Independent Auditors, Bias, and Political Agency

Patrick L. Warren*
John E. Walker Department of Economics
Clemson University
August, 2011

This paper analyzes political agency with endogenous information collection and revelation by third-party auditors. While increasing incentives for auditors to provide information straightforwardly improves political control, a small amount of pro-incumbent bias can also be useful for maintaining high levels of control. When the equilibrium level of control is high, most investigations uncover positive information about the incumbent. Since positive information increases reelection rates, mildly pro-incumbent auditors are willing to work harder than unbiased auditors in these equilibria. For moderate levels of control, pro-incumbent auditors are again useful due to their extra effort, even though they may suppress some negative information in equilibrium. Only when market incentives are low, so equilibrium control is weak, are unbiased or anti-incumbent biased auditors better for voters than mildly pro-incumbent auditors.

JEL Classification: D72, D83, H83, L82, M42
Keywords: Accountability; Media; Investigators; Journalists; Bias; Auditors; Political Agency

*Contact:patrick.lee.warren@gmail.com This work was begun while studying under a National Science Foundation Graduate Research Fellowship. I want to thank Daron Acemoglu, Florian Ederer, Leopoldo Fergusson, John Gasper, Bob Gibbons, Gabe Lenz, John Patty, Pablo Querubin, David Singer, Jim Snyder, Charles Thomas, Eric Weese, Tom Wilkening, the participants of the MIT Organizational Economics Lunch, and the MIT Political Economy Breakfast. The editor and referees have helped me to improve this paper enormously. An earlier version was presented at the Southern Political Science Association 2008 annual meeting.
1 Introduction

The ballot box is the instrument of control that has received the most attention in the formal literature on political agency. Scholars have long worried about when the ballot box suffices to discipline elected officials to act in their constituents’ interests (Downs 1957, Barro 1973). This paper maintains the centrality of electoral accountability but now with imperfectly informed voters. Voters’ imperfect information has loomed large among the reasons the ballot box may fail as an instrument of political control (Prat 2005, Canes-Wrone, Herron and Shotts 2001, Maskin and Tirole 2004). In this paper, just as in Maskin and Tirole (2004), a voter who is imperfectly informed about the state of the world tries to discriminate between a politician who has interests congruent to the voters’ and one with antithetical preferences. The novelty here is the introduction of a third-party auditor, a maximizing agent outside the voter-politician relationship who may reveal what information the politician had when he acted.

The New York Times’s publication of the Pentagon Papers illustrates how a third-party auditor can affect electoral accountability. In the words of Nixon’s Chief of Staff H.R. Haldeman, the June 13, 1971 publication of the Pentagon Papers was important “because it shows that people do things the President wants to do even though it is wrong, and the President can be wrong.” The publication of the Pentagon Papers led to a wholesale reinterpretation of the actions of the Johnson administration, since they revealed that the increased U.S. involvement under the Gulf of Tonkin resolution actually pre-dated the incident that allegedly spurred it. Johnson did not stand for reelection in 1968, but in voters’ first chance to hold the Democratic Party accountable, the 1972 election, the Republicans won a landside victory. Although the papers originated with a leak from RAND Corporation consultant Daniel Ellsburg, the Times and Neil Sheehan were integral in verifying the documents’ authenticity, placing them in context, and defending their publication.

This paper examines how reporting by third-party auditors can aid in maintaining political control through electoral accountability, when auditors are motivated by three sorts of auditor incentives: the returns to basic informative reports, the returns to blockbuster reports, and the degree of pro-/anti-incumbent bias. Here, auditing can reveal what information a politician had when he took the action under consideration.\footnote{1For an overview of the Times’ role in the publication of the Pentagon Papers, see (Gold 2004), especially Ch. 2. The entirety of the Pentagon Papers were eventually read into the Congressional record by Sen. Mike Gravel. Full text available at http://www.mtholyoke.edu/acad/intrel/pentagon/pent1.html}

\footnote{2In the wake of controversial decisions, the question always arises “what did they know?” Much of the debate over how to interpret the decision to invade Iraq turned on information President Bush had about the presence of weapons of mass destruction (WMDs), both at the time and since. Likewise, scholars wait expectantly for each release of historical information the politician had when he acted.
helps voters maintain high levels of control over elected officials. Intuitively, in an equilibrium where even bad politicians do the right thing, successful investigations almost certainly reveal good news about the incumbent, and they thereby raise his reelection chances. An auditor who benefits from the incumbent’s reelection has an extra reason to put forth investigative effort. Thus, a moderately pro-incumbent auditor requires weaker market incentives to maintain the same level of control. Too much bias is problematic, however, as the auditor fails to disclose damning evidence, causing control to break down.

1.1 Accountability and the News Media

The news media are certainly the auditors that have received the most attention. Information from the media affects voters’ beliefs and voting behavior (DellaVigna and Kaplan 2007, Gerber, Karlan and Bergan 2009, Durante and Knight forthcoming, Snyder and Stromberg 2010). From a political agency point of view, Besley and Prat (2006) explore the way the industrial structure of the media can affect its susceptibility to that capture. They find that a media that is more independent, informed, and commercialized, but less concentrated, leads to better control of intransigent officials. The empirical literature has identified a correlation between more independent media and lower levels of corruption (Leeson 2008, Brunetti and Weder 2003).

The importance of the media, combined with a perception that news outlets provide consistently biased coverage (Groseclose and Milyo 2005, Larcinese, Puglisi and Snyder 2007), led to a large literature on the causes and consequences of media bias. Mullainathan and Shleifer (2005) and Gentzkow and Shapiro (2008) build competing models of endogenous media bias. In both cases, the media shades its reporting in favor its consumers’ biases, but for different reasons. In Mullainathan and Shleifer (2005), consumers enjoy reading news which conforms with their biases, all else equal. In Gentzkow and Shapiro (2008), the media herd. Absent any further information, a report that is consistent with a consumer’s preconceptions signals a high-quality producer. Finally, in Baron (2006), journalists have career concerns which lead them to provide biased reports in order to produce career-enhancing stories. An editor must balance limiting bias to increase demand for the product with allowing bias to pay lower wages to journalists.

A smaller literature explicitly investigates the effects of media bias on political accountability. Records from Presidential libraries to help interpret policymaking within the context of the President’s information at the time. See, for example, a special Summer 2006 issue of Public Historian dedicated to just this topic, especially (Fawcett 2006). A parallel literature looks at the role of media bias in distributional politics. Stromberg (2004) finds that the incentives the media have to target their product to certain groups can slant public policy toward those groups as well.
In an extension of Canes-Wrone et al. (2001), Ashworth and Shotts (2010) show that the media ambiguously affect incumbents’ incentives to pander. Since the media have incentives to look smart, they may herd with a pandering politician, ignoring their information to pander as well. Foreseeing confirmation by the media, politicians have an extra incentive to pander. These findings show that Gentzkow and Shapiro’s (2008) model of media bias can bear fruit in understanding political accountability. There are a number of differences between Ashworth and Shotts (2010) and the model in this paper. Here, auditor bias is an explicit payoff parameter instead of an endogenously arising information outcome, and since the payoff parameter is common knowledge, the voters use it in evaluating the auditor’s report (Chiang and Knight forthcoming). Second, information collection in their model is exogenous, and the journalists are more pundits than auditors; they get a signal and make an educated guess about the state of the world. Here, instead, auditors work endogenously to uncover some or evidence that they then choose to release to the public or withhold. Finally, their journalists are intrinsically motivated to give their best assessment, while here the auditors’ motivations are multifaceted, including a desire to demonstrate their quality by releasing informative reports and a desire to see the incumbent reelected or ousted.

Section 2 introduces the model, defines three equilibria types which are ranked in terms of political control, and establishes the conditions for their existence in a simplified version of the game with exogenous auditing. Section 3 reintroduces strategic auditing and information suppression with explicit auditor incentives and derives the conditions for electoral control as a function of auditor incentives. Section 4 discusses the broader implications of the model and concludes.

2 Model, Equilibria, and The Simplified Game

To understand how third-party auditors can affect political accountability, this section presents a game-theoretic model of policymaking, auditing, and voting with imperfect information. The first subsection presents the general model, the second defines some equilibria of interest to characterize the degree of political control, and the final subsection derives the conditions for the existence of these equilibria in a simplified version of the game.

Bernhardt, Krasa and Polborn (2008) combines a consumer-preference based model of news bias with a two-party model of electoral competition, and shows that political polarization leads to more information loss and electoral mistakes. Since my concern is political agency and control, this paper abstracts from distributional concerns by positing a unitary representative voter.
2.1 Model

The model consists of a two-period game among a representative voter, an auditor, and a politician. I first outline the timing of the game, then the actors’ preferences, and finally the informational structure.

