OPTIMAL AGENCY BIAS AND REGULATORY REVIEW

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ABSTRACT. Why do presidents appoint agency heads who hold more extreme policy views than the president and subject their decisions to review by a more aligned bureaucrat? We posit an explanation based on the interplay between two types of agency costs: shirking on information production and policy bias. Presidents appoint biased agents because they shirk less. Moreover, the president prefers to subject agency decisions to review by a more aligned bureaucrat rather than to fully delegate to the agency. In contrast to existing accounts, in our model the use by the president of ideological bureaucrats at the regulatory agencies and centralized regulatory review are complements. The use of bias to mitigate shirking results in an amplification of the swings of regulatory policy and heightens the role of regulatory policy in partisan politics.

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1. INTRODUCTION

In January 2010, the Environmental Protection Agency (EPA) proposed a rule that would have substantially tightened the standard for ozone under the Clean Air Act.[1] But in September 2011, the EPA's ozone proposal was quashed following a review of the policy by the White House Office of Information and Regulatory Affairs (OIRA). In his letter to EPA Administrator Lisa Jackson announcing the decision, Cass Sunstein, the Administrator of OIRA, explained that President Obama had "directed [him] to give careful scrutiny to all regulations that impose significant costs on the private sector" and "does not support finalizing the rule at this time."[2] The President, of course, appointed both Jackson and Sunstein to their respective posts, choosing a self-described environmentalist to lead EPA and a proponent of cost benefit analysis to head OIRA. Moreover, President Obama issued executive orders requiring that significant rules issued by EPA (and other executive agencies) be subject to OIRA review, continuing a practice that dates back to the Nixon administration.[3]

In this paper we provide a rationale for a president appointing agency heads who hold more extreme policy views than the president and instituting a review process for the rules proposed by the agencies led by a bureaucrat at OIRA with views more in line with the president's. Our explanation is based on the interplay between two types of agency costs that stem from the delegation of lawmaking power to agencies: *shirking* and *bias*.

First, information is a key input into lawmaking, and generating information is costly. When responsibility for information production is delegated to regulatory agencies, the bureaucrats at those agencies might shirk rather than exert the optimal amount of costly effort to generate information (Stephenson, 2011).

[1] 75 Fed. Reg. 2,938 (Jan. 10, 2010).
[2] Letter from Cass Sunstein to Lisa Jackson, Sept. 2, 2011, available at `http://www.whitehouse.gov/sites/default/files/ozone_national_ambient_air_quality_standards_letter.pdf`.
[3] Exec. Order 13,563, 76 Fed. Reg. 3,821 (Jan. 18, 2011); Exec. Order 13,610, 77 Fed. Reg. 28,469 (May 14, 2012).

Second, bureaucrats may have policy preferences that differ from those of the president, Congress, or the average citizen. These could be intrinsic policy preferences or alternatively preferences that are induced by some implicit incentive scheme. Biased policy preferences may skew both bureaucrats' willingness to divulge information and the policy choices they make.

We show how agency bias can be harnessed to mitigate the problem of agency shirking. Consider the president's choice of bureaucrat to head an agency responsible for regulating in some domain, say the environment. Should the president appoint a bureaucrat whose intrinsic policy preferences correspond to the president's? While such a bureaucrat would choose the president's preferred rules, conditional on their information, they have suboptimal incentives to exert effort to generate information.

Accordingly, we show that the president should choose an agency head whose preferences are more extreme than the president's. For example, the president might appoint someone who values environmental quality to a greater extent than she does. A person who places greater value on clean air, say, is willing to work harder to find regulatory opportunities to improve air quality. Hence, appointing such a person can help on the extensive margin of regulation—more harmful pollutants, say, are identified and brought under control. This incentive effect comes at a cost, of course. A biased agency (relative to the president) will generally get the intensive margin of regulation wrong. That is, conditional on the information the agency has generated, the agency will not choose the rule (e.g., stringency) preferred by the president. We show that this tradeoff generally results in the president preferring a relatively biased agency.

How does this use of agency bias interact with other institutional tools for controlling agencies? We focus in particular on regulatory review by the White House. One might worry that such review would nullify the agency bias approach to incentivizing information production by agencies. With the ultimate policy decisions made according to the preferences of the president, a biased agency would be getting policies that could be quite far from its ideal point and thus have less incentive to generate information about regulatory opportunities. However, regulatory review also reduces the cost of agency bias, and we show that regulatory review and agency bias are thus complements. An important (and heretofore unconsidered) effect of OIRA review is to encourage the appointment

of more extreme bureaucrats at the agencies. We show that the president can generally do better with a biased agency and regulatory review than she can by delegating complete authority to the agency.

An important limitation of this approach to mitigating shirking by agencies is the possibility of strategic information disclosure by the agency. If the preferences of the agency and the reviewer are too far apart, the agency may hide information from the reviewer, which results in regulations that are less tailored to the specific circumstances of the rule (e.g., the level of harm done by a pollutant). This problem can inhibit the use of agency bias as a motivational instrument.

Another consideration that can influence presidents' use of agency bias is a stock of existing rules that the president wants to make less stringent. Together with the task of identifying new regulatory opportunities, this produces a multitask incentive problem for the president. To mitigate shirking by the agency on the deregulatory task, the president may appoint agency staff that are even more anti-regulatory than the president is.

Of course, presidential appointment decisions involve many other political and managerial considerations, and there are alternative potential explanations for appointments of biased agency staff, such as a desire to reward particular political constituencies. Our goal in this paper is not to empirically test competing theories but rather to offer a new explanation based on agency shirking and analyze its implications.

Our theory helps explain a range of features of the institutions, politics, and policy outcomes of administrative decisionmaking. Why, for example, do we organize regulatory decision making in organizations with relatively focused missions—the Environmental Protection Agency is responsible for the environment, the Department of Defense for national security, and so forth? We suggest that one reason is to cultivate a staff of bureaucrats with policy preferences biased towards a particular regulatory goal in order to generate more effort (i.e., less shirking) to produce information. Our theory also implies that the use of agency bias as a motivational instrument results in an amplification in the swings of regulatory policy and heightens the role of regulatory policy in partisan politics.

In this paper we present a "control rights" view of how governmental institutions address incentive problems (Grossman and Hart, 1986; Tirole, 1994). That is, rather than consider explicit incentive schemes, we consider how allocating various decision rights to particular agents can allow the principal to best achieve her goals. Previous work that has taken a similar approach to modeling organizational behavior includes Aghion and Tirole (1997), Dewatripont and Tirole (1999), Besley and Ghatak (2005), Prendergast (2007), de Mesquita and Stephenson (2007), Gailmard and Patty (2007), and Stephenson (2007).

We build on a substantial existing literature on presidents' use of ideologically motivated appointees and centralized review to control agencies. These two tools of presidential control are referred to in the literature as "politicization" and "centralization," respectively. Moe and Wilson (1994) argue that while presidents can improve their control of agencies by appointing "loyal, ideologically compatible people in pivotal positions" at the agencies, such a politicization strategy will be imperfect. Political appointees at the agencies remain at an informational disadvantage vis-à-vis career civil servants, and moreover are influenced by the career staff to take the perspective of the agency. Consequently, presidents also centralize decisionmaking authority to further rein in agencies' residual noncompliance with presidential policy objectives. On this standard account, then, politicization and centralization are substitutes.

Calvert, McCubbins, and Weingast (1989)'s classic formal model of political control of agencies takes a similar approach, with centralized control only useful because of uncertainty about the preferences of appointees ex ante. Many subsequent formal models of regulatory review take the policy preferences of agencies and the centralized reviewer as exogenous (e.g., de Mesquita and Stephenson, 2007; Acs and Cameron, 2012). In contrast, we incorporate the appointments power and centralized review into a single model and show that the agency shirking problem can lead to *complementarity* between politicization and centralization.

The two papers in the literature most similar to ours are Prendergast (2007) and Gailmard and Patty (2007). Prendergast (2007) shows how biased preferences can induce effort by otherwise weakly-motivated agents. He applies this insight to the problem of inducing street-level bureaucrats to identify the proper recipients for some publicly-provided private good. But in his model,

the principal's problem is to find the type of bias that will produce the optimal tradeoff between effort and wage costs. By contrast, we model policymaking bureaucrats and focus on the tradeoff between bureaucratic effort and policy bias.

Gailmard and Patty (2007) provide a model in which only bureaucrats with strong policy preferences are willing to put in effort. While this produces an implicit policy-effort tradeoff, in their model the principal cannot directly control the policy preferences of bureaucrats. Instead, they focus on how civil service tenure and the nature of Congressional delegation to agencies affect the incentives of bureaucrats to make up-front investments in expertise. In contrast, we model the appointment and delegation decisions of the president and show why presidents will actively appoint biased bureaucrats to regulatory agencies but subject their decisions to review by more aligned bureaucrats.

The paper is organized as follows. In section 2 we provide our baseline model of presidential control of agencies. In section 3 we illustrate the results of our analysis using two historical examples from the Nixon administration: (1) the revitalization of the Federal Trade Commission; and (2) the creation of the Environmental Protection Agency and corresponding institution of centralized regulatory review. In section 4 we consider two extensions of our baseline model: (1) asymmetric information between the agency and the central reviewer; and (2) a deregulatory task for the agency in addition to the task of finding new regulatory opportunities. In section 5 we conclude by suggesting some implications of our analysis for the debate over the normative desirability of centralized regulatory review.

