growth opportunities play a key role in our analysis. *Ex ante*, shareholders prefer not to expand the firm's operations. This creates an incentive for conservative reporting systems that classify uninformative accounting signals as bad

reports that do not lead to expansion. The worse the growth opportunities, the more conservative the firm's accounting will be, which leads to greater manipulation incentives.

Overall, our model provides an alternative perspective on the relation between corporate governance and conservative accounting. The prior literature has primarily focused on conservative accounting being an accounting choice that only well-governed firms would prefer, absent any constraints. In our setting, all firms prefer conservative accounting, but only well-governed firms can afford it.

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A Appendix

Derivation of valid parameter ranges

Here we define the parameter restrictions that yield $c, m \in (0,1)$ and positive NPV after a good report ($P_S(\theta_G|R_G)X - I > 0$). We first state the restrictions, and then sketch the derivations of the restrictions. The conditions are the following:

$$\begin{aligned}
&\frac{(1-\alpha_S)I}{I-\alpha_S X} > \frac{1}{p}: \\
&\quad p\frac{(1-\alpha_S)I}{I-\alpha_S X} < \frac{k}{\alpha_C B} < p\frac{(1-\alpha_S)I}{I-\alpha_S X} + 2(1-p), \\
&\underbrace{\frac{1}{2p}\left(\sqrt{5-4p}+2p-1\right)}_{\in(1,1/p)\forall p\in(0,1)} < \frac{(1-\alpha_S)I}{I-\alpha_S X} < \frac{1}{p}: \\
&\quad 2 - p\frac{(1-\alpha_S)I}{I-\alpha_S X} + 2\sqrt{1-p\frac{(1-\alpha_S)I}{I-\alpha_S X}} < \frac{k}{\alpha_C B} < p\frac{(1-\alpha_S)I}{I-\alpha_S X} + 2(1-p),
\end{aligned} \tag{A.1}$$

and there are no solutions with $c, m \in (0,1)$ and $P_S(\theta_G|R_G)X - I > 0$ when $\frac{(1-\alpha_S)I}{I-\alpha_S X} < \frac{1}{2p}\left(\sqrt{5-4p}+2p-1\right)$.

Proposition 1 gives the constraints for $c \in (0,1)$, which gives the upper end of the intervals in (A.1). The other relevant constraint is that $P_S(\theta_G|R_G)X - I > 0$, which we can restate as:

$$\frac{p(1-m)\frac{(1-\alpha_S)I}{I-\alpha_S X} + c(1-p)(1-m) - 1}{(1-p)\left(1-c(1-m)\right) + p\left(1-(1-\alpha_S)(1-m)\right)} > 0. \tag{A.2}$$

The denominator of the left-hand-side of (A.2) is positive, so that the sign depends on the numerator. In order to economize on notation, we can put $z = \frac{(1-\alpha_S)I}{I-\alpha_S X}$ and $y = \frac{k}{\alpha_C B}$, and substitute the equilibrium c and m from Proposition 1 into the numerator

in (A.2) to get the condition:

$$\frac{y^2 - 2(2 - pz)y + p^2z^2}{4y} > 0, \tag{A.3}$$

which, because $y > 0$, holds if and only if $y \notin 2 - pz \pm 2\sqrt{1 - pz}$. If $z > \frac{1}{p}$, then the $\sqrt{1 - pz}$ term is complex and (A.3) always holds. In this case, the positive NPV condition adds no additional constraints to those from Proposition 1, giving the first interval in (A.1). If $z < \frac{1}{p}$, the $2 - pz - 2\sqrt{1 - pz} < pz$ root is irrelevant since $c > 0$ requires $y > pz$ (the left inequality in (12)). The relevant root is then $2 - pz + 2\sqrt{1 - pz}$, which appears as the lower end of the second interval in (A.1). The second interval in (A.1) is only valid if $2 - pz + 2\sqrt{1 - pz} < pz + 2(1 - p)$, which, given that $X > I$ and $\alpha_S X - I < 0$ imply $z > 1$, requires that $z > \frac{1}{2p}\left(\sqrt{5 - 4p} + 2p - 1\right)$. Combining the conditions gives (A.1). ∎