Before the first period, a politician is chosen from an infinite pool of two types, congruent and non-congruent ($t \in \{C, NC\}$), where the proportion of congruent politicians is $\pi_C$. In each period, the state of the world is realized ($S \in \{x, y\}$). This realization is independent across periods, and the ex-ante probability that the state is $x$ is $\theta_x > \frac{1}{2}$. After the state is realized, the politician receives a private signal $s \in \{x, y, \phi\}$. With probability $q$, the signal perfectly reveals the state; otherwise it reveals nothing. I assume $q < \frac{2}{3}$, so the politician is not extremely likely to be informed. This assumption reduces the number of cases to consider, and seems to accord best with the reality of the information environment. Next the politician chooses a publicly-observable action $a \in \{x, y\}$. Represent the action taken by a politician of type $t$ after receiving signal $s$ as $a(s, t)$. After the politician’s action, the auditor decides how much effort to put into investigating, verifying, and certifying the politician’s signal $p(a) \in [0, 1]$. This auditing effort is unobservable. If the politician has received an informative signal, that signal is uncovered and verified by the auditor with probability $p$. If the signal is uncovered, the auditor decides whether to issue a verifiable report $r \in \{s, \phi\}$, where $\phi$ represents no report. If no signal is uncovered, $r = \phi$ automatically. Finally, the voter decides whether to keep the current politician in the next period or to draw a new politician from the population ($v \in \{Keep, Drop\}$) and the game repeats. Where appropriate, for mixed strategies, $a(s, t)$ and $v(a, r)$ also represent the probability of choosing $a = x$ and $v = Keep$.

The politician’s and voter’s per-period payoffs are as follows. The voter receives a positive payoff if the politician’s action matches the state and zero otherwise. The politician’s payoff depends on his type. Both types receive a rent $R > 0$ for holding office, and a congruent politician receives a payoff of 1 if his action matches the state and zero otherwise, while a non-congruent politician receives a payoff of 1 if his action does not match the state and a payoff of zero otherwise. I model non-congruence in this extreme way, consistent with Maskin and Tirole (2004), to maximize the

---

4 The fact that the auditor’s information is hard is important. Consistent with Groseclose and Milyo (2005) and Bernhardt et al. (2008), we assume auditors can selectively withhold information that they uncover, but they cannot fabricate untrue information.

5 The assumption that the new politician is drawn from the same population as the old accords with Maskin and Tirole (2004) but contrasts with Canes-Wrone et al. (2001) and Ashworth and Shotts (2010), who assume the expected quality of the challenger may differ from that of the incumbent, and perform many of their comparisons with respect to this difference. Since I am more interested in the behavior of the auditors, I make the simpler assumption of a common pool.
problem of maintaining control. If it is possible to control this extremely bad type, any intermediate type should also be manageable. Finally, for notational simplicity, let $Z$ represent the value of making a maximizing choice in the first period, relative to expected value to the politician of holding office in the second period. Since the politician directly follows his preferences in the last period, this payoff includes the rents for holding office ($R$), the payoff from being informed ($q \times 1$), and the expected payoff from the best-guess when not informed ($((1 - q) \times \theta_x)$), i.e.,

$$Z = \frac{1}{R + q + (1 - q)\theta_x}.$$ 

I assume that $Z < 1$. Otherwise, there is no hope of maintaining control of the politician, since even getting caught and ousted for sure would not prevent a non-congruent politician from cheating.

The auditor cares about issuing reports, catching lying politicians, the cost of investigating, and whether the incumbent gets reelected. Specifically, an investigation that uncovers and verifies an informative signal with probability $p$ costs the auditor $-p^2/2$. She receives a payoff of $n$ if she reveals that $a = s$, $n + N$ if she reveals that $a \neq s$, and zero if she does not issue a report, where $N, n \geq 0$. $n$ measures the incentives to produce basic informative news stories. This return could come explicitly from the market for the news itself, since even the verification of the signal reveals some (potentially valuable) information. The return could also come from a career-concerns model in which the auditor’s success in uncovering and verifying a signal reveals something valuable about her talent as an investigator. $N$ is the premium to uncovering a blockbuster story. That information is quite valuable to the voter, since, in equilibrium, it always signals a non-congruent politician. Furthermore, uncovering cheating by the politician may be an even better signal of the auditor’s acumen. Finally, if an incumbent is reelected, the auditor receives a payoff of $b$, which can be positive or negative. This $b$ measures the degree of pro-incumbent bias. This payoff may be strictly ideological, relate to unmodeled policy differences between the candidates, a political connection to the incumbent or opposition, or represent the costs of cultivating new sources with a new administration in charge.

Finally, there are two types of belief to specify: the voter’s beliefs about the politician’s type and the auditor’s beliefs about the signal the politician received. Let $\pi_C^*(a, r)$ represent the voter’s belief that the politician is congruent, after observing action $a$ and report $r$. Let $\chi_s(a)$ represent the auditor’s belief that the politician’s signal was $s$, given action $a$.

\[\text{We will see that there are some equilibria in which politicians pool, and there is no information ever revealed about the politician’s type. Why anyone bothers to write or read about this political decision in the first place is less clear. I simply assume that there is some level of interest in any news story on this important political decision, and $n$ represents the extra reward for a story with a verifiable report in it since it signals an effective auditor.}\]
2.2 Equilibria

My goal here is not to characterize all the equilibria that could arise. Instead, I want to determine whether third-party auditing, together with the power of the ballot box, can discipline recalcitrant politicians to act in the citizen’s best interests. I focus on “possibility” theorems concerning the existence of equilibria with the most complete sorts of political control. Without some equilibrium selection criteria, no auditing conditions guarantee performance by the non-congruent politicians.

If we focus on equilibria in which the congruent types always do the right thing, however, it is relatively straightforward to characterize the degree of control over the non-congruent.

The following three Perfect Bayesian Equilibria (PBE) are ranked in terms of how closely the non-congruent politicians’ first-period actions align with those preferred by the voter. They all have the attractive feature that the congruent politician acts as the citizen would, by following his signal if he receives one and otherwise choosing $x$. They differ only with respect to how much control the citizens maintain over the non-congruent types.

**Definition 1** A full-control equilibrium is a PBE in which both types of politician always follow their informative signals and congruent politicians choose action $x$ after receiving no signal ($(a(s, t) = s$ for $s \in \{x, y\}$ and $t \in \{C, NC\}$, and $a(\phi, C) = x$).

**Definition 2** A pandering equilibrium is a PBE in which congruent politicians always follow their informative signal if they receive one and otherwise choose action $x$, while non-congruent politicians take action $x$ after any informative signal ($a(s, C) = s$ and $a(s, NC) = x$ for $s \in \{x, y\}$, and $a(\phi, C) = x$).

**Definition 3** A no-control equilibrium is a PBE in which congruent politicians always follow their informative signal if they receive one and otherwise choose action $x$, while non-congruent politicians take action $x$ with positive probability after signal $y$ and take action $y$ with positive probability after signal $x$ ($a(s, C) = s$ for $s \in \{x, y\}$, $a(y, NC) > 0$, $a(x, NC) < 1$, and $a(\phi, C) = x$).

---

7The Intuitive Criterion, for example, would clearly limit things some. Politicians always choosing $y$ and voters always keeping politicians who choose $y$ and dropping those who choose $x$ would be an equilibrium, sustained by out-of-equilibrium beliefs that those who choose $x$ are non-congruent, regardless of the results of the audits. But these beliefs fail the Intuitive Criterion, since if a politician chooses $x$ and the audit reveals that his signal was $x$, that choice is equilibrium-dominated for the non-congruent types.
2.3 Simplified Game with Exogenous Auditing

Consider first a simplified game in which the auditor is not a strategic player. By putting the auditor in the background temporarily, we can highlight how the election game itself functions. This separation clearly delineates the equilibrium features that arise from the politician-voter strategic interactions from those with their origins in the strategic play of the auditor.

Assume for this section that the probability of an informative signal being revealed after the politician takes action \( a \) is fixed and exogenously given by \( p(a) \). So for signal \( s \) and action \( a \), the report is

\[
r(a, s) = \begin{cases} 
  s & \text{with probability } p(a) \\
  \phi & \text{with probability } 1 - p(a).
\end{cases}
\]

Note that \( r(a, \phi) = \phi \) with probability 1, since an auditor cannot reveal a signal if the politician did not receive one. To summarize the politician's and voter's payoffs in this simplified game,

\[
EU_P(a | s, t, v) = \begin{cases} 
  1(t = NC) + (-1)^{1(t=NC)} \text{Prob}(a = S|s) + \\
  \frac{1}{Z} \sum_r \{v(a, r) \text{Prob}(r|a, s)\}
\end{cases}
\]

\[
EU_V(v|a, r) = \text{Prob}(a = S|a, r) + \\
(1 - q)(1 - \theta_x) + [v\pi^*_C(a, r) + (1 - v)\pi_C][(2\theta_x - 1) + 2q(1 - \theta_x)].
\]

The first line of each utility function is the expected payoff in the first period, while the second is the expected payoff in the second period. The politician’s payoff in the first period includes his payoff for (not) matching his action to the state if he is (not) congruent. His expected second-period payoff depends on the probability of reelection, given his action, and the expected payoff if he is elected, defined above \((1/Z)\). The citizen’s payoff in the first period depends on the probability that the politician matches his action to the state, and his second-period payoff depends on the probability that the second-period politician will be congruent. The citizen chooses between reelecting the current politician (who is congruent with probability \( \pi^*_C \)) and taking a new draw (who is congruent with probability \( \pi_C \)).