2. The Baseline Model

2.1. **Setup.** We consider a setting where there are potential regulatory opportunities in some domain, but they are initially unknown. To be concrete, consider environmental regulation and think of a regulatory opportunity as, for example, a pollutant that can be controlled. Suppose Congress has delegated authority to a regulatory agency to generate rules in this domain. Taking this delegation by Congress as exogenous, we model the institutional design problem of a President who wants to control the agency to further certain policy objectives. We focus on two design issues:

the type of bureaucrats the President will appoint and whether to appoint a separate bureaucrat to review rules proposed by the agency. For now we suppose that there are no extant rules in this domain. The baseline model most directly describes the design of a new regulatory agency. We consider the revision of existing regulations in an extension to the model in section 4.2 below.[4]

A bureaucrat at the agency can generate information about regulatory opportunities within its purview by exerting costly effort to *search*. We will refer to this bureaucrat as simply the *Agency*.[5] In particular, to generate a probability e of finding a new regulatory opportunity, the Agency must bear a cost $\psi(e)$, with $\psi'(0) = 0$, $\psi''(\cdot) > 0$, and $\lim_{e\to 1} \psi'(e) = \infty$.

For some of our results we need to make a slightly stronger assumption on the curvature of the Agency's effort-cost function. In particular,

Assumption 1. $\frac{\partial \frac{\psi'(e)}{\psi''(e)e}}{\partial e} \leq 0$.

In economic terms, Assumption 1 says that the elasticity of supply of effort with respect to the Agency's payoff is non-increasing in effort. It is satisfied by standard effort-cost functions.[6] In the propositions that follow, we explicitly identify results that rely on this assumption.

If the Agency finds a regulatory opportunity, he can then create a regulation. A regulation is defined by its *stringency* $s \geq 0$. Think of stringency as how tightly the regulation controls the pollutant. A higher stringency would correspond to a lower parts per million regulatory standard, for example. We assume that stringency has constant gross marginal benefit B, but also imposes costs to society $c(s)$. These costs include, for example, the installation of equipment at power plants to

[4]As long as the President does not have too strong a desire to deregulate, the predictions of the baseline model apply in the case of an agency with a stock of existing rules as well.

[5]A word is in order about the nature of the "Agency" in our model. Obviously regulatory agencies are large organizations made of many, typically thousands of, bureaucrats, most of whom are career civil servants and some of whom are political appointees. We model this complex reality by reducing the agency to a single actor. We focus on the President's appointment power as the principal way the President shapes the Agency's preferences. We think of this as applying not just to the direct political appointees but also, to a lesser extent, to career staff. The President's political appointees have a range of levers by which they can shape the preferences of the career staff, such as through reorganizations and, of course, hiring decisions. See section 3 below for examples of the President's use of the appointments power to shape the preferences of both political appointees and civil service staff in the federal bureaucracy.

[6]This assumption is satisfied by any polynomial $\psi(e) = Ae^k$. But such a polynomial would not satisfy our earlier assumption that $\lim_{e\to 1} \psi'(e) = \infty$. Any convex function of the form $\psi(e) = Ae^k/(1-e)$ satisfies this condition and all of our other assumptions on $\psi(\cdot)$.

control the levels of the pollutant. For simplicity, we will assume that $c(s)$ takes a quadratic form so that the social net benefit of a regulation is $Bs - c(s) = Bs - \frac{s^2}{2}$.

However, there are two incentive problems posed by delegation to the Agency. First, while the Agency bears all of the costs of his search effort, his ultimate regulatory decision produces large externalities. Think of an environmental standard that generates billions of dollars in compliance costs and saves tens of thousands of lives. We assume that bureaucrats are to some extent intrinsically motivated to achieve the goals of regulation. In particular, we assume a form of social preferences such that the Agency enjoys a fraction $\gamma \in (0, 1)$ of the social net benefits of regulation. Because $\gamma < 1$, there is a problem with incentivizing the Agency to exert socially optimal effort to identify regulatory opportunities. That is, we are assuming that incentive pay and the like cannot implement first best effort levels, perhaps due to difficulty in measuring bureaucratic effort and output.[7] Relatedly, and more importantly for our purposes, the President faces a problem in motivating bureaucratic effort.

Second, the Agency's social preferences may include some bias in how he weights the benefits and costs of regulation. The Agency weights the gross costs of regulation by 1 but weights the gross benefits by $k_A \in [0, k^{max}]$. The greater is k_A, the more the Agency cares about the benefits relative to the costs of the regulation. Think of k_A as measuring how "pro-regulatory" or "mission-oriented" (where the mission is defined in terms of regulatory benefits, e.g., environmental protection) the Agency is.

Together, these assumptions imply that the Agency's ex post payoff from the ultimate policy decision and his search effort is given by the utility function,

$$U_A(e, s) = \gamma[k_A Bs - \frac{s^2}{2}] - \psi(e), \tag{1}$$

where the case of not finding a regulatory opportunity corresponds to $s = 0$.

[7]Of course, in general extrinsic motivations like the desire for promotion produce some effort by bureaucrats independent of any social preferences. Our focus in this model is on the residual shirking that such extrinsic motivations do not eliminate.

Suppose that the President values policy payoffs according to the utility function,

$$U_P(e, s) = \gamma[k_P Bs - \frac{s^2}{2}], \tag{2}$$

where $k_P \in [k_P^{min}, k_P^{max}]$.[8] We assume that $k_P^{min} > 0$ and $k_P^{max} < k^{max}$ so that it is always possible for the Agency to be strictly less or strictly more pro-regulatory than the President.

Suppose that the President has authority to appoint the Agency and that k_A is observable. What type of Agency will the President appoint? We consider this question under two alternative institutional designs that the President might employ: (1) full delegation of authority to the Agency to search for regulatory opportunities and set stringency; and (2) delegation to the Agency of the job of searching for regulatory opportunities but institution of regulatory review by a separately appointed bureaucrat, a *Reviewer*.

2.2. **Full delegation to the Agency.** We begin with full delegation. This case would apply most directly to, for example, independent agencies that are outside of direct presidential control. The sequence of moves in the model is:

1. President appoints Agency by choosing k_A.
2. Agency chooses search effort e.
3. With probability e, Agency finds a regulatory opportunity (if not, game ends).
4. Agency chooses stringency s.

2.2.1. *Stringency and search effort.* We find the equilibrium of the model by starting with the Agency's choice of stringency. The Agency chooses s to solve,

$$\max_{s \geq 0} \gamma \left[k_A Bs - \frac{s^2}{2} \right]. \tag{3}$$

[8]For notational convenience we are assuming that the President weights the net social benefits by the same γ as the Agency. This is without loss of generality. Multiplying by any $\gamma > 0$ is simply a monotone transformation of the utility function that preserves the President's preference ordering.

Denote the solution to this problem, as a function of k_A, as $s^*(k_A)$. Given our assumptions, the solution is defined by the first order condition,

$$s^*(k_A) = k_A B. \tag{4}$$

Note that the Agency's choice of stringency level is strictly increasing in k_A, since $\frac{\partial s^*(k_A)}{\partial k_A} = B > 0$.

Denote the value of the maximal policy payoff to the Agency in (12) by $V(k_A) = \gamma \frac{1}{2} k_A^2 B^2$.

The President, in contrast, prefers the stringency that solves,

$$\max_{s \geq 0} \gamma \left[k_P B s - \frac{s^2}{2} \right], \tag{5}$$

the solution to which has the same functional form as the Agency's choice function, $s^*(k_P) = k_P B$. Thus, when $k_A = k_P$, the Agency chooses the President's preferred stringency for any regulatory opportunity he finds.

Turning now to the Agency's search effort, the Agency chooses effort level e to solve,

$$\max_{e \in [0,1]} eV(k_A) - \psi(e). \tag{6}$$

Denote the solution, as a function of k_A, by $e^*(k_A)$. Our assumptions guarantee that it is defined by the first order condition,

$$V(k_A) = \psi'(e^*(k_A)). \tag{7}$$

Lemma 1. *Agency search effort is strictly increasing in k_A, $e^{*'}(k_A) > 0$.*

All proofs are relegated to the Appendix.

The President thus faces a tradeoff between incentives for effort provision and stringency choice. An Agency who shares the President's policy preferences, $k_A = k_P$, will choose the President's preferred stringency. But the President can get more search effort from an Agency who places greater weight on the benefits of regulation, $k_A > k_P$, at a cost of biased stringency. Agency

bias helps the President on the extensive margin of regulation—more regulatory opportunities are identified—but hurts the President on the intensive margin of regulation—stringency is set too high.

2.2.2. *Agency bias.* Consider now the President's optimal choice of Agency bias given this trade-off. Denote the policy payoff to the President, when stringency is chosen according to preferences k_A, by $V(k_P, k_A)$, which is given by,

$$V(k_P, k_A) = \gamma[k_P B s^*(k_A) - \frac{s^*(k_A)^2}{2}] = \gamma\left[k_P k_A - \frac{k_A^2}{2}\right]B^2. \tag{8}$$

The President thus solves the problem,

$$\max_{k_A \in [0, k^{max}]} \left\{ e^*(k_A) V(k_P, k_A) \right\}. \tag{9}$$

Denote the solution k^*.

Proposition 1. *Equilibrium under full delegation.*

(1) The President chooses a relatively pro-regulatory Agency, $k^* > k_P$.

(2) Equilibrium Agency preferences are weakly increasing in the preferences of the President, $\frac{\partial k^*}{\partial k_P} \geq 0$.

(3) For sufficiently high k^{max}, $k^* < k^{max}$ and $\frac{\partial k^*}{\partial k_P} > 0$.

Proposition 1 characterizes how Presidents will use their appointments power in the case of full delegation to the Agency. The President does not want to appoint an "ally" in the sense of someone who shares the President's policy preferences. Rather, the President prefers an Agency who is biased towards the mission of the Agency, despite the consequent bias to policy. Even modestly anti-regulatory Presidents with $k_P < 1$ may prefer to appoint a pro-regulatory Agency with $k_A > 1$.

The reason it is optimal to have a relatively pro-regulatory Agency is that increasing k_A above $k_A = k_P$ causes a first order increase in the President's utility by making the Agency work harder to find regulatory opportunities. While this causes a distortion on the choice of stringency, the

utility loss from that effect as you move away from the President's ideal point is only second order. But the cost of the bias to policy gets larger as k_A increases. If k^{max} is sufficiently high, then the President's optimal choice of Agency bias is in the interior (i.e., $< k^{max}$).