Alternative objective for setting c and proof of Proposition 1

The proof of Proposition 1 is fairly straightforward. We prove it here as a special case of a setting where a regulator determines c to maximize social welfare. Given a weight λ that measures the importance of the manager's utility U_M, given by (7), relative to the shareholders' utility U_S, given by (10), we have the regulator's objective:

$$\max_c U_S + \lambda U_M, \tag{A.4}$$

which has the following first-order condition:

$$\begin{aligned} 0 &= \frac{dU_S}{dc} + \lambda \frac{dU_M}{dc} \qquad (A.5) \\ &= \underbrace{-p\frac{\alpha_C B}{k} + \frac{I-\alpha_S X}{(1-\alpha_S)I}\left(1-2c(1-p)\frac{\alpha_C B}{k}\right)}_{\propto dU_S/dc} + \frac{\lambda k}{(1-\alpha_S)I}\underbrace{\left(-\frac{\alpha_C B}{k}\left(1-c(1-p)\frac{\alpha_C B}{k}\right)\right)}_{\propto dU_M/dc}. \end{aligned}$$

Solving (A.5) for c gives the following, which simplifies to (13) when the weight on the manager $\lambda = 0$:

$$c = \frac{1}{2(1-p)} \frac{\frac{k}{\alpha_C B} - \frac{(1-\alpha_S)I}{I-\alpha_S X}(p + \frac{\lambda k}{(1-\alpha_S)I})}{1 - \frac{\lambda}{2}\frac{\alpha_C B}{I-\alpha_S X}}. \qquad (A.6)$$

Direct computations show that conservatism and manipulation are both lower when the objective also includes the manager's utility. In other words, conservatism c is decreasing in λ, which implies that manipulation is decreasing in λ, as well. This follows directly from the manager perceiving a positive *ex ante* value of expanding.

Direct computations show that $m, c \in (0,1)$ if the following holds, where $y = \frac{k}{\alpha_C B}$, $z = \frac{(1-\alpha_S)I}{I-\alpha_S X}$, and $\lambda_2 = \frac{\lambda k}{(1-\alpha_S)I}$:

$$(p+\lambda_2)z < y < (pz + 2(1-p))\frac{1}{2}\left(1 + \sqrt{1 + \frac{z^2\lambda_2(2p+\lambda_2)}{(pz+2(1-p))^2}}\right) + \frac{1}{2}z\lambda_2. \qquad (A.7)$$

The above inequalities simplify to (12) as $\lambda \to 0$. Both the upper and lower bounds are shifted upward relative to the bounds in (12).

For any $\lambda > 0$, the comparative statics in Propositions 2, 3, and 4 are the same as given in the main body except for the following exception. In Proposition 2, $\frac{k}{\alpha_C B} > \frac{(1-\alpha_S)I}{I-\alpha_S X}$ is a necessary and sufficient condition for c to be increasing in p, but it is only a necessary condition when the choice of c places positive weight on the manager's

objective ($\lambda > 0$). Proving that U_S is increasing in $\frac{(1-\alpha_S)I}{I-\alpha_S X}$ requires first establishing that $\frac{d^2 U_S}{d\left(\frac{(1-\alpha_S)I}{I-\alpha_S X}\right) d\lambda_2} < 0$, and then taking the limit $\lim_{\lambda_2 \to \infty} dU_S/d\left(\frac{(1-\alpha_S)I}{I-\alpha_S X}\right)$, which equals zero. Because U_S is increasing in $\frac{(1-\alpha_S)I}{I-\alpha_S X}$ for $\lambda = 0$ case in the main body, this implies that U_S is increasing in $\frac{(1-\alpha_S)I}{I-\alpha_S X}$ for all positive λ. ∎