A PBE consists of a signal- and type-dependent mixed strategy for the politician \( a^*(s, t) \), an action- and report-dependent mixed-strategy by the citizen \( v^*(a, r) \), and action- and report-dependent beliefs by the citizen \( \pi^*_C(a, r) \), such that:

1. \( EU_P(a^*(s, t)|s, t, v^*) \geq EU_P(a|s, t, v^*) \) for all \((a, s, t)\)
2. $EU_V(v^*(a, r)|a, r) \geq EU_V(v|a, r)$ for all $(v, a, r)$

3. $\pi_C^*(a, r)$ is consistent with Bayes’ Rule

The existence of the full-control, pandering, and no-control equilibria depends directly on the exogenous auditing probabilities.

**Lemma 1** For any $(p(x), p(y))$ pair, a PBE exists in which the congruent politician follows his informative signal and takes action $x$ in the absence of a signal.

1. If the following two conditions hold, every such PBE is a full-control equilibrium:
   
   (a) $p(x) + p(y) > 2Z$
   
   (b) $\max\{p(x), p(y)\} > Z[1 + (1 - \min\{p(x), p(y)\})(2\theta_x - 1)]$.

   Furthermore, there exists a full-control equilibrium in which the non-congruent types choose $x$ after no signal.

2. If the following two conditions hold, every such PBE is a pandering equilibrium:
   
   (a) $\min\{p(x), p(y)\} > \frac{2Z(1-\theta)}{1-Z+2Z(1-\theta)}$
   
   (b) $\max\{p(x), p(y)\} < Z[1 + (1 - \min\{p(x), p(y)\})(2\theta_x - 1)]$.

   Furthermore, the non-congruent types chooses $x$ after no signal with probability

   $$a(\phi, NC) = 1 - \frac{q}{1 - q}(1 - \theta)\left(1 - \min\{p(x), p(y)\}\right).$$

3. Otherwise, every equilibrium is a no-control equilibrium in which the non-congruent types choose $x$ after no signal and after signal $y$. After signal $x$, they choose $x$ with probability

   $$a(x, NC) = 2 - \frac{1}{\theta}.$$

The full proof for the Lemma is given in the Appendix, but here I discuss the conditions for the existence of the described full-control equilibrium to illustrate the structure of the voter-politician game. If the congruent type wants to deviate from equilibrium, so does the non-congruent type,
and so it suffices to check the non-congruent type’s three IC constraints. The equilibrium strategy of choosing \( x \) needs to be optimal after a signal of \( x \), i.e.,

\[
[p(x)v(x, x) + (1 - p(x))v(x, \phi)][\frac{1}{Z}] \geq 1 + [p(y)v(y, x) + (1 - p(y))v(y, \phi)][\frac{1}{Z}].
\]

Similarly, after the signal \( y \),

\[
[p(y)v(y, y) + (1 - p(y))v(y, \phi)][\frac{1}{Z}] \geq 1 + [p(x)v(x, y) + (1 - p(x))v(x, \phi)][\frac{1}{Z}].
\]

Finally, in the absence of a signal, the non-congruent type should prefer to choose \( x \), so

\[
(1 - \theta_x) + v(x, \phi)[\frac{1}{Z}] \geq \theta_x + v(y, \phi)[\frac{1}{Z}].
\]

Since the equilibrium is completely uninformative about the politician’s type, any voting strategies are consistent with optimization by the voter. Setting \( v(x, x) = v(y, y) = 1 \) and \( v(x, y) = v(y, x) = 0 \), reelecting for sure after good news and removal for sure after bad news, only slackens the IC constraints. Making those substitutions results in three inequalities in \( v(x, \phi) \) and \( v(y, \phi) \). The simplified IC constraints after signal \( x \), \( y \), and no signal, respectively, are given by

\[
\begin{align*}
 p(x) + (1 - p(x))v(x, \phi) - (1 - p(y))v(y, \phi) & \geq Z \\
 p(y) - (1 - p(x))v(x, \phi) + (1 - p(y))v(y, \phi) & \geq Z \\
 v(x, \phi) - v(y, \phi) & \geq (2\theta_x - 1)Z
\end{align*}
\]

It follows immediately from the sum of (1) and (2) that a full-control equilibrium requires \( p(x) + p(y) \geq 2Z \). If there were no restrictions on \( v(x, \phi) \) and \( v(y, \phi) \), this derived condition would be sufficient to satisfy both constraints. By raising the reelection probability after action \( x \) and no report \((v(x, \phi))\) or lowering it after action \( y \) and no report \((v(y, \phi))\) the voter improves the politician’s incentives to choose \( x \) after signal \( x \) and worsens his incentives to choose \( y \) after signal \( y \). Moving the voting probabilities in the opposite direction shifts incentives the other way. As long as \( p(x) + p(y) \geq 2Z \) there are sufficient re-election incentives available to satisfy both (1) and (2).

In fact, the uninformed reelection probabilities are constrained in two ways. First, they must be between 0 and 1, and, second, uninformed reelection rates after action \( x \) must be sufficiently above uninformed reelection rates after action \( y \) to satisfy (3). Setting \( v(x, \phi) = 1 \) and \( v(y, \phi) = 0 \) satisfies (1) and (3). If we can also find a \( v(x, \phi), v(y, \phi) \) combination that simultaneously satisfies
and (3) then some voting combination between the two will satisfy all three constraints. Starting from \( v(x, \phi) = 1 \) and \( v(y, \phi) = 0 \) there are two ways to slacken (2), lower \( v(x, \phi) \) or raise \( v(y, \phi) \). Lowering \( v(x, \phi) \) by one unit loosens (2) by \((1 - p(x))\), since this uninformed reelection probability only matters when no report is released after action \( x \). Raising \( v(y, \phi) \) by one unit loosens it by \((1 - p(y))\) units, for the same reason. The first strategy is more effective at loosening the IC-constraint when \( p(x) < p(y) \) and vice-versa– it is more effective to adjust the uninformed reelection probability in the state in which the voter is least likely to be informed.

The following Lemma formalizes these equilibrium reelection strategies, which extend beyond the full-control case, and will be useful in discussing the import and intuition behind Lemma 1.

**Lemma 2** In any PBE in the simplified game in which the congruent politician follows his informative signal and takes action \( x \) in the absence of a signal,

1. when \( p(y) > p(x) \), the voter’s equilibrium reelection strategy in the absence of a signal is \( v(x, \phi) \geq Z(2\theta_x - 1) \) and \( v(y, \phi) = 0 \);

2. when \( p(x) > p(y) \), the voter’s equilibrium reelection strategy in the absence of a signal is \( v(x, \phi) = 1 \) and \( v(y, \phi) \leq 1 - Z(2\theta_x - 1) \).

In addition to the obvious points that a larger shadow of the future (smaller \( Z \)) and more auditing (greater \( p(x) \) or \( p(y) \)) improves accountability, Lemma 1 establishes the non-obvious result that asymmetric auditing is better for maintaining full-control but worse for maintaining partial control. For any level of total auditing \((p(x) + p(y))\), an allocation of auditing probabilities support a full-control equilibrium only if any more asymmetric allocation also supports it. By contrast, an allocation of auditing probabilities supports a pandering equilibrium only if any more symmetric allocation also supports it. To highlight this fact, Figure 1 illustrates the auditing probabilities which lead to each type of equilibrium.

The intuition for the asymmetric result for full-control turns on the voting strategies used by the citizen in the absence of a report. Once overall auditing probabilities are big enough \((p(x) + p(y) \geq 2Z)\), the difficulty in maintaining full control is getting the non-congruent type to comply when the unlikely state \((y)\) occurs. So how should the voter set his uninformed election probabilities?

When \( p(y) > p(x) \), a politician is more likely to face an uninformed voter after action \( x \) than after action \( y \), so high uninformed reelection probabilities diminish the politician’s incentives to choose action \( y \), relative to action \( x \). An anti-incumbent reelection strategy has the best chance of maintaining control. If \( p(y) >> p(x) \) this strategy is quite effective, since the politician knows
there is a good chance at reelection from taking the correct action and a poor chance at reelection from choosing the wrong action, even if there is no negative report issued.