Finally, the proposition establishes that Presidents who are more pro-regulatory over the Agency's domain should appoint more pro-regulatory Agency staff, as one would expect.

2.3. **Regulatory review.** Consider now how the institution of regulatory review affects the use of Agency bias as a motivational instrument. In particular, suppose that rather than choosing the stringency, the Agency can only "propose a rule" to a Reviewer. If the Agency does not propose a rule, the game ends and the players get policy payoffs from the status quo, i.e., $s = 0$. If the Agency does propose a rule, then the Reviewer gets to choose the rule's stringency.[9]

The Reviewer's policy preferences have the same basic structure as that of the Agency's. In particular, the Reviewer weights the gross benefits of regulation by k_R, with $k_R \in [0, k^{max}]$, so the Reviewer's preferences over the ultimate policy decision can be represented by the utility function,

$$U_R(s) = \gamma[k_R B s - \frac{s^2}{2}]. \tag{10}$$

The sequence of moves in the model is now:

1. President appoints Agency and Reviewer by choosing k_A and k_R.
2. Agency chooses search effort e.
3. With probability e, Agency finds a regulatory opportunity (if not, game ends).
4. Agency chooses whether to propose a rule to the Reviewer (if not, game ends).
5. Reviewer chooses stringency s.

We make the simplifying assumption that the President can commit to delegating authority to the Reviewer, even if the Reviewer has different policy preferences than the President. This is a

[9]Our simplifying assumption that the Reviewer gets to set stringency following a proposal is not necessary for our basic results. An arguably more realistic assumption that the Reviewer simply has a veto right would yield similar results, as discussed in more detail in footnote 11 below.

reasonable way to model regulatory review given the many competing demands on the president's time and attention.[10]

2.3.1. *Stringency and search effort.* We begin with the subgame in which the Reviewer chooses stringency. The Reviewer's optimal choice of stringency is given by the now familiar function, $s^*(k_R) = k_R B$. Given this equilibrium strategy of the Reviewer, the policy payoff to the Agency, when stringency is chosen according to preferences k_R, is given by $V(k_A, k_R)$ (the same function as in (8) but evaluated at k_A instead of k_P). Note that $V(k_A, k_R) > 0$ if and only if $k_A > k_R/2$. If this condition holds, the Agency chooses search effort to set $\psi'(e) = V(k_A, k_R)$. Otherwise, the Agency will exert no effort and find no regulatory opportunities. Denote the Agency's optimal search effort by $e^*(k_A, k_R)$.[11]

2.3.2. *Agency bias.* Consider now the choice of the President. Her choice problem is to choose the Agency and Reviewer in order to affect both policy and effort. Formally, she solves,

$$\max_{k_A, k_R} \left\{ e^*(k_A, k_R) V(k_P, k_R) \right\}. \tag{11}$$

Denote the choices of k_A and k_R that solve this problem by k_A^* and k_R^*.

Proposition 2. *Equilibrium under regulatory review.*

(1) The President chooses a maximally pro-regulatory Agency, $k_A^* = k^{max}$.

[10] Aghion and Tirole (1997) show that giving the principal a broad span of control can be a useful device to commit to delegation, leading to greater initiative by the agent. Moreover, analyses of the practice of regulatory review show that the president indeed only rarely personally intervenes in rulemakings under OIRA review (Livermore and Revesz, 2012).

[11] If we instead assume that the Reviewer only has the right to veto the Agency's proposal, and not the right to set stringency, then the Agency will propose the policy closest to his ideal point that the Reviewer will accept and the Reviewer will accept it. The Agency will anticipate that outcome and choose his effort accordingly. The key insight in connecting this alternative model to our baseline model is that in both cases the President essentially completely chooses the stringency to be implemented by choosing the Reviewer. In the baseline model she implements stringency s^* by choosing $k_R = B/s^*$ while in the alternative model she does it by choosing the k_R such that $k_R B s^* - (s^*)^2/2 = 0$. The key result, that she will choose to implement a policy that is more stringent than her own ideal policy in order to induce extra effort by the Agency, is unchanged.

(2) The President chooses a Reviewer who is more pro-regulatory than she is, but not maximally pro-regulatory, $k_P < k_R^* < k^{max}$, and more pro-regulatory Presidents appoint more pro-regulatory Reviewers, $\frac{\partial k_R^*}{\partial k_P}$.

(3) Under Assumption 1, the President's choice of Reviewer is less pro-regulatory than her choice of Agency under full delegation, $k_R^* < k^*$.

(4) The President strictly prefers a regulatory process that includes regulatory review to full delegation to the Agency.

The President, whatever her policy preferences, prefers a maximally pro-regulatory Agency because the tasks of search and policymaking are separated. The Agency's search effort increases in his bias, and with the tasks separated, there is no policy cost from having a biased Agency. Nevertheless, the tradeoff between policy and effort remains at a different level. The Agency is willing to work even harder as the Reviewer becomes more similar to him, and the President will use that extra incentive to induce even higher effort, to some extent. The President prefers a relatively pro-regulatory Reviewer because the consequent improvement in the Agency's effort outweighs the cost from the resulting bias to policy.

Finally, the President always strictly prefers to have regulatory review rather than to delegate fully to the Agency. There are two reasons for this. First, and very directly, regulatory review allows the President to choose a *more extreme* Agency. Holding the preferences of the Reviewer (and, therefore, policy) fixed, this move alone increases Agency effort, resulting in more regulatory opportunities discovered, and increases the President's payoff. An implication of the model, then, is that the availability of OIRA review encourages greater use of agency bias as a motivational instrument. Thus, all else equal, we expect presidents to appoint more extreme agency staff for agencies subject to OIRA review than for independent agencies.

Second, the presence of regulatory review can reduce equilibrium policy bias. Whether it does so is actually theoretically ambiguous under our baseline assumptions. To see this, consider the situation under regulatory review in which k_A is set optimally at k^{max} and k_R is set at k^*, the optimal Agency bias under full delegation. Will the President want to increase or decrease k_R?

Increasing k_R results in a cost to the President of increased policy bias, but benefits the President by increasing Agency effort (through its effect on the Agency's policy payoff). So to determine whether regulatory review increases or decreases policy bias, we need to know which effect is bigger. So long as the elasticity of the Agency's supply of effort with respect to its policy payoff does not increase with effort (Assumption 1, which we think is the more realistic case), the benefit from increased effort is always smaller than the cost in terms of policy bias, so that in equilibrium, regulatory review results in less policy bias.

3. Historical Examples

Our simple baseline model predicts that presidents will appoint relatively pro-regulatory agency staff in order to better motivate the agency to pursue regulatory opportunities but subject those agencies' decisions to review by a more aligned bureaucrat. To illustrate, consider two historical examples from the 1970s that can be interpreted through the lens of our theory: the revitalization of the Federal Trade Commission (FTC) and the creation of the EPA with a corresponding increase in centralized regulatory review.

3.1. **The Federal Trade Commission.**

Created by Congress in 1914, the FTC is responsible for administering both antitrust laws and more general consumer protection laws. By statute the FTC is an independent agency outside of the direct control of the president, so this case should be thought of as entailing full delegation to the agency to set policy.

By 1969, the FTC was widely regarded as a moribund agency. Spurred by two reports critical of the FTC, one by the Nader organization[12] and the other by the American Bar Association,[13] in the fall of that year President Nixon announced that "the time has now come for the reactivation and

[12]Cox, Fellmeth, and Schulz (1969). The Nader Report revealed an organization that was passive and ineffective, relying on reports from consumers to detect violations and rarely bringing enforcement actions, and used by congressmen as a source of patronage employment.

[13]American Bar Association (1969).

revitalization of the FTC."[14] Nixon cited in particular the need for more effort to identify regulatory opportunities, stating that the FTC "should seek out new information on consumer problems through more energetic field investigations."[15]

Key to Nixon's approach was the appointment of Casper Weinberger as Chairman of the FTC. Nixon reported that Weinberger had "assured me that he intends to initiate a new era of vigorous action."[16] Personnel was a major focus during Weinberger's brief six-month chairmanship, during which he discharged 18 of the top 31 staff member at the FTC.[17] Nixon appointed Miles Kirkpatrick to succeed Weinberger, who continued the focus on personnel, replacing about a third of the mid- and lower-level staff with new people who had a "strong commitment to consumer protection."[18] As a result, the ideology of the FTC staff became dramatically more pro-consumer protection, with many FTC staff members decidedly more pro-consumer protection than Nixon. For example, Kirkpatrick, with the consent of the Nixon White House, appointed two "card-carrying activist Democrats" to the high-level FTC posts of Director of the Bureau of Consumer Protection and Director of the Bureau of Economics.[19]

The revamped FTC dramatically increased its enforcement and regulatory activities. The first stage of this expansion, from 1970 to 1975, entailed more aggressive case-by-case enforcement against unfair and deceptive business practices.[20] The second stage began in 1975, when Congress expressly delegated to the FTC the authority to issue industry-wide rules to regulate unfair and deceptive industry practices.[21] Prior to this legislation, the FTC's legal authority to promulgate industry-wide rules was widely doubted and only sparingly asserted.[22] The FTC used the authority

[14]President Nixon, Special Message to the Congress on Consumer Protection, Oct. 30, 1969.
[15]*Ibid.*
[16]*Ibid.*
[17]Clarkson and Muris (1981, p. 4).
[18]Harris and Milkis (1996, p. 167).
[19]Senate Committee on Government Operations, Study on Federal Regulation: The Regulatory Appointments Process, vol. 1, p. 217, S. Doc. No. 25, 95th Cong., 1st Sess. (1977).
[20]Harris and Milkis (1996, p. 181)
[21]Magnuson-Moss Warranty - FTC Improvement Act of 1975, Jan. 4, 1975, Pub. L. 93-637, 88 Stat. 2193.
[22]The first judicial recognition of the FTC's authority to issue industry-wide rules came in National Petroleum Refiners Ass'n v. FTC, 482 F. 2d 672 (D.C. Cir. 1973), which upheld an FTC rule issued in 1971 requiring octane ratings to be posted on gasoline pumps.

granted it under the statute to propose rules regulating numerous industries, including eyeglasses, franchising, used cars, mobile homes, and vocational schools.