Proof of Proposition 2

The statements on the effects of parameters follow directly from computations of the derivatives of c^* as given in expression (13). The parameter restrictions for $dc/dp > 0$ follow because $\frac{k}{\alpha_C B} > \frac{(1-\alpha_S)I}{I-\alpha_S X}$ requires that $\frac{(1-\alpha_S)I}{I-\alpha_S X} < p\frac{(1-\alpha_S)I}{I-\alpha_S X} + 2(1-p)$, the highest possible value of $\frac{k}{\alpha_C B}$, for cases with an interior solution. The inequality $\frac{(1-\alpha_S)I}{I-\alpha_S X} < p\frac{(1-\alpha_S)I}{I-\alpha_S X} + 2(1-p)$ holds if and only if $\frac{(1-\alpha_S)I}{I-\alpha_S X} < 2$. The derivation of the parameter ranges states that we obtain interior solutions for $\frac{(1-\alpha_S)I}{I-\alpha_S X} > \frac{1}{2p}\left(\sqrt{5-4p} + 2p - 1\right)$. For there to be any parameters with $dc/dp > 0$ we must have $\frac{1}{2p}\left(\sqrt{5-4p} + 2p - 1\right) < 2$, which holds if $p < \sqrt{2} - 1 \approx 0.41$. ∎

B Alternative cost function

In this Appendix, we discuss an alternative formulation where the manager incurs the manipulation cost only when attempting to manipulate following a bad signal S_B. In this setting, the manager's objective function is:

$$\underbrace{\frac{(1-p)c\ \alpha_C}{(1-p)c + p(1-\alpha_C)}}_{P_C(\theta_G|S_B)} \underbrace{m}_{P_C(R_G|S_B)} B - \frac{k}{2}m^2. \tag{B.1}$$

Solving the manager's first-order condition gives $m = \frac{(1-p)c}{(1-p)c+p(1-\alpha_C)p}\frac{\alpha_C B}{k}$, bounded above by 1. The second-order condition is satisfied by $k > 0$. The board's objective

is identical to (9). This setting affects how m reacts to c. Direct computations show that $\frac{dm}{dc} \geq 0$, with equality for $m = 1$, and that the board's second-order condition is never satisfied:

$$\frac{d^2U_S}{dc^2} = \underbrace{\frac{2(1-p)p\left((X-I)\alpha_S + \alpha_C(I-\alpha_S X)\right)}{(1-p)c + (1-\alpha_C)p}}_{>0 \text{ because } I<X<\frac{1}{\alpha_S}I} \underbrace{\frac{dm}{dc}}_{\geq 0}. \tag{B.2}$$

The board therefore adopts a corner solution of $c \in \{0, 1\}$. The board chooses between:[11]

$$U_S(c=0) = \alpha_S X - I + p(1-\alpha_S)I, \tag{B.3}$$

where $c = 0$ implies that $m = 0$, and:

$$U_S(c=1) = \alpha_S X - I + (1-m)\left(p(1-\alpha_S)I + (1-p)(I-\alpha_S X)\right). \tag{B.4}$$

The board's choice then depends on:

$$U_S(c=1) - U_S(c=0) = \underbrace{(1-p)(I-\alpha_S X)}_{\substack{\text{Avoid investing after} \\ \text{uninformative signal}}} - \underbrace{m\left((1-p)(I-\alpha_S X) + p(1-\alpha_S)I\right)}_{\text{Invest after successful manipulation}}. \tag{B.5}$$

Expression (B.5) implies that the board chooses conservative accounting ($c = 1$) if:

$$m < \frac{1}{1 + \frac{p}{1-p}\frac{(1-\alpha_S)I}{I-\alpha_S X}} \quad \Leftrightarrow \quad \frac{k}{\alpha_C B}(1-\alpha_C p) > 1 + p\left(\frac{(1-\alpha_S)I}{I-\alpha_S X} - 1\right). \tag{B.6}$$

[11] If p is too small, a positive report does not sufficiently alter the board's prior beliefs that expansion has a negative NPV, and the board never expands. Formally, $U_S(c=0)$ is positive only when p i for $p > \frac{I-\alpha_S X}{(1-\alpha_S)I}$, where $I < X < \frac{1}{\alpha_S}I$ implies that $\frac{I-\alpha_S X}{(1-\alpha_S)I} \in (0, 1)$.

In our primary setting, conservatism and manipulation both increase in the strength k of governance and the *ex ante* loss $I - \alpha_S X$ (See Propositions 2 and 3). Here, a sufficiently high k and/or $I - \alpha_S X$ are needed to satisfy (B.6) so that conservatism and manipulation will occur.