When \( p(x) > p(y) \), a politician is more likely to face an uninformed voter after action \( y \) than after action \( x \), so high uninformed reelection probabilities increase the politician’s incentives to choose action \( y \), relative to action \( x \). Here, a pro-incumbent strategy has the best chance of maintaining control. If \( p(x) \gg p(y) \), this strategy is quite effective, since the politician is likely reelected with or without a report after choosing \( y \), but has a very low probability of avoiding a bad report after choosing \( x \).

The problem occurs when \( p(y) \approx p(x) \approx Z \). In this case, neither reelection strategy is particularly effective. An anti-incumbent strategy does not work well because \( p(y) \) is too low to make the politician confident that he will be reelected after making the right choice. A pro-incumbent strategy does not work well either, because \( p(x) \) is too low to make the politician sufficiently worried about getting caught if he chooses the wrong action. Since neither strategy is particularly effective,
the overall level of auditing needs to be higher.

For the pandering equilibrium, the intuition is a bit different, since the equilibrium is somewhat informative about the politician’s type. When \( p(y) > p(x) \), the voter is indifferent after \( x \) and no report, but strictly prefers replace the incumbent after \( y \) and no report. Replacing for these reelection probabilities in (1) gives a lower bound for \( p(x) \). Informally, the probability of being rewarded with reelection after doing the right thing needs to be high enough to keep the congruent type choosing action \( x \), given that he would never get away with cheating after action \( y \). When \( p(x) > p(y) \), the voter is indifferent after \( y \) and no report but strictly prefers to reelect the incumbent after \( x \) and no report. Replacing for these reelection probabilities in (1) gives a lower bound for \( p(y) \). Informally, the probability of being punished with removal after cheating by taking action \( y \) needs to be high enough to keep the congruent type choosing action \( x \), given that he will always be reelected if he does so. Taken together, the lower of the two auditing probabilities must be above some threshold to maintain partial control in the pandering equilibrium.

2.4 Voter Welfare

I measure welfare by the expected utility of the voter. Since the congruent act the same way in all the equilibria of interest, the differences in the voter’s welfare depend on the actions of the non-congruent types alone. The voter’s payoff can be usefully separated into two parts, the probability that the incumbent matches his action to the state in the first period and the probability that whichever politician is in office does so next period. Given the results of Lemma 1, it is easy to calculate the first part. For the second part, let \( U_C = q + (1 - q)\theta_x \) represent the voter’s expected utility from having a congruent politician in the second period and \( U_{NC} = (1 - q)(1 - \theta_x) \) represent the voter’s expected utility from having a non-congruent politician. Given beliefs \( \pi \), the voter’s expected second-period utility is \( U_2^V(\pi) = \pi U_C + (1 - \pi)U_{NC} \).

In the pandering and no-control equilibria, the citizen loses some control in the first period, but may gain some useful information about the incumbent that improves his payoff in the second. In particular, the valuable information is any evidence that the incumbent is more likely to be congruent than a random draw from the population.

The following remark summarizes these payoffs, where the first line is the expected payoff in the first period and the second line is the expected payoff in the second.

Remark 1 *The voter’s expected payoff in the simplified game in a*
• full-control equilibrium is

$$\pi_C U_C + (1 - \pi_C)[\theta x + q(1 - \theta x)]$$

$$+ U_x^Y (\pi_C) + 0$$

• pandering equilibrium is

$$\pi_C U_C + (1 - \pi_C)[\theta x - q(1 - \theta x)(2\theta x - 1)(1 - \min\{p(x), p(y)\})]$$

$$+ U_x^Y (\pi_C) + q\pi C(1 - \pi C)(1 - \theta x)\left[q + (1 - q)(2\theta x - 1)\right]p(y)$$

• no-control equilibrium is

$$\pi C U C + (1 - \pi C)[\theta x - q(1 - \theta x)]$$

$$+ U_x^Y (\pi C) + q\pi C(1 - \pi C)(1 - \theta x)\left[q + (1 - q)(2\theta x - 1)\right](p(x) + p(y))$$

There are four things to note in these expressions. First, the voter’s expected payoff is always higher in the equilibria with better control, so these equilibria are strictly ordered from a welfare perspective. Second, the voter’s expected payoff is the same in any full-control equilibrium, independent of the auditing probabilities. Any additional auditing has no effect on the politician’s actions and can reveal no information about his type. Third, welfare in the pandering equilibrium is increasing in $p(y)$ and in the minimum auditing probability. It increases in $p(y)$, because good news after action $y$ reveals for certain that the politician is congruent. It increases in the minimum auditing probability because the non-congruent put greater weight on action $x$ in the absence of a signal as this probability increases. Higher $p(x)$ does not help, directly, because both types choose action $x$ after signal $x$, so evidence that the incumbent has done so reveals nothing about his type. Finally, welfare in the no-control equilibrium is increasing in both auditing probabilities. This is entirely a screening effect, since the politicians’ actions in a no-control equilibrium are independent of the auditing probabilities. Evidence that the politician has followed his signal after either action is good news about his type, allowing the citizen to keep an promising incumbent.
3 Endogenous Reporting

Reintroducing the maximizing auditor adds two complications. First, sufficiently biased auditors may strategically conceal information. Second, the level of auditing effort depends on the auditor’s incentives. In the next subsection, I calculate the auditor’s suppression and effort choices. Subsection 3.2 brings the auditor’s efforts together with Lemma 1 to characterize the equilibria with no suppression in equilibrium, and the final subsection briefly explores equilibrium suppression.

3.1 Information Suppression and Auditor Effort

The auditor’s decision to withhold information can work either for or against the incumbent. A pro-incumbent auditor may withhold information that the politician acted contrary to his signal if the drop in the incumbent’s reelection chances from a bad report is large, relative to the market rewards for a report demonstrating political misconduct. An anti-incumbent auditor may withhold information good information for similar reasons. At every level of control, a report that the politician followed his signal guarantees reelection, and a report that he failed to follow his signal guarantees removal (Lemma 2). Absent a report, he is reelected with some (action-dependent) probability, \(v(a, \phi)\). An auditor reveals that the politician followed his signal if

\[
n + b(1 - v(a, \phi)) \geq 0
\]

and reveals that the politician failed to follow his signal if

\[
n + N - bv(a, \phi) \geq 0.
\]

The decision to withhold good news plays very little role in equilibrium, since an auditor who is unwilling to disclose good news is also unwilling to work very hard to uncover it. In a full-control equilibrium, for example, any reporter who would suppress good news puts in no auditing effort in the first place. The decision to suppress bad news, by contrast, can be quite important. If an auditor is so pro-incumbent that she cannot be trusted to reveal bad news, the voters will alter their reelection strategies. The voter “discounts” empty reports from biased sources as containing a mix of no discoveries and bad news that has been suppressed (Chiang and Knight forthcoming). Reports are still useful. The difference between good reports and neutral reports can discipline the politician, but it becomes more difficult to maintain high levels of electoral accountability.
Lemma 3 outlines how auditing probabilities translate to political control when auditors suppress bad information. Figure 2 illustrates these cutoffs graphically.

**Lemma 3** Take a combination of auditing probabilities \((p(x), p(y))\). If \(b > \frac{n+N}{Z(2\theta_x-1)}\), a PBE exists in which the congruent politician follows his informative signal and takes action \(x\) in the absence of a signal. In any such equilibrium, \(v(y, \phi) = 0\) and any bad news uncovered after action \(x\) is suppressed.

1. **If the following condition holds, every such PBE is a full-control equilibrium:**

   \[p(y) > \max\{2Z\theta, 2Z - \frac{p(x)}{1-p(x)}(1-Z)\}\]

   Furthermore, the non-congruent types choose \(x\) after no signal.

2. **If the following conditions hold, every such PBE is a pandering equilibrium:**

   \[p(x) > \frac{2Z(1-\theta_x)}{1-Z + 2Z(1-\theta_x)} \text{ and } p(y) < 2Z\theta_x\]

   Furthermore, the non-congruent types choose \(x\) after no signal with probability

   \[a(\phi, NC) = 1 - \frac{q}{1-q} (1-\theta_x)\]

3. **Otherwise, every such PBE is a no-control equilibrium.**

Information suppression is not unambiguously bad for the voter. When \(p(x)\) is large but \(p(y)\) is small, the equilibrium payoff for the voter is higher under information suppression than in an equilibrium with a set of auditor incentives that lead to the same auditing probability but for which all reports are revealed. For these probabilities, a pandering equilibrium exists with information suppression, but the voter loses all control without suppression. The key intuition is twofold. First, suppression after action \(x\) makes it difficult to keep the politician choosing \(y\) after signal \(y\), but in a pandering equilibrium the voter has already lost that sort of control. Second, according to Lemma 2 when \(p(x) > p(y)\) and all bad news is released, the voter pursues a pro-incumbent reelection strategy in equilibrium. Given this strategy, \(p(y)\) needs to be high enough for the non-congruent to expect detection while choosing action \(y\) after signal \(x\). When information suppression occurs, the voter always pursues an anti-incumbent reelection strategy that includes \(v(y, \phi) = 0\), so the
non-congruent type can never “get away” with choosing action $y$ after receiving signal $x$. In all other cases, information suppression weakly reduces the voter’s welfare.