The congressional record supports the interpretation that the appointment of more pro-regulatory agency personnel was meant to spur more regulatory effort at the FTC. At the confirmation hearing of Lewis Engman, Kirpatrick's successor as chairman of the FTC, Republican Senator Norris Cotton said that the FTC "has had a need for some kind of injection to pep it up so it would fulfill its mission."[23] Ted Stevens, Republican Senator from Alaska, told Engman, "I am really hopeful that ... you will become a real zealot in terms of consumer affairs and some of these big business people will complain to us that you are going too far. That would be the day, as far as I am concerned."[24]

But while the FTC was certainly more activist than prior to the overhaul initiated by Nixon, consumer advocates criticized the FTC for failing to become "a real zealot in terms of consumer affairs."[25] That changed in 1977, when President Carter, at the recommendation of Ralph Nader, appointed an even more pro-regulatory FTC chairman in Michael Pertschuk, prompting *Fortune* magazine to report, "Nader's invaders were inside the gates."[26] Under Pertschuk, the FTC put greater emphasis on hiring committed consumer advocates onto the staff. For example, Harris and Milkis (1996, p. 178) quotes an FTC attorney as saying,

> [W]ho is better, a 4.0 graduated from Harvard who engaged in no public service programs, or a 3.85 graduate from Harvard who ran the legal aid program or was otherwise actively involved in proconsumer programs. Under Chairman Pertschuk, I am confident the latter would have been chosen.

Many of the regulatory actions taken under Pertschuk were initiated under previous Republican appointed chairmen, but FTC policy under Pertschuk was decidedly more activist than under his predecessors.[27] The most controversial rulemaking proceeding in the period entailed a proposal to

[23]Nomination of Lewis A. Engman, To Be a Commissioner, Federal Trade Commission: Hearings Before the Senate Comm. On Commerce, 93d Cong., 1st Sess. 4 (1973).
[24]*Ibid.*
[25]U.S. Congress, Senate, Committee on Commerce, 1974. Federal Trade Commission Oversight. 93rd Cong., 2d sess., March 1, 7, 14; May 9.
[26]Harris and Milkis (1996, p. 155).
[27]Harris and Milkis (1996, p. 177)

restrict television advertisements aimed at children. The proposal created a backlash against the FTC, ultimately leading to Congressional action to curtail the agency.

3.2. **The Environmental Protection Agency and regulatory review.** The creation of the EPA and the attendant development of centralized regulatory review by the White House further illustrate our theory. In 1969 a White House task force recommended to President Nixon that responsibility for environmental protection and natural resources management be combined in a new Department of Natural Resources.[28] In response, Nixon charged his Advisory Council on Executive Organization, better known as the Ash Council, to come up with a detailed proposal. The staff of the Ash Council believed that combining environmental regulation with natural resources management would result in less vigorous protection of the environment, since the concerns of environmentalists would be overwhelmed by better organized natural resource developers. In contrast, a single-mission agency would be a more single-minded advocate for pollution control.[29] Such a concern is consistent with our theory—agency bias is most effective at mitigating shirking when the agency has a relatively focused mission and not multiple missions that are frequently at odds. Persuaded in part by this concern,[30] Nixon adopted the Ash Council's proposal and created the EPA by executive order on July 9, 1970.[31]

Nixon appointed William Ruckelshaus, an attorney from the Department of Justice, to be the first Administrator of the EPA. Ruckleshaus had worked on environmental actions at the state level earlier in his career, but was largely an unknown to both industry and environmentalists at the time of his appointment. At his confirmation hearing, Ruckleshaus was asked whether he would resolve statutory ambiguities in favor of "the environmental view." He replied, "that is ... precisely what

[28]Marcus (1980, p. 31).

[29]Marcus (1980, pp. 34-37). This view was echoed by Senator Edmund Muskie, who argued, "If the control of pollution is assigned to those responsible for the promotion of polluting activities at the same time, we compromise our goal of environmental protection. ... The agency which sets environmental quality standards must have only one goal—protection of this and future generations against changes in the natural environment which adversely affect the quality of life." Statement of Senator Edmund Muskie, Reorganization Plan No. 3, Creating the Environmental Protection Agency, Before the Subcommittee on Government Organization, Senate Committee on Government Operations, July 28, 1970.

[30]Whitaker (1976, p. 55).

[31]Reorganization Plan No. 3 (35 F.R. 15623, 84 Stat. 2086).

I would intend to do."[32] Ruckleshaus quickly established his environmentalist bona fides with an aggressive campaign of enforcement of existing environmental laws against polluters,[33] leading the *New York Times* to refer to him as the "house liberal" in the Nixon Administration.[34]

Ruckleshaus's aggressive policies soon brought him into conflict with the White House. One of the most controversial policy areas was the EPA's implementation of the 1970 Clean Air Act. The law was designed to force the EPA to take aggressive steps to reduce air pollution and achieve "healthy air" by 1975 by mandating specific short-term deadlines for the agency to issue rules and by prohibiting the EPA from considering economic costs in its rule setting. In April 1971 the EPA circulated draft guidelines for states in formulating their implementation plans for the air quality standards set by the EPA under the Act. To force the EPA to consider economic costs in its policymaking under the Act, in May 1971 the director of the Office of Management and Budget (OMB) George Shultz sent Ruckleshaus a letter informing him that EPA regulations had to be cleared through OMB and other agencies before being issued.[35] The following month, OMB asserted that authority by preventing EPA from publishing its guidelines in the Federal Register. Following completion of OMB review, the final guidelines published in August gave states more flexibility in implementing the air quality standards and directed states to consider the economic impact of their implementation plans.[36]

Soon after Nixon's reelection in 1972, Nixon decided to retain Ruckleshaus as Administrator, but Ruckleshaus stipulated as a condition of staying that Nixon revise the system of OMB review to clarify that EPA had final authority over regulatory decisions.[37] While Nixon agreed, the OMB

[32]Nomination of William D. Ruckleshaus, Hearings Before the Committee on Public Works, United States Senate, 91st Cong. Second Session, Dec. 1 and 2, 1970.
[33]Marcus (1980, pp. 88-90).
[34]*New York Times*, "Government's Pollution Fighter," April 12, 1973.
[35]Marcus (1980, p. 125).
[36]This sequence of events was recounted at a Senate hearing called over the controversy, at which Ruckleshaus insisted that he made the final call on the modifications. Implementation of the Clean air act amendments of 1970 (title I). Hearings before the Subcommittee on Air and Water Pollution of the Committee on Public Works, U.S. Senate, Ninety-second Congress, second session, Feb. 16, 17, 18, and 23, 1972. U.S. Government Printing Office, Washington, DC.
[37]Quarles (1976, p. 118)

review process continued and OMB successfully pressured EPA to modify rules in response to White House concerns.[38]

Subsequent presidents continued the practice of OMB review of executive agencies' proposed rules. President Reagan further formalized the process by executive order and expressly authorized OMB to block regulations by directing agencies to "refrain from publishing" proposed rules until OMB's review was concluded.[39] Responsibility for coordinating the regulatory review process was lodged in the Office of Information and Regulatory Affairs (OIRA) within OMB. When President Clinton took office in 1993, many expected him to terminate the OIRA review process. Instead, he continued the regulatory review regime with a few minor changes, and the institution of OIRA review continues to this day.

Why do presidents from both parties find OIRA review useful when they could instead simply appoint agency heads who share the president's policy preferences? In the case of the Ruckleshaus, for example, Nixon could have could have used a different strategy for controlling the EPA: appoint an EPA Administrator who shared Nixon's policy preferences.

Our theory offers an explanation: presidents prefer to appoint a relatively biased agency head in order to mitigate shirking by the agency, and this use of agency bias creates a role for regulatory review in reducing the consequent bias to the intensive margin of policy. In the case of Ruckleshaus, Nixon wanted energetic effort out of the EPA and achieved it by appointing an agency head who put relatively large weight on the benefits of environmental regulation. The OMB review process helped keep in check the resulting bias in EPA's specific rule proposals.

4. Extensions

In our baseline model above, we abstracted from a number of important issues. We turn now to two issues that can moderate or reverse the prediction of our baseline model that presidents will choose relatively pro-regulatory agency staff. First, we consider the possibility that a biased Agency will manipulate the information available to the Reviewer. Second, we consider the case

[38]For example, Quarles (1976, pp. 117-142) recounts an episode in which OMB officials successfully pressured the EPA to delay the target date of new regulations restricting the lead content of gasoline in 1973.

[39]Exec. Order 12,291 § 3(f), 46 Fed. Reg. 13,193 (Feb. 17, 1981).

in which the President wants to identify opportunities to change *existing* regulations as well as to create new regulations.

4.1. **Asymmetric information and regulatory review.** In our baseline model, we assumed that there is no uncertainty about the benefits of a regulatory opportunity once the Agency discovers it. Suppose now that the Agency has private information about the marginal benefit of a regulatory opportunity. The idea that bureaucrats have an informational advantage over those who delegate to them is central in the study of bureaucratic politics (Niskanen, 1975; McCubbins, Noll, and Weingast, 1987; Stephenson, 2011). Relative to this literature, our contribution is in considering how this information asymmetry affects the president's selection of agency bias.[40] We show that the risk that the agency will strategically withhold information curbs the president's willingness to appoint extreme agencies.

4.1.1. *Setup.* To be concrete, suppose that if the Agency finds a regulatory opportunity, it is one of two types: it is a high value opportunity with marginal benefit B_H with probability q and a low-value opportunity with marginal benefit B_L with probability $1-q$, with $0 < B_L < B_H$. However, the Agency only learns what type the opportunity is with probability p. Moreover, suppose that, if the Agency learns what the marginal benefit is, he can choose whether to disclose this information to the Reviewer. We assume that the Agency can credibly disclose the true B, but that if the Agency hides B, the Reviewer does not know whether the Agency knows B.