**Auditor Effort**  The auditor must decide how much effort to put in, taking into account her expectations about the politician’s signal and her plans to release or withhold whatever information she uncovers. Given action $a$ by the politician, and Bayesian updated beliefs $\chi_a(a)$ that the politician’s signal was $a$ given action $a$ and $\chi_{-a}(a)$ that the politician had the opposite informative signal, the auditor chooses $p(a)$ to solve the problem

$$\max_{p\in[0,1]} \left\{ p[\chi_a(a)\max\{0, n + b(1 - v(a, \phi))\}] + \chi_{-a}(a)\max\{0, n + N - bv(a, \phi)\} - p^2/2 \right\}$$  \hspace{1cm} (6)$$

Together with the auditing requirements from Lemmas 1 and 3, we can use the solution to this problem to characterize the level of equilibrium control as a function of the auditor incentive
3.2 Equilibria With No Suppression

In this subsection, I investigate equilibria with no information suppression. Note, information revelation is not being exogenously imposed, but rather I require that the no-suppression constraint derived above is satisfied in equilibrium. As outlined in the previous section, the voter may be able to maintain some level of control despite information suppression. I return to that issue in the final subsection.

**Full Control** Bayesian updating in a full-control equilibrium outlined in Lemma 1 requires the auditor to never expect the politician to have acted contrary to his signal:

\[ \chi_x(y) = 0 \quad \chi_y(x) = 0. \]

Action \( y \) should only occur after an informative signal while action \( x \) can occur with or without an informative signal:

\[ \chi_x(x) = \frac{q \theta_x}{q \theta_x + (1 - q)} \quad \chi_y(y) = 1. \]

Absent suppression, the auditor’s maximizing auditing efforts follow from (6):

\[ p(y) = n + b(1 - v(y, \phi)) \]
\[ p(x) = \frac{q \theta_x}{q \theta_x + 1 - q}[n + b(1 - v(x, \phi))]. \]

Auditor effort is increasing in returns to basic news (\( n \)) and the degree of pro-incumbent bias (\( b \)). In equilibrium, no bad news is ever uncovered, so neither the reluctance of pro-incumbent auditors to release bad news nor the return to blockbuster reports (\( N \)) plays any role in determining auditing effort. Once full control has been achieved, voter welfare is independent of auditor incentives (Remark 1).

Unless the auditor is extremely anti-incumbent and the returns to basic reports are very large, a full-control equilibrium entails \( p(y) > p(x) \), above the 45-degree line in Figure 1. The auditor works harder after action \( y \) for two reasons. First, action \( y \) signals the presence of an informative signal, while action \( x \) could indicate either an informative signal of \( x \) or no informative signal. Only
informative signals can lead to informative reports, and the market rewards informative reports, so all auditors will work harder when an informative signal is more likely. For pro-incumbent auditors, there is a second reason to work harder after action $y$ than after $x$. The incumbent’s reelection probability after action $x$ and no signal is always higher than his reelection probability after action $y$ and no signal, so good news after action $y$ increases the reelection probability more than good news after action $x$.

Pro-incumbent auditors might be advantageous in maintaining a full-control equilibrium for two reasons. They audit more aggressively, and they do so more asymmetrically (auditing more after action $y$ than after action $x$).

**Pandering** Bayesian updating by auditors in a pandering equilibrium outlined in Lemma 1 implies that auditors never expect to find bad news after action $y$ but sometimes will after action $x$:

$$\chi_y(y) = 0, \quad \chi_y(x) = \frac{(1 - \pi_C)(1 - \theta_x)}{\theta_x + (1 - \pi_C)(1 - \theta_x) \min\{p(x), p(y)\} + \frac{(1-q)}{q}}. $$

It also means that either action could be more likely to indicate a politician following an informative signal, depending on the fraction of congruent types:

$$\chi_y(y) = \frac{\pi_C}{1 - (1 - \pi_C) \min\{p(x), p(y)\}} \quad \chi_x(x) = \frac{\theta_x}{\theta_x + (1 - \pi_C)(1 - \theta_x) \min\{p(x), p(y)\} + \frac{(1-q)}{q}}. $$

Given these beliefs, the auditor’s maximizing auditing efforts follow from (6):

$$p(y) = \frac{\pi_C[n + b(1 - v(y, \phi))]}{1 - (1 - \pi_C) \min\{p(x), p(y)\}},$$

$$p(x) = \frac{\theta_x[n + b(1 - v(x, \phi))]}{\theta_x + (1 - \pi_C)(1 - \theta_x) \min\{p(x), p(y)\} + \frac{(1-q)}{q}}.$$

Both auditing probabilities increase in the returns to basic audit reports ($n$). $p(x)$ also increases in the return to blockbuster reports ($N$). $p(y)$ increases in the degree of pro-incumbent bias ($b$). $p(x)$ increases in bias while $p(y) > p(x)$ and decreases in bias while $p(x) > p(y)$, due to the voting strategies outlined in Lemma 2. Briefly, when $p(y) > p(x)$ the voter uses an anti-incumbent voting strategy, so the probability of reelection falls only slightly when bad news is revealed and it increases significantly when good news is revealed. Taken together, this means a pro-incumbent auditor wants to work hard. Of course when $p(x) > p(y)$, the voter uses a pro-incumbent strategy
and the incentives are exactly reversed. But since only the minimum auditing probability matters for maintaining a pandering equilibrium, increasing bias always helps. Within pandering equilibria, voter welfare is strictly increasing in both $n$ and $b$, but only weakly increasing in $N$ (strict if $p(x) < p(y)$).

Finally, within no-control equilibria without suppression, a similar analysis ties the auditing probabilities to the underlying incentive parameters. Voter welfare is unambiguously increasing in $n$ and $N$. The effect of bias is ambiguous. If $p(y) > p(x)$, the voter pursues an anti-incumbent re-election strategy, so $p(y)$ increases in $b$ more than $p(x)$ declines. Since welfare depends on the sum of $p(x)$ and $p(y)$, it increases in $b$. If $p(x) > p(y)$, the total level of auditing could either increase or decrease in $b$, depending on the number of non-congruent types. If there are many non-congruent politicians, the voter’s welfare is decreasing in $b$, and vice-versa.

**No-Suppression Constraint** For both full-control and pandering equilibria, increasing pro-incumbent bias increases the auditor effort that matters. Taken alone, this fact suggests that more pro-incumbent auditors are better for maintaining control of the incumbent. That intuition would be unambiguously correct if the auditor had no discretion in releasing the information she uncovers. In fact, a pro-incumbent auditor reveals evidence of the incumbent taking action $x$ after signal $y$ as long as $n \geq bv(x, \phi) - N$.

This no-suppression constraint limits the value of pro-incumbent auditors. Starting from an anti-incumbent auditor, an increasingly pro-incumbent auditor makes it easier to maintain a given level of control, in the sense that weaker and weaker market-based incentives ($n$) are necessary as bias grows. That decline continues until the auditor’s constraint to reveal bad news binds. Further increases in bias make it more difficult to maintain the same level of control, because larger market incentives are required to avoid information suppression. The degree of bias at which this transition occurs depends directly on the market returns to the revelation of bad news ($N$), since it influences the auditor’s willingness to withhold information. Proposition 1 formalizes these intuitions, which are further illustrated in Figure 3.

**Proposition 1** For each $(b, N)$ combination, there are two threshold payoffs to informative reports, $0 \leq \bar{n} \leq \overline{n} < \infty$ such that a full-control equilibrium with no information suppression exists if and only if $n \geq \overline{n}$, and a pandering equilibrium with no information suppression exists if and

---

8Details available from author.
9If this constraint is satisfied, she will always be willing to reveal action $y$ after signal $x$, since $v(x, \phi) > v(y, \phi)$ in both types of equilibria.
only if $\bar{\pi} > n \geq n$. Furthermore,

1. There exist unique bias cutoffs $0 < \underline{b} \leq \bar{b}$, such that $n$ decreases in $b$ for $b < \underline{b}$ and increases in $b$ for $b > \underline{b}$. Similarly, $\bar{\pi}$ decreases in $b$ for $b < \bar{b}$ and increases for $b > \bar{b}$.

2. $\underline{b}$ and $\bar{b}$ increase in $N$, while $n$ decreases in $N$.

3. $\bar{\pi}$ is constant in $N$ for $b \leq \underline{b}$ but decreases in $N$ for $\bar{b} < b$.

There are three key results from Proposition 1. First, some level of basic news always suffices to induce a full-control equilibrium. As long as the full value of holding office tomorrow is at least as big as the value of choosing policy today ($Z < 1$), a non-congruent politician who is certain to be caught for cheating chooses to act correctly. If $n$ is arbitrarily large, $p(x) = p(y) = 1$, no suppression will occur, and all politicians will follow their informative signals.

Second, a small degree of pro-incumbent bias is useful in maintaining either level of control, while anti-incumbent bias makes it more difficult, but too much pro-incumbent bias is problematic. Consider a completely unbiased auditor. Such an auditor puts forth effort in order to reap the returns from producing informative reports. If she becomes slightly anti-incumbent, an informative report becomes less valuable, since it also leads to an increase in the incumbent’s reelection probability. Similarly, a slightly pro-incumbent auditor finds informative reports more valuable. As long as the bias is small, relative to the returns to blockbuster reports, the reelection motive is not sufficient to convince the auditor to hide bad news.

Finally, the return to blockbuster stories is not directly useful in maintaining a full-control equilibrium, since all politicians follow their signals in equilibrium. But increasing this return can be indirectly useful because more pro-incumbent auditors become willing to reveal bad news, off the equilibrium path. The additional return to blockbuster stories is directly useful in maintaining pandering equilibria, since some cheating occurs.

Figure 3 illustrates these three effects for the case of no blockbuster returns ($N = 0$) and the case of some positive blockbuster return. The return to basic news is represented on the vertical axis and the bias parameter is on the horizontal axis. The labels indicate the regions of the $(b, n)$ space for which each level of control is achieved and all information is released, as well as the region in which the auditor suppresses bad news. The values of the bias parameter that make each level of control easiest to achieve, $\underline{b}$ and $\bar{b}$ from Proposition 1, are labeled on the bias axis. Note, in particular, that these key bias cut-offs are positive and that they move up as $N$ increases.
3.3 Equilibria with Suppression

Even if the auditor is not willing to reveal wrongdoing, it may nevertheless be possible to maintain some level of control (Lemma 3). For full-control equilibria, the requirements are quite strict. The non-congruent politician’s IC constraint after signal $y$ becomes much harder to satisfy, since choosing $x$ gets him reelected with probability $v(x, \phi) > 0$, whether or not the auditor uncovers his signal. The IC constraint (2) becomes

$$p(y) + (1 - p(y))v(y, \phi) - v(x, \phi) \geq Z,$$

while the IC constraints after signal $x$ and no signal (1) and (3) remain unaffected.

In order to still maintain full control, the probability that a politician who follows his signal will be re-elected needs to be substantially higher. Intuitively, the “best” a captured auditor can do for the politician is withhold bad information, which leads to reelection with some small probability, but if the auditing probabilities are very high, following the signal nearly guarantees reelection. If reelection is important enough, this guarantee suffices. As $b$ and $n$ increase, the level of auditing effort may reach the point where it is possible to maintain full control with suppression. From this point onward, it again becomes easier to maintain a full-control equilibrium as the auditor becomes more biased. Once suppression is a forgone conclusion, any further bias has only the (positive)
In contrast, pandering equilibria are very robust to suppression. When the auditor suppresses bad news, both auditing probabilities increase in the returns to basic news ($n$). Both also increase in pro-incumbent bias ($b$), since auditing after either action could result in uncovering good news, and any bad news will be suppressed. The return to blockbuster reports ($N$) ceases to affect auditing effort, since bad news is not reported. Since the domain of auditing probabilities that support a pandering equilibrium only expands when information is suppressed, a pro-incumbent auditor is unambiguously helpful in maintaining a pandering equilibrium.

Figure 4 represents the range of parameters in the $(b, n)$ space for which each type of equilibrium arises, for a given $N > 0$. It extends the representation in panel (b) of Figure 3 by including the situations in which the no-suppression constraint fails.

---

10 This analysis is all about what would occur on a part of the game tree that is never reached in a full-control equilibrium. The failure of the no-suppression constraints simply means that the politician could get away with ignoring his signal if he tried. In a full-control equilibrium, he will never actually try.
4 Implications and Conclusions

The effect of biased auditors on the voters’ control of potentially recalcitrant politicians is complex. On the one hand, biased auditors may suppress information which could be useful for policing the politician. Foreseeing this suppression, politicians may take liberties. Voters respond by altering their reelection strategies, but the loss of information hampers their efforts. On the other hand, pro-incumbent auditors are willing to work harder than unbiased auditors to uncover and verify information that improves the incumbent’s reelection possibilities.

Which of these two effects is more important depends on the strength of the auditor’s other incentives. When the market incentives to deliver informative reports are strong, the beneficial effects of pro-incumbent bias dominate. For weak market incentives, however, information suppression occurs and the ability to maintain full control of the politician can break down. When the market incentives for informative reports are insufficient to maintain perfect control, but an intermediate level of control is possible, the beneficial effects of bias unambiguously dominate. Finally, when the market incentives for informative reports are very small, so very little control of the politician is possible, pro-inc incumbency bias is the most problematic. It may both reduce effort and undermine information revelation.

Increasing competition may weaken the effects of bias. In this paper, a pro-incumbent auditor knows that if she suppresses information about the incumbent, that information will never see the light of day. In a model with multiple auditors, where some of the auditors are not so pro-incumbent as to suppress information, a very pro-incumbent auditor needs to worry that if she suppresses information some other auditor will release it. If this happens, she gets the worst outcome—the bad information will lead to the incumbent losing office and the auditor will receive the worst market-based payoff. As the level of competition increases, greater bias would be required to induce suppression. By a very similar argument, the effort effect of pro-incumbent bias is also diminished by increased competition. If a pro-incumbent auditor thinks some competitor will reveal the good news about the incumbent, he has little extra incentive to find good news herself.

The contingent effects of bias suggest that care should be taken in offering general policy prescriptions without attention to the economic environment in which the auditors act. Some recent research suggests, for example, that the media become more independent from political actors and less biased as advertising revenues, and presumably the returns to effective reporting, increase (Hamilton 2004, Gentzkow, Glaeser and Goldin 2006, Petrova 2010). The analysis in this paper suggests a second effect, whereby bias becomes less worrying and maybe even useful.
as the market returns to informative reports increase. So some policy which insulates the media from pro-incumbent pressure may be quite useful in an economic environment where there are low returns to informative reports, as say in an underdeveloped media market, but that same policy would be misguided in a more robust media market. Similarly, a policy which encouraged media competition may be quite useful if the incumbent media is so biased that they consistently suppress bad information, but may undermine the beneficial effect of a mildly pro-incumbent auditor.

This paper has focused on the media as the exemplar of a third-party auditor in the political domain, but other sorts of auditors may also participate in this market and are worth a brief discussion. Partisan operatives, either pro- or anti-incumbent, could easily be represented in this model, as long as they had the ability to find verifiable evidence of the incumbent’s signal. If these operatives merely cared about reelection, they would have $n = N = 0$, and large (positive or negative) $b$. Opposition operatives would never be directly useful in maintaining a full-control or pandering equilibrium, but they could be indirectly useful by providing competitive pressure on a pro-incumbent auditor in these equilibria, or they could be directly useful by providing useful information in a no-control equilibrium. Pro-incumbent operatives would be unlikely to suffice for maintaining a full-control equilibrium, unless the value of holding office is very large. They would also perform poorly in a no-control equilibrium, but they would suffice for maintaining a pandering equilibrium.

Returning, finally, to the Pentagon Papers, the successful auditing was carried out by the New York Times, generally recognized as a Democrat-leaning paper in that era (Puglisi 2006). Despite the negative consequences for the Democratic Party, and the legal and political pressure from the Nixon Administration, the papers were published because the market returns for the Times outweighed these various political pressures. Since some misbehavior certainly occurred, perfect control of the political actors was clearly not being maintained in this context. Since the Times was auditing at a relatively high level, we were likely in a pandering equilibrium. In such an equilibrium, an even more pro-incumbent auditor would have made matters no worse, and could have potentially improved electoral control.

A useful next step in this research stream is to move beyond the level of anecdote by empirically investigating the differential effects of media bias in different economic situations. Even within the U.S., the degree of media bias varies significantly over space and time (Larcinese et al. 2007), as do market returns to effective reporting (as measured by advertising revenues, perhaps (Gentzkow et al. 2006)) and the levels of political corruption (Glaeser and Saks 2006). This model predicts that the effect of bias on corruption should vary with the level of market returns, with moderate
bias increasing corruption for low market returns and decreasing it for high market returns.