The sequence of moves in the model is now:

1. Agency chooses search effort e.
2. With probability e, Agency finds a regulatory opportunity (if not, game ends).
3. Nature chooses marginal benefit B of the regulatory opportunity.
4. With probability p, Agency learns B.
5. Agency chooses whether to propose a rule to the Reviewer (if not, game ends).

[40] Dessein (2002) considers a different, but related, problem, in which the principal takes the agent's ideology as given, but can choose the ideology of the supervisor to induce revelation. In his model, allowing the principal control over both ideologies would be uninteresting, since there is no effort dimension, so the principal would always simple choose someone like himself. We allow the principal control over both, but with an effort-policy tradeoff.

6. If Agency knows B, he chooses whether to disclose B to Reviewer.
7. Reviewer chooses stringency s.

Our equilibrium concept is perfect Bayesian equilibrium (PBE).

4.1.2. *Stringency, disclosure, and search effort.* To find the equilibrium, we start with the Reviewer's choice of stringency. If the Agency has conveyed the marginal benefit of the regulatory opportunity to the Reviewer, then the Reviewer's choice problem is,

$$\max_{s \geq 0} \gamma \left[k_R B s - \frac{s^2}{2} \right], \tag{12}$$

where the marginal benefit is denoted $B \in \{B_L, B_H\}$. Note that the Reviewer's objective function is linear in B so that, if B is uncertain, all that matters to the Reviewer is the expected value of B. If the Agency has not disclosed the marginal benefit, then the Reviewer will form beliefs about the marginal benefit that are, in equilibrium, consistent with the Agency's disclosure strategy. Hence, (12) is also the Reviewer's problem in the subgame in which the Agency has not disclosed the marginal benefit, but now B denotes the expected marginal benefit based on the Reviewer's beliefs. The solution to this problem is $s^*(k_R, B) = k_R B$.

Now consider the Agency's disclosure strategy, for now taking the preference parameters k_A and k_R as exogenous. We begin by considering the conditions under which there is a *full-disclosure* equilibrium in which the Agency always discloses any information he obtains. A full-disclosure equilibrium exists if and only if the Agency receives a higher payoff when he discloses than when he hides, both when he observes B_L and when he observes B_H.

Consider for example a full-disclosure equilibrium for the case in which $k_A > k_R$. Suppose that the Agency observes B_L. If he discloses, then the Reviewer will select stringency $k_R B_L$, which is lower than the Agency's preferred stringency, $k_A B_L$. If instead he deviates by hiding this information, then the Reviewer would believe that the Agency did not observe the marginal benefit and hence that the opportunity has expected marginal benefit $\overline{B}$. Thus the Reviewer would choose a higher stringency, $k_R \overline{B} > k_R B_L$. For this deviation not to be attractive to the Agency, hiding must result in the Reviewer overshooting by selecting a stringency that is *above* the Agency's

ideal stringency for B_L. In fact, this implemented stringency must be so far above the Agency's ideal that the Agency prefers the too-low stringency chosen when he tells the truth. Hence it is easier to maintain disclosure as $B_H - B_L$ grows, since hiding B_L would induce a bigger jump in stringency, leading to overshooting for a larger set of preference parameters k_A and k_R. Of course, with $k_A > k_R$ the Agency never has incentive to hide B_H. The case in which $k_A < k_R$ is similar but the relevant incentive constraint applies to hiding B_H instead of B_L.

Analysis of these two incentive constraints yields constraints on how far apart the policy preferences of the Agency and the Reviewer can be for a full-disclosure equilibrium to exist, which are summarized in the following lemma.

Lemma 2. *A full-disclosure equilibrium exists if and only if* $k_R - \frac{k_R(1-q)}{2}\frac{B_H-B_L}{B_H} \leq k_A \leq k_R + \frac{k_R q}{2}\frac{B_H-B_L}{B_L}$.

Let $\overline{k}(k_R) \equiv k_R + \frac{k_R q}{2}\frac{B_H-B_L}{B_L}$ represent the highest value of k_A, given k_R, for which the full-disclosure equilibrium exists, given in Lemma 2. For the rest of this section, we assume that $\overline{k}(k_R^*) < k^{max}$, since otherwise the information asymmetry has no bite since the President could always implement the outcome she would implement if information were symmetric.

The value to the Agency of finding a regulatory opportunity in a full-disclosure equilibrium is given by,

$$
\begin{aligned}
V^{disc}(k_A, k_R) =& \gamma\Big[qp[k_A B_H s^*(k_R, B_H) - \frac{s^*(k_R, B_H)^2}{2}] + \\
& (1-q)p[k_A B_L s^*(k_R, B_L) - \frac{s^*(k_R, B_L)^2}{2}] + \\
& (1-p)[k_A \bar{B} s^*(k_R, \bar{B}) - \frac{s^*(k_R, \bar{B})^2}{2}]\Big] \qquad (13) \\
=& \gamma\big[k_A k_R - \frac{k_R^2}{2}\big]\big[p[qB_H^2 + (1-q)B_L^2] + (1-p)\bar{B}^2\big] \\
=& \gamma\big[k_A k_R - \frac{k_R^2}{2}\big]\big[\bar{B}^2 + pq(1-q)(B_H - B_L)^2\big].
\end{aligned}
$$

The Agency thus chooses search effort to satisfy $\psi'(e) = V^{disc}(k_A, k_R)$.

If a full-disclosure equilibrium does not exist, then the only equilibrium that exists is a *hiding* equilibrium in which the Agency hides information about one of the two states. Since (as we show below) the President will choose an Agency with relatively high k_A, much as in the baseline model, the relevant case is $k_A > k_R$, in which case the only possible hiding equilibrium is one in which the Agency hides B_L. Because they are not reached on the equilibrium path, for brevity we omit discussion of subgames with $k_A < k_R$.

Denote the Reviewer's beliefs in such an equilibrium about the probability that $B = B_H$ in the subgame in which the Agency does not disclose by $\hat{q}$, with corresponding expected marginal benefit $\hat{B}$. The Reviewer's equilibrium beliefs are given by Bayes' Rule:

$$\hat{q} \equiv \frac{q(1-p)}{(1-p)+p(1-q)} < q. \tag{14}$$

The Agency's expected policy payoff from finding a regulatory opportunity is thus given by,

$$\begin{aligned} V^{hide}(k_A, k_R) &= \gamma\Big[qp[k_A B_H s^*(k_R, B_H) - \frac{s^*(k_R, B_H)^2}{2}]+ \\ &\quad (1-qp)[k_A \hat{B} s^*(k_R, \hat{B}) - \frac{s^*(k_R, \hat{B})^2}{2}]\Big] \\ &= \gamma\Big[k_A k_R - \frac{k_R^2}{2}\Big][qpB_H^2 + (1-qp)\hat{B}^2] \\ &= \gamma\Big[k_A k_R - \frac{k_R^2}{2}\Big][\overline{B}^2 + \frac{qp(1-q)^2}{1-qp}(B_H - B_L)^2]. \end{aligned} \tag{15}$$

The Agency chooses search effort to satisfy $\psi'(e) = V^{hide}(k_A, k_R)$.

For parameter values for which both the full-disclosure equilibrium and this hiding equilibrium exist, the full-disclosure equilibrium Pareto-dominates the hiding equilibrium for the Agency, Reviewer, and President. First, observe that $V^{disc}(k_A, k_R) > V^{hide}(k_A, k_R)$. This implies that the Agency's search effort is higher in the full-disclosure equilibrium, and that the Agency is better off in the full-disclosure equilibrium. Furthermore, the policy payoffs to the Reviewer and to the President from the Agency finding a regulatory opportunity are the same functions $V^{disc}(k_A, k_R)$

and $V^{hide}(k_A, k_R)$ but with k_R and k_P, respectively, substituted for the first argument of the functions. Therefore this implies that the Reviewer and the President are also better off in the full-disclosure equilibrium than in the hiding equilibrium.[41] Because the full-disclosure equilibrium Pareto-dominates the hiding equilibrium, we will assume that the full-disclosure equilibrium is played if it exists.[42]

4.1.3. *Agency bias.* With this characterization of the equilibrium play in the Reviewer-Agency subgames in hand, let us turn finally to the President's choice of k_A and k_R. Let k_A^{**} and k_R^{**} denote the President's equilibrium choice of the type of Agency and Reviewer, respectively. The following proposition summarizes the equilibrium under asymmetric information.

Proposition 3. *Equilibrium under asymmetric-information.*

(1) Assume that Assumption 1 holds. Holding $\overline{B}$ fixed, for k^{max} sufficiently large, there exists a unique threshold $T > 0$, such that:

(a) (Hiding) If $B_H - B_L < T$, then the President appoints a maximally biased Agency, $k_A^{**} = k_A^* = k^{max}$, and a Reviewer who is more pro-regulatory than she is, but not maximally pro-regulatory, $k_P < k_R^{**} < k^{max}$. The Agency hides the marginal benefit when it is equal to B_L.

(b) (Full Disclosure) If $B_H - B_L > T$, then the President appoints an Agency who is indifferent about whether to disclose the marginal benefit for low marginal benefit opportunities, $k_A^{**} = \overline{k}(k_R^{**})$, and a Reviewer who is more pro-regulatory than she is, but less pro-regulatory than the Agency, $k_P < k_R^{**} < k_A^{**}$. The Agency always discloses B.

(2) This T is decreasing in k_P and increasing in $\overline{B}$.

[41] It is also the case that for $k_A < k_R$ (a case we omit because it is not on the equilibrium path), the full-disclosure equilibrium Pareto-dominates the hiding equilibrium (in this case hiding B_H).

[42] Mixed strategy equilibria, in which the Agency mixes between hiding and disclosing for one value of the marginal benefit, exist for some parameter values. But whenever a mixed strategy equilibrium exists, so does a full-disclosure equilibrium, which Pareto-dominates it. We similarly assume that in such cases the Agency and Reviewer play the full-disclosure equilibrium.

(3) The President strictly prefers a regulatory process that includes regulatory review to full delegation to the Agency.

Part (1)(a) of the proposition shows that when there is relatively little information asymmetry between the Agency and the Reviewer about the benefits of regulation after the Agency proposes a rule ($B_H - B_L$ is small), then the President chooses an extreme pro-regulatory Agency. But unlike in the baseline model with regulatory review, the incentive effect of Agency bias comes at a cost. This cost is different than the cost in the full delegation case, namely, here appointing an extreme Agency results in a loss of information that would help to fine-tune regulation. Conflict and deception in the Agency and Reviewer relationship, in this model, are avoidable, but in this area of the parameter space the President (second-best) optimally chooses not to avoid it.

The President only chooses bureaucrats who will fail to communicate when the cost associated with the loss of information is small. If the asymmetric information is important ($B_H - B_L$ is large), then part (1)(b) of the proposition shows that the President will forgo the extra effort he might get by appointing a very extreme Agency and instead choose an Agency more in line with the Reviewer in order to guarantee disclosure. Large $B_H - B_L$ makes inducing disclosure more attractive to the President for two reasons. First, the asymmetric information about the true state is more valuable as that information has a bigger effect on the preferred stringency. When $B_H - B_L$ is large, there is a large gap between the preferred stringency in each state. Second, as $B_H - B_L$ grows it actually becomes easier to induce full disclosure (in the sense that the maximum gap between the Agency's and Reviewer's preferences under which full disclosure is an equilibrium grows).

Part (2) of the proposition implies that there will be less conflict between OIRA and the proposing agency, and in particular less manipulation of information by the agency, when the president is more pro-regulatory over the agency's domain. Thus, one might think that a Republican president will get more disclosure from national security agencies, while Democrats will get more disclosure from the EPA.

Furthermore, T increasing in $\overline{B}$, along with part (1) of the proposition, implies that we will observe more extreme appointments to agencies, and more conflict between the agency and OIRA, when finding regulatory opportunities is particularly important relative to the importance of the asymmetric information about the regulatory opportunity that remains after the Agency proposes a rule. A range of institutions serve to reduce this information asymmetry and thus, according to our model, encourage the use of agency bias as a motivational instrument. For example, the Administrative Procedure Act provides interested parties notice of rulemaking and an opportunity to comment on proposed rules and requires agencies to state the "basis and purpose" for their decisions[43] and thereby reduces the information asymmetry between the agencies and OIRA. Similarly, one way of understanding the reason that OIRA requires agencies to provide cost-benefit analysis with their rules is as a way of forcing the agency to disclose information (Posner, 2001). For domains in which these institutions are effective, we expect to see presidents appointing particularly biased agency staff and subjecting their decisions to more centrist bureaucrats at OIRA. In contrast, for domains in which information asymmetry is more important, presidents can be expected to appoint less biased agency staff. These may include domains in which regulatory issues are highly technical and for which there are not many competing interest group who can reduce the information asymmetry by providing information.

Finally, the introduction of information asymmetry does not change the fact that the President prefers to employ regulatory review. To see this, note that the President could still recreate the full-delegation outcome here by choosing $k_A = k_R$, since the Agency gains nothing from hiding information when the Reviewer exactly shares his policy preferences. The President never makes that choice, so she must be strictly better off with regulatory review. The reasons regulatory review is useful are the same as in the baseline model.

4.2. **Deregulation.** In our baseline model, the President is born into a regulatory vacuum and thus can only move regulatory policy in one direction—increased regulation. Suppose instead that there is a stock of extant regulations.

[43] 5 U.S.C. § 551 *et seq.*

4.2.1. *Setup.* For simplicity, assume that there is a single existing environmental regulation with marginal benefit B_O, which was set according to the preference parameter k_O, so that its current stringency is $s_O^*(k_O) = k_O B_O$ (the subscript O stands for "old").

If $k_P \neq k_O$ then the President knows she would like to change existing regulations. To focus on the more interesting case, we assume that $k_P < k_O$ so that the President would like to *deregulate* ($k_P \geq k_O$ results in a model not significantly different from the baseline model). But suppose that changing regulations requires additional information. For example, the precise regulations that can be usefully revised may be unknown, or changing stringency may require additional information.

The President must delegate to an Agency the task of searching for a deregulatory opportunity. In particular, to generate a probability e_O of identifying an appropriate deregulatory opportunity, the Agency must bear a cost $\psi_O(e_O)$, with $\psi_O'(0) = 0$, $\psi_O''(\cdot) > 0$, and $\lim_{e_O \to 1} \psi_O'(e_O) = \infty$. If the Agency finds an opportunity, he can propose a rule to the Reviewer, who then chooses stringency, s_O.[44]

This same Agency remains responsible for searching for new regulatory opportunities, modeled as in the baseline model. The search and stringency decisions for resetting the old regulation occur simultaneously with the decisions regarding the new regulation. Otherwise, the timing is identical to the baseline regulatory review model in section 2.3 above. This change results in a multi-task principal-agent problem (Holmstrom and Milgrom, 1991). As before, the President's problem is to choose the preferences of the Agency and Reviewer, represented by k_A and k_R, but she now maximizes the sum of the policy payoffs from the two tasks.

4.2.2. *Stringency and search effort.* Beginning with the stringency choice of the Reviewer, if the Agency proposes a new regulation, the Reviewer sets stringency at $s^*(k_R) = k_R B$. Similarly, if the Agency proposes deregulation, the Reviewer sets stringency at $s_O^*(k_R) = k_R B_O$.

[44]For brevity, we only explicitly model the case with regulatory review; the full-delegation case is a straightforward extension.

Given this stringency setting strategy, the Agency receives the following payoff from finding a regulatory opportunity,

$$V(k_A, k_R) = \gamma B(k_A k_R - \frac{k_R^2}{2}), \tag{16}$$

and the following payoff from finding a deregulatory opportunity,

$$V_O(k_A, k_R) = \gamma B_O[(k_A k_R - \frac{k_R^2}{2}) - (k_A k_O - \frac{k_O^2}{2})]. \tag{17}$$

Faced with these policy outcomes, the Agency chooses search effort for each of the two tasks to solve,

$$\max_{(e,e_O)\in[0,1]^2} eV(k_A, k_R) - \psi(e) + e_O V_O(k_A, k_R) - \psi_O(e_O). \tag{18}$$

Denote the solution, as a function of k_A and k_R , by $e^*(k_A, k_R)$ and $e_O^*(k_A, k_R)$.

4.2.3. *Agency bias.* Finally, consider the President's choice of k_A and k_R. She solves the following problem:

$$\max_{(k_A,k_R)\in[0,k^{max}]^2} e^*(k_A, k_R)V(k_P, k_R) + e_O^*(k_A, k_R)V_O(k_P, k_R). \tag{19}$$

As before, let (k_A^*, k_R^*) denote the solution to this problem.

Because $k_P < k_O$ there is a conflict between the two tasks. The President wants the Agency to work hard to uncover deregulatory opportunities. With an optimally chosen Reviewer in place, the President gets more effort from the Agency on the deregulatory task the lower k_A is. A less pro-regulatory Agency gains more from resetting the stringency of an over-stringent regulation than a more pro-regulatory agency does. But the President also cares about new regulatory opportunities. The Agency works harder to find new regulatory opportunities the higher k_A is, as before. The following proposition characterizes how the President resolves this tradeoff.

Proposition 4. *Equilibrium with both regulatory opportunities and deregulatory opportunities.*

(1) The equilibrium Agency preference decreases as deregulation becomes more important, $\frac{\partial k_A^*}{\partial B_O} \leq 0$. *Furthermore, there exists a threshold level* B_O^* *such that for* $B_O > B_O^*$ *the President prefers to appoint a relatively anti-regulatory Agency,* $k_A^* < k_P$. *Otherwise, the President prefers a pro-regulatory Agency,* $k_A^* \geq k_P$.

(2) A more pro-regulatory Agency is selected as the President becomes more pro-regulation or the old regulations get less extreme, i.e., $\frac{\partial k_A^*}{\partial k_P} > 0$, $\frac{\partial k_A^*}{\partial k_O} < 0$.

(3) The President appoints a Reviewer with preferences strictly between her own and the Agency's.

Part (1) of the proposition shows that the presence of deregulatory opportunities can moderate the result from our baseline model that the President prefers to appoint an extremely pro-regulatory agency. $B_O = 0$ reproduces the baseline model. The more important these deregulatory opportunities are, the less pro-regulatory an Agency the President appoints. For a sufficiently important deregulatory opportunity, the President will select an Agency who is less pro-regulatory than herself.

Similarly, part (2) of the proposition implies that as the President's deregulatory motive gets stronger, either because the President is less pro-regulatory (lower k_p) or the extant regulations are more extreme (higher k_O), the President prefers to appoint a less pro-regulatory Agency.

Finally, part (3) shows that the President will continue to prefer a relatively centrist Reviewer to moderate the bias on the intensive margin of policy caused by a biased Agency. The Reviewer is not perfectly aligned with the President for the same reason as in the baseline model—tilting the Reviewer toward the Agency has a beneficial incentive effect that outweighs its cost in terms of policy bias.

This extension of the model suggests several empirical implications. First, the shirking problem results in an amplification of both partisan conflict over regulation and the cycling of regulatory policy. To see this, suppose that a president enters office with relatively pro-regulatory preferences in some domain with an extant stock of regulation such that the president wants to move policy towards more stringent regulation. Because the president faces an agency that will shirk, under our

theory the president will want to appoint a relatively pro-regulatory agency, since such an agency will shirk less. Moreover, the president will appoint a reviewer who is more aligned with the president but still biased towards regulation. The result of this strategy, however, is that the policies set by the agency and reviewer will be even more stringent than the president prefers. Moreover, as modeled in section 4.1 above, imperfections in the review process such as asymmetric information may cause policy to be set even more stringent than the reviewer prefers.