References


Durante, Ruben and Brian Knight, “Partisan Control, Media Bias, and Viewer Responses: Evidence from Berlusconi’s Italy,” Journal of the European Economic Association, forthcoming.


5 Appendix

First define some useful notation and prove a useful Lemma. Then, prove Lemmas 1–3 and the propositions. Assume throughout that the congruent types follow their informative signals and choose action $x$ in the absence of a signal. Conditional on the politician receiving a informative signal, let $p^*(a)$ represent the probability with which a report is issued after action $a$. If $n + N \geq bv(a, \phi)$, $p^*(a) = p(a)$, otherwise $p^*(a) = 0$. Given these suppression/auditing actions, and strategies by the non-congruent choosing action $x$ after signal $s$ with probability $a(s)$, the voter’s posterior belief about the politician’s type after action $x$ and no report is higher than his prior belief if the following condition is satisfied:

$$\pi^*(x) \geq \pi_C \iff q\theta_x(1-p(x)) + (1-q) \geq q[\theta_xa(x)(1-p(x)) + (1-\theta_x)a(y)(1-p^*(x))] + (1-q)a(\phi).$$

After action $y$,

$$\pi^*(y) \leq \pi_C \iff q\theta_x(1-p^*(y)) + (1-q) \geq q[\theta_xa(x)(1-p^*(y)) + (1-\theta_x)a(y)(1-p(y))] + (1-q)a(\phi).$$

Using these beliefs, we can prove the following Lemma.

**Lemma 4** Any equilibrium must have $v(x, \phi) - v(y, \phi) \geq Z(2\theta_x - 1)$ and therefore have the non-congruent type (weakly) prefer to choose action $x$ after no signal.
Proof. Assume for contradiction that the condition strictly fails, so \( a(\phi) = 0 \), then the LHS of (8) exceeds the RHS, since \( q\theta_x(1 - p(x)) \geq q\theta_x a(x)(1 - p(x)) \) for any \( a(x) \), and \( 1 - q > q/2 > q(1 - \theta_x) \geq q(1 - \theta_x)a(y)(1 - p^*(x)) \). So \( \pi^*(x) > \pi^C \). A similar argument yields \( \pi^*(y) < \pi^C \), and so optimal voting must have \( v(x, \phi) = 1 \) and \( v(y, \phi) = 0 \), contradicting the initial assumption (since \( 2\theta_x - 1 \leq 1 \) and \( Z < 1 \)).

If follows immediately from this Lemma that any equilibrium must have \( \pi^*(x) \geq \pi^C \) and \( \pi^*(y) \leq \pi^C \).

Lemmas 1–3. Throughout, the non-congruent type’s optimal actions are governed by the three IC-constraint (1)–(3), while voting strategies are governed by (8) and (9). It suffices to work through the cases for the non-congruent type’s actions.

1. \( a(x) = 1 \) and \( a(y) = 0 \): Considered in the text

2. \( a(x) = 1 \) and \( a(y) > 0 \): In order to maintain \( \pi^*(x) \geq \pi^C \), as required by Lemma (4), we must have \( a(\phi) < 1 \), and so \( v(x, \phi) - v(y, \phi) = Z(2\theta_x - 1) \).

Consider first the case of information suppression. If there is any suppression, there will be suppression after action \( x \) (since \( v(x, \phi) > v(y, \phi) \)) and so \( p^*(x) = 0 \). But in this case, if \( p\pi^*(y) = \pi^C \) then \( \pi^*(x) < \pi^C \), a contradiction. So we must have \( \pi^*(x) = \pi^C \) and \( p\pi^*(y) < \pi^C \), implying \( v(x, \phi) = Z(2\theta_x - 1) \) and \( v(y, \phi) = 0 \). For these voting probabilities to satisfy (1) and so deliver \( a(x) = 1 \) requires \( p(x) \geq \frac{2Z(1-\theta_x)}{1-Z+2Z(1-\theta_x)} \). In the presence of information suppression with these voting probabilities, (2) becomes \( p(y) - Z(2\theta_x - 1) \geq Z \), and so \( a(y) > 0 \) requires \( p(y) < 2Z\theta_x \) with \( a(y) = 1 \) except on a knife edge. Finally \( a(\phi) \) is simply that which sets \( \pi^*(x) = \pi^C \).

In the absence of information suppression, there are two cases. When \( p(y) > p(x) \), we must have \( v(x, \phi) = Z(2\theta_x - 1) \) and \( v(y, \phi) = 0 \) for reasons identical to the suppression case. The only change is that (2) becomes \( p(y) - (1 - p(x))(2\theta_x - 1) \geq Z \), and so \( a(y) > 0 \) now requires \( p(y) \leq Z[1 + (1 - p(x))(2\theta_x - 1)] \). When \( p(x) > p(y) \) the argument about voting is reversed, and indifference after action \( x \) now implies a strict preference to reelect after action \( y \), a contradiction. So, instead, we must have a strict preference to reelect after action \( x \) and indifference after action \( y \), yielding \( v(x, \phi) = 1 \) and \( v(y, \phi) = 1 - Z(2\theta_x - 1) \).

With these reelection probabilities (1) becomes \( 1 - (1 - p(y)(1 - Z(2\theta_x - 1))) \geq Z \), requiring \( p(y) \geq \frac{2Z(1-\theta_x)}{1-Z+2Z(1-\theta_x)} \) to maintain \( a(x) = 1 \), and (2) becomes \( p(y) + (1 - p(y))(2\theta_x - 1) \geq Z \), requiring \( p(x) \leq Z[1 + (1 - p(x))(2\theta_x - 1)] \) to maintain \( a(y) > 0 \), with \( a(y) = 1 \) except on a knife-edge. Again, in both these cases, \( a(\phi) \) is simply that which
3. \( a(x) < 1 \) and \( a(y) = 1 \): Consider first the equilibria with suppression. Suppression after action \( y \) cannot be part of an equilibrium, because if it is, so is suppression after action \( x \), and it would follow from (8) and (9) that \( \pi^*(y) < \pi^C \), and so \( v(y, \phi) = 0 \), contradicting suppression after action \( y \). So any equilibrium with suppression must have suppression after action \( x \) only. Assuming that \( a(\phi) = 1 \), \( \pi^*(y) = \pi^C \) would imply \( p\pi^*(x) < \pi^C \), a contradiction, so we again need \( v(y, \phi) = 0 \). Replacing for the reelection probability, (1) becomes \( p(x) + (1 - p(x))v(x, \phi) \geq Z \), so \( a(x) < 1 \) requires \( v(x, \phi) \leq \frac{z - p(x)}{1 - p(x)} \). For these voting probabilities to also induce \( a(\phi) = 1 \) in (3), requires \( \frac{z - p(x)}{1 - p(x)} \geq Z(2\theta_x - 1) \), or \( p(x) \leq \frac{2Z(1 - \theta_x)}{1 - Z + 2Z(1 - \theta_x)} \). Finally, for the politician to set \( a(y) = 1 \) requires \( p(y) - \frac{z - p(x)}{1 - p(x)} \leq Z \) or \( p(y) \leq Z + \frac{z - p(x)}{1 - p(x)} = 2Z - (1 - Z)p(x) \).

In the absence of suppression, there are again two cases. When \( p(y) > p(x) \), for reasons identical to the above, we have \( v(y, \phi) = 0 \), and \( a(x) < 1 \) again requires \( v(x, \phi) \leq \frac{z - p(x)}{1 - p(x)} \). The same condition for inducing \( a(\phi) = 1 \) yields the same \( p(x) \leq \frac{2Z(1 - \theta_x)}{1 - Z + 2Z(1 - \theta_x)} \). Without suppression, however, for the politician to set \( a(y) = 1 \) requires \( p(y) - (z - p(x)) \leq Z \) or \( p(y) + p(y) \leq 2Z \). When \( p(x) > p(y) \), \( \pi^*(x) = \pi^C \) would imply \( \pi^*(y) > \pi^C \), contradicting Lemma 4, so we have \( v(x, \phi) = 1 \). Replacing for the voting probability in (1), \( a(x) < 1 \) requires \( v(y, \phi) \geq \frac{1 - Z}{1 - p(y)} \). To also have \( a(\phi) \geq 0 \) requires, then \( 1 - \frac{1 - Z}{1 - p(y)} \geq Z(2\theta_x - 1) \) or \( p(y) \leq \frac{2Z(1 - \theta_x)}{1 - Z + 2Z(1 - \theta_x)} \). Finally, replacing for the voting probabilities in (2), \( a(y) = 1 \) requires \( p(y) + (1 - p(y))\frac{1 - Z}{1 - p(y)} - (1 - p(x)) \leq Z \) or \( p(x) + p(y) \leq 2Z \).