The resulting regulations are far more stringent than the members of the competing political party, with a platform that is relatively anti-regulatory over the same domain, would prefer. Regulatory policy thus becomes a salient political issue, and party leaders decry the "over-regulation" of the incumbent administration. Suppose this competing party wins the next presidential election, installing a relatively anti-regulatory president. The anti-regulatory president wants to move regulatory policy to become less stringent. But this president also faces a problem of shirking at the agency. So to motivate the agency to deregulate, he appoints a relatively anti-regulatory agency, who will work hard to deregulate but, together with an optimally chosen reviewer, will set policy even looser than the president prefers. This makes regulatory policy a salient issue in the next round of electoral politics. And so forth.

If presidents did not face this shirking problem—or did not use biased preferences of agencies to mitigate it—the swings of regulatory policy would be smaller in amplitude. The use of zealots as a way to mitigate shirking results in higher variance in regulatory policy and heightens the role of regulatory policy in electoral politics. Interestingly, effective regulatory review can dampen the swings of policy, but will *amplify* the swings of preferences at the agencies. While reviewers are chosen to be more aligned than are agencies under full delegation, the agencies are chosen to be more extreme when regulatory review is employed.

Second, our theory provides a microfoundation for, and modification to, the "life cycle" theory of agencies. Downs (1967, p. 5) argues that new agencies are "initially dominated either by advocates or zealots." But as an agency ages, zealots become less important and bureaucrats more concerned with job security and stability assume control. The result is that the agency becomes less focused on performing its social function.

In our theory, new agencies will also be led by zealots. However, over time as the agency creates a stock of rules that are more stringent than the appointing president would prefer, a potential deregulatory motive grows. Combining this life cycle dynamic with the partisan dynamics described above, this deregulatory motive can be triggered when a president from the party that puts relatively less weight on the agency's regulatory objective is elected. Such a president may then appoint a "deregulatory zealot," in order to incentivize the agency to identify deregulatory opportunities and reset the stringency of the stock of agency rules.

These dynamics implied by our theory may explain some historical episodes of deregulation, for example at the beginning of the Reagan administration. [DISCUSS REAGAN-ERA DEREGULATION.]

5. Conclusion

Our goal in this paper has been to provide an account of why presidents appoint agency staff with policy preferences more extreme than the president's and subject their policy decisions to review by a more aligned bureaucrat and to analyze its implications. While our primary goal is descriptive, we conclude by suggesting a few implications of our analysis for the debate over the normative desirability of regulatory review.

The traditional justification for centralized regulatory review is that it keeps in check the inherent bias of agencies toward their mission. On this account, "an agency succeeds by accomplishing the goals Congress set for it as thoroughly as possible —- not by balancing its goals against other, equally worthy goals" (DeMuth and Ginsburg, 1986, p. 1081). Relatedly, "capture" of regulatory agencies by special interest groups creates another source of bias, and OIRA is viewed as less vulnerable to such influence. In a recent paper, Livermore and Revesz (2012) provide a detailed analysis of the features of OIRA that insulate it from capture, pointing in particular to its generalist jurisdiction.[45]

[45]But the authors argue that OIRA review has in practice been biased against regulation and propose reforms that would make OIRA play an anti-capture role that would correct rules that favor special interest groups (whether they be pro-regulatory or anti-regulatory) at the expense of the broader public interest.

A second justification for OIRA review focuses on the value of presidential control rather than on specifically either a need to check overzealous agencies or to correct for agency capture. Kagan (2000) argues that OIRA review facilitates presidential control over the administrative state. Under her view, presidential control of the bureaucracy enhances the democratic legitimacy of bureaucratic decisionmaking because the president is elected by a national constituency. Moreover, because the president is a unitary actor in a central position within the regulatory state, presidential control results in more rational, cost-effective, and consistent bureaucratic decisionmaking.

But critics of regulatory review argue that the institution in practice has been systematically biased against regulation.[46] For example, they observe that changes made to rules during OIRA review tend to reduce the stringency of regulations,[47] and that OIRA only reviews agency decisions to act, not agency decisions not to act.[48] Moreover, critics argue that there is no compelling theory or evidence to support the hypothesis that agencies are overzealous in pursuit of their missions and therefore need to be checked via centralized review.[49]

Furthermore, critics of the presidential control justification for OIRA review point out that the appointments power enables presidents to choose loyalists to head agencies, leaving little role for OIRA review in furthering presidential control.[50] In addition, presidents and their senior staff only rarely directly intervene in agency rules under OIRA review.[51]

In our view, centralized regulatory review is fundamentally about presidential control over the administrative state. As influentially argued by Moe (1985), presidents have strong political incentives to assert control over agencies and have instituted OIRA review as part of a set of strategies to achieve some measure of such control. The fact that every president since Nixon has retained centralized regulatory review is strong evidence that such review furthers presidential objectives. Other social benefits of OIRA review, such as checking overzealous or captured agencies, are a

[46] *See, e.g.,* Morrison (1985); Percival (1991).
[47] Bressman and Vandenbergh (2006).
[48] Bagley and Revesz (2010).
[49] *Id.*
[50] Livermore and Revesz (2012, p. 13).
[51] Livermore and Revesz (2012, p. 14) argue that "for the vast majority of OIRA's work—the bulk of the regulatory iceberg that is submerged below the gaze of the President or other senior political officials—the presidential power justification for OIRA review is largely irrelevant."

product of the ways that presidents have employed regulatory review to achieve their policy and political objectives and thus are, in a sense, epiphenomenal.

Moreover, our analysis highlights difficulties with some of the arguments made against the presidential control view. The primary channels of presidential control over agency rulemaking can be grouped into two categories: (1) direct presidential policy decisions on specific rules; and (2) presidential decisions on the structure of the administrative state and its personnel. In our model, the president makes no direct policy decisions. Rather, the president achieves her policy objectives by choosing what bureaucrats to appoint and by structuring their decisionmaking process. As the model makes clear, in terms of achievement of presidential policy objectives, a system with regulatory review strictly dominates full delegation. Hence the frequency with which the president personally intervenes in rulemakings under OIRA review is not an accurate measure of the degree to which OIRA review facilitates presidential control.

Furthermore, our analysis shows that ideological conflicts between OIRA and the regulatory agencies can be useful to, and indeed are sometimes intentionally created by, the president. When the president does not have too strong a deregulatory motive, the president has an incentive to appoint pro-regulatory biased agency staff and subject them to review by a more aligned bureaucrat at OIRA. This helps explain why in practice OIRA review more often leads to a reduction rather than an increase in the stringency of agencies' proposed rules. Moreover, it also explains why OIRA is structured to review only agency action, not agency decisions not to act. In our theory, the optimal division of labor is to give more ideologically motivated staff in the agencies the responsibility to research and propose rules. The comparative advantage of more centrist staff at the center is in reviewing proposed agency action, not in researching the many ways in which the agency has chosen not to act. Because OIRA is fundamentally about presidential control, the normative debate about the desirability of OIRA review should focus on the normative attractiveness of presidential control—an important and immensely complicated issue implicating, *inter alia*, separation of powers concerns and the nature of electoral politics—not on whether OIRA review is systematically biased per se.

REFERENCES

ACS, A., AND C. CAMERON (2012): "Regulatory Auditing at the Office of Information and Regulatory Affairs," Unpublished Manuscript.

AGHION, P., AND J. TIROLE (1997): "Formal and real authority in organizations," *Journal of Political Economy*, pp. 1–29.

AMERICAN BAR ASSOCIATION (1969): *Report of the ABA Commission To Study the Federal Trade Commission*.

BAGLEY, N., AND R. REVESZ (2010): "Centralized oversight of the regulatory state," *Columbia Law Review*, 106, 1260.

BESLEY, T., AND M. GHATAK (2005): "Competition and incentives with motivated agents," *The American Economic Review*, 95(3), 616–636.

BRESSMAN, L., AND M. VANDENBERGH (2006): "Inside the Administrative State: A Critical Look at the Practice of Presidential Control," *Michigan Law Review*, 105, 47.

CALVERT, R., M. MCCUBBINS, AND B. WEINGAST (1989): "A theory of political control and agency discretion," *American Journal of Political Science*, pp. 588–611.

CLARKSON, K. W., AND T. J. MURIS (1981): *The Federal Trade Commission since 1970: economic regulation and bureaucratic behavior*. Cambridge University Press, Cambridge.

COX, E. F., R. C. FELLMETH, AND J. E. SCHULZ (1969): *The Nader report on the Federal Trade Commission*. R. W. Baron, New York.

DE MESQUITA, E., AND M. STEPHENSON (2007): "Regulatory quality under imperfect oversight," *American Political Science Review*, 101(03), 605–620.

DEMUTH, C., AND D. GINSBURG (1986): "White House review of agency rulemaking," *Harvard Law Review*, 99(5), 1075–1088.

DESSEIN, W. (2002): "Authority and communication in organizations," *The Review of Economic Studies*, 69(4), 811–838.

DEWATRIPONT, M., AND J. TIROLE (1999): "Advocates," *Journal of Political Economy*, pp. 1–39.

DOWNS, A. (1967): *Inside bureaucracy*. Little, Brown, Boston.

EDLIN, A., AND C. SHANNON (1998): "Strict monotonicity in comparative statics," *Journal of Economic Theory*, 81(1), 201–219.

GAILMARD, S., AND J. PATTY (2007): "Slackers and zealots: Civil service, policy discretion, and bureaucratic expertise," *American Journal of Political Science*, 51(4), 873–889.

GROSSMAN, S., AND O. HART (1986): "The costs and benefits of ownership: A theory of vertical and lateral integration," *The Journal of Political Economy*, pp. 691–719.