4. \( a(x) = 0 \) with any \( a(y) \): With or without suppression, \( \pi^*(y) < \pi^C \), so \( v(y, \phi) = 0 \). This means any suppression possible would occur after action \( x \). If \( \pi^*(x) > \pi^C \), \( v(x, \phi) = 1 \), and \( a(x) = 0 \) cannot be optimal. Instead, we need \( \pi^*(x) = \pi^C \), which requires \( a(\phi) = 1 \) and \( a(y) = \frac{\theta_x}{1 - \theta_x}(1 - p(x)) \). For this probability to be less than one requires \( p(x) \geq 2 - \frac{1}{\theta_x} \). Furthermore, for the politician to be willing to randomize after signal \( y \) requires \( p(y) - v(x, \phi) = Z \), and so \( v(x, \phi) = p(y) - Z \). To also have \( a(\phi) = 1 \) requires \( v(x, \phi) \geq Z(2\theta_x - 1) \) or \( p(y) \geq 2Z\theta_x \). Finally, for the politician to prefer action \( y \) after signal \( x \) requires \( p(x) + (1 - p(x))v(x, \phi) \leq Z \) or \( p(y) \leq 2Z - (\frac{p(x)}{1 - p(x)})(1 - Z) \). Summing up, we need \( p(x) \leq \frac{2Z(1 - \theta_x)}{1 - Z + 2Z(1 - \theta_x)} \) and \( 2Z\theta_x \leq p(y) \leq 2Z - \frac{p(x)}{1 - p(x)}(1 - Z) \).

Without suppression, \( \pi^*(x) > \pi^C \), so \( v(x, \phi) = 1 \), and so \( a(x) = 0 \) cannot be part of any equilibrium, since (1) becomes \( 1 \geq Z \), which is always satisfied.

5. \( 0 < a(x) < 1 \) and \( a(y) < 1 \): Suppression after both \( x \) and \( y \) again leads to immediate contradiction as it implies \( p\pi^*(y) < \pi^C \) and thus \( v(y, \phi) = 0 \), so suppression must only occur
after action $x$. Any suppression equilibrium is knife-edged in the auditing probabilities. Consider first the case when $a(\phi) = 1$. In this case, (8) imply that $v(y, \phi) = 0$, so (1) implies that randomization after $x$ requires $v(x, \phi) = Z_{-p(x)}{1-p(x)} < 1$. For voters to be willing to randomize after $x$ requires $\pi^*(x) = \pi^C$. By (8) this requires an interior $a(y)$, so we’ll also need $p(y) - v(x, \phi) = Z$, by (2). Already, this requires a knife-edge of auditing probabilities, since replacing for $v(x, \phi)$ yields $p(y) = 2Z - (1 - Z) \frac{p(x)}{1-p(x)}$. Finally, the requirement that $a(\phi) = 1$ requires $p(x) \leq \frac{2Z(1-\theta_x)}{1-Z+2Z(1-\theta_x)}$.

Maintaining suppression, if $a(\phi) < 1$ and $a(y) > 0$ all three IC-constraints, (1)-(3), must hold with equality, certainly requiring a knife-edge of auditing probabilities. Its easy to check that these probabilities must also fall in the no-control range. Finally, if $a(\phi) < 1$ and $a(y) = 0$, the equilibrium conditions are be nearly identical to the no-suppression case since there is no bad information to suppress after action $x$ (since $a(y) = 0$).

Without suppression, there are again three cases, all of which are knife-edges. When $a(\phi) = 1$, $\pi^*(x) = \pi^C \iff \pi^*(y) = \pi^C$, and if this condition fails, the politician cannot be indifferent after signal $x$. From either (8) or (9), voter indifference requires $a(y) = \frac{\theta_x}{1-\theta_x}(1 - a(x)) > 0$. So both (1) and (2) must be satisfied with equality, a knife-edge in the auditing probabilities that also requires $p(x) + p(y) = 2Z$ and $p(x) \leq \frac{2Z(1-\theta_x)}{1-Z+2Z(1-\theta_x)}$.

When $a(\phi) < 1$ we need $a(y) > 0$ or else both (8) and (9) are strictly satisfied, violating $a(\phi) < 1$. Furthermore, if $p(y) > p(x)$, $v(y, \phi) = 0$ and $v(x) = Z(2\theta_x - 1)$, and randomization by the politician after $x$ requires $p(x) = \frac{2Z(1-\theta_x)}{1-Z+2Z(1-\theta_x)}$ and randomization after $y$ requires $p(y) = Z[1 + (2\theta_x - 1)(1 - p(x))]$. Finally, if $p(x) > p(y)$, $v(x, \phi) = 1$ and $v(1) = 1 - Z(2\theta_x - 1)$, and randomization by the politician after $x$ requires $p(x) = \frac{2Z(1-\theta_x)}{1-Z+2Z(1-\theta_x)}$ and randomization after $y$ requires $p(x) = Z[1 + (2\theta_x - 1)(1 - p(y))]$.

\section*{Proposition 1.}

For any $b, n > b$ guarantees no information suppression. Furthermore, if $n$ is high enough, $p(x) = p(y) = 1$. Let $\bar{n}$ be the maximum of these two, so $(\bar{n}, b, N)$ induces $p(x) = p(y) = 1$ and no suppression. By Lemma 1, these auditing probabilities are sufficient for maintaining a full-control equilibrium. Since $n$ is bounded below by zero and $\bar{n}$ is an upper bound on $\bar{n}$ there is a least upper bound. Since $\bar{n}$ exists, so does $\bar{n}$, since $\bar{n}$ is an upper bound on it.

1. For $b \leq 0$ there is no suppression of bad news since $\pi + N > b$. By Lemma 2, an infinitesimal increase in $b$ causes an increase in (at least) the minimum of $p(x)$ and $p(y)$. This loosens both constraints in Lemma 1, allowing for a reduction in $\bar{n}$. Since $\bar{n}$ is initially decreasing
in $b$ in the absence of suppression, for every $N$ there exists a minimum $\tilde{b} > 0$ such that $\tilde{b} = \frac{\pi(b) + N}{Z(2\theta_x - 1)}$. At this point, any further increase in $b$ would increase auditing slightly, but lead to suppression after action $x$ and bad news, off the equilibrium path. If $n = \pi$, there is nothing to prove for $n$. If $n < \pi$, and no suppression occurs, increasing $b$ always increases the minimum of $p(x)$ and $p(y)$. This follows directly from the auditing efforts derived in the text and the voting probabilities in Lemma 2. So an increasing in auditing brought about by increased bias allows a reduction in $n$. This continues until $b = \frac{n(b) + N}{v(x, \phi)}$, but since $v(x, \phi) \geq Z(2\theta - 1)$ and $n(b) \leq \pi(b)$, this equality occurs for $b \leq \tilde{b}$.

2. $\tilde{b}$ is implicitly given by $\tilde{b} = \frac{\pi(b) + N}{Z(2\theta_x - 1)}$. Since there is no direct effect of increasing $N$ on auditing, the implicit function theorem directly delivers the result that $\tilde{b}$ increases in $N$. The argument for $b$ increasing in $N$ is similar but with one complication. Increasing $N$ allows you to lower $n$ in a pandering equilibrium, but less than one-for-one, since the auditor receives $n$ whenever she receives $N$, but the opposite is not true. This means that, for any $b$, increasing $N$ increases $n + N$, so the implicit function theorem on $b = \frac{n(b) + N}{v(x, \phi)}$ delivers the result.

3. $N$ has no direct effect on equilibrium auditing in a full-control equilibrium, so if $b < \tilde{b}$, increasing $N$ cannot affect $\bar{n}$. When $b > \tilde{b}$, $\bar{n}$ is set by the no-suppression condition $b = \frac{n(b) + N}{Z(2\theta_x - 1)}$, so in this range an increase in $N$ brings about a 1-for-1 decrease in $\bar{n}$.

Proposition 2.

1. Since $\bar{n}$ exists, so does $\underline{n}$, since $\bar{n}$ is an upper bound on it.

2. If $n = \pi$, this follows from Proposition 1. If $n < \pi$, in the presence of pandering, increasing $b$ will increase both $p(y)$ and $p(x)$, since bad news will simply be concealed. In the absence of pandering, increasing $b$ always increases the minimum of $p(x)$ and $p(y)$. This follows directly from the expressions in the text and the voting probabilities in Lemma 2. In both cases, the increase in auditing brought about by increased bias allows a reduction in $n$.

3. When $n + N < bZ(2\theta_x - 1)$ information is suppressed and $N$ has no impact on auditing, so there is no change in $n$ as $N$ changes. When $n + N \geq b(2\theta_x - 1)$, increasing $N$ increases $p(x)$. When $p(y) > p(x)$, this auditing increase allows an offsetting decrease in $n$ to keep $p(x)$ constant. Of course, once $p(x) > p(y)$, any further increases in $N$ no longer affect $\min\{p(x), p(y)\}$ and so no longer decrease $n$.

32