HARRIS, R. A., AND S. M. MILKIS (1996): *The politics of regulatory change: a tale of two agencies*. Oxford University Press, New York, 2nd ed edn.

HOLMSTROM, B., AND P. MILGROM (1991): "Multitask principal-agent analyses: Incentive contracts, asset ownership, and job design," *Journal of Law, Economics, & Organization*, 7, 24.

KAGAN, E. (2000): "Presidential administration," *Harvard Law Review*, 114, 2245.

LIVERMORE, M., AND R. REVESZ (2012): "OIRA, Regulatory Review, and Capture," Unpublished Manuscript.

MARCUS, A. A. (1980): *Promise and performance: choosing and implementing an environmental policy*, vol. no. 39. Greenwood Press, Westport, Conn.

MCCUBBINS, M., R. NOLL, AND B. WEINGAST (1987): "Administrative procedures as instruments of political control," *Journal of Law, Economics, & Organization*, 3(2), 243–277.

MILGROM, P., AND C. SHANNON (1994): "Monotone comparative statics," *Econometrica*, pp. 157–180.

MOE, T. (1985): "The Politicized Presidency," in *The New Direction in American Politics*, ed. by J. E. Chubb, and P. E. Peterson. Brookings Institution, Washington, D.C.

MOE, T., AND S. WILSON (1994): "Presidents and the Politics of Structure," *Law & Contemporary Problems*, 57, 1.

MORRISON, A. (1985): "OMB interference with agency rulemaking: the wrong way to write a regulation," *Harvard Law Review*, 99, 1059.

NISKANEN, W. (1975): "Bureaucrats and politicians," *Journal of Law and Economics*, 18(3), 617–643.

PERCIVAL, R. (1991): "Checks Without Balance: Executive Office Oversight of the Environmental Protection Agency," *Law & Contemporary Problems*, 54, 127.

POSNER, E. (2001): "Controlling agencies with cost-benefit analysis: A positive political theory perspective," *University of Chicago Law Review*, 68, 1137.

PRENDERGAST, C. (2007): "The motivation and bias of bureaucrats," *The American Economic Review*, pp. 180–196.

QUARLES, J. (1976): *Cleaning up America: an insider's view of the Environmental Protection Agency*. Houghton Mifflin, Boston.

STEPHENSON, M. (2007): "Bureaucratic Decision Costs and Endogenous Agency Expertise," *Journal of Law, Economics, & Organization*, 23(2), 469–498.

——— (2011): "Information Acquisition and Institutional Design," *Harvard Law Review*, 124, 1422–1829.

TIROLE, J. (1994): "The internal organization of government," *Oxford Economic Papers*, pp. 1–29.

WHITAKER, J. C. (1976): *Striking a balance: environment and natural resources policy in the Nixon-Ford years*. American Enterprise Institute for Public Policy Research, Washington.

APPENDIX

Proof of Lemma 1. Rewrite the Agency's first order condition as:

$$g(e; k_A) \equiv V(k_A) - \psi'(e) = 0. \tag{20}$$

From the implicit function theorem, the sign of $e^{*'}(k_A)$ will be the sign of $\frac{\partial g(e;k_A)}{\partial k_A}$, since the Agency's objective function is concave in e (the second order condition). We have that,

$$\frac{\partial g(e; k_A)}{\partial k_A} = \gamma k_A B^2 > 0. \tag{21}$$

□

Proof of Proposition 1. We begin by taking the derivative of the President's objective function with respect to k_A, which is equal to,

$$\left[e^{*'}(k_A)(k_P k_A - \frac{k_A^2}{2}) + e^*(k_A)(k_P - k_A)\right] B^2. \tag{22}$$

To prove part (1) of the proposition, it will suffice to show that this derivative evaluated at $k_A = k_P$ is strictly positive, or,

$$e^{*'}(k_P)\frac{1}{2}k_P^2 B^2 > 0, \tag{23}$$

which follows from Lemma 1 and $k_P > 0$.

Turning to part (2), we will rely on monotone comparative statics theory. If the cross-partial of the President's objection function is positive, then we have that $\frac{\partial k^*}{\partial k_P} \geq 0$ (Milgrom and Shannon, 1994). Taking the derivative of (22) with respect to k_P, we have, from Lemma 1 and $k_A > k_P > 0$,

$$\left[e^{*'}(k_A)k_A + e^*(k_A)\right]B^2 > 0. \tag{24}$$

For part (3), we will first show that for $k^{max} > 2k_P$, $k^* < k^{max}$. To show this, it will suffice to show that for $k_A > 2k_P$, the derivative of the objective function given in (22) is strictly negative. To see that the expression in (22) is strictly negative, note that $e^{*'}(k_A) > 0$ (from Lemma 1), $k_A > 2k_P \rightarrow k_P k_A - \frac{k_A^2}{2} < 0$, $e^*(k_A) > 0$, and that $k_A > 2k_P \rightarrow k_P - k_A < 0$.

Part (1) of the proposition, together with $k_P > 0$ implies that $k^* > 0$. So for sufficiently high k^{max} we have that k^* is an interior solution. Applying Theorem 1 of Edlin and Shannon (1998), the increasing marginal differences established in the proof of part (2) of the proposition along with k^* in the interior implies our strict monotonicity result: $\frac{\partial k^*}{\partial k_P} > 0$. □

Proof of Proposition 2. To prove part (1), first note that the derivative of the President's objective with respect to k_A is

$$e_1^*(k_A, k_R)V(k_P, k_R).$$

From the implicit function theorem, we have

$$e_1^*(k_A, k_R) = \frac{\gamma k_R^* B^2}{\psi''(e^*(k_A, k_R))} > 0.$$

The second term is positive for any k_R the President would select. This immediately implies that $k_A^* = k^{max}$.

To prove part (2), first note that the derivative of the President's objective function with respect to k_R is

$$e_2^*(k_A, k_R)V(k_P, k_R) + e^*(k_A, k_R)V_2(k_P, k_R).$$

By the implicit function theorem, we have that,

$$e_2^*(k_A, k_R) = \frac{\gamma(k_A - k_R)B^2}{\psi''(e^*(k_A, k_R))}. \tag{25}$$

This implies that $e_2^*(k_A, k_R) \gtreqless 0$ as $k_A \gtreqless k_R$. Because $k_A = k^{max}$, this implies that $e_2^*(k_A, k_R) \geq 0$.

Next, note that,

$$V_2(k_P, k_R) = \gamma(k_P - k_R)B^2. \tag{26}$$

This implies that $V_2(k_P, k_R) \gtreqless 0$ as $k_P \gtreqless k_R$.

Observe now that if $k_R = k_A^* = k^{max}$, then $e_2^*(k_A, k_P) = 0$ and $V_2(k_P, k_R) < 0$, which together imply that the derivative of the President's objective function with respect to k_R evaluated at $k_R = k_A^*$ is strictly negative. This implies that $k_R^* < k^{max}$.

Next, observe that if $k_R = k_P < k_A^*$ then $e_2^*(k_A, k_R) > 0$ and $V_2(k_P, k_R) = 0$, which together imply that the derivative of the President's objective function with respect to k_R evaluated at $k_R = k_P$ is strictly positive. This implies that $k_R^* > k_P$.

To prove part (3), note that the derivative of the President's objective function with respect to k_R, evaluated at $k_R = k^*$ (the optimal full delegation Agency bias) and $k_A = k^{max}$, is,

$$\left[e_2^*(k^{max}, k^*)[k_P k^* - \frac{k^{*2}}{2}] + e^*(k^{max}, k^*)[k_P - k^*]\right]\gamma B^2. \tag{27}$$

We want to show that given our assumptions, this is negative, which implies our result. Normalize by dividing through by γB^2, and we get,

$$e_2^*(k^{max}, k^*)[k_P k^* - \frac{k^{*2}}{2}] + e^*(k^{max}, k^*)[k_P - k^*]. \tag{28}$$

Now substitute in for $k_P k^* - \frac{k^{*2}}{2}$ using the first order condition for the President's choice of k^*:

$$- e_2^*(k^{max}, k^*)[k_P - k^*]\frac{e^*(k^*)}{e^{*'}(k^*)} + e^*(k^{max}, k^*)[k_P - k^*]. \tag{29}$$

Since $k_P < k^*$, this expression is negative if and only if,

$$e^*(k^{max}, k^*) - e_2^*(k^{max}, k^*)\frac{e^*(k^*)}{e^{*'}(k^*)} > 0. \tag{30}$$

Rearranging yields,

$$\frac{e^{*'}(k^*)}{e^*(k^*)} > \frac{e_2^*(k^{max}, k^*)}{e^*(k^{max}, k^*)}. \tag{31}$$

Substitute for $e^{*'}(k^*)$ and $e_2^*(k^{max}, k^*)$ using expressions from the implicit function theorem, yielding,

$$\frac{k^*}{\psi''(e^*(k^*))e^*(k^*)} > \frac{k^{max} - k^*}{\psi''(e^*(k^{max}, k^*))e^*(k^{max}, k^*)}. \tag{32}$$

The condition stated in part (3) is that,

$$\frac{\partial \frac{\psi'(e)}{\psi''(e)e}}{\partial e} \leq 0. \tag{33}$$

In economic terms, this assumption is that the elasticity of supply of effort decreases in effort. To see this, note that the first order condition for the Agency's choice of effort when facing a expected payoff from finding an opportunity of A is $\psi'(e^*(A)) = A$. From the implicit function theorem, this effort will respond to increased incentives according to,

$$e^{*'}(A) = \frac{1}{\psi''(e^*)} \tag{34}$$

Thus, the elasticity of his supply of effort with respect to A is given by

$$\frac{A}{\psi''(e^*)e}, \tag{35}$$

and we can replace for A in the first order condition to get $\frac{\psi'(e)}{\psi''(e)e}$.

The sufficient condition in part (3) of the proposition is that this elasticity decreases in e. A simple example of an effort cost function that satisfies this condition as well as our other assumptions is $\psi(e) = \frac{1}{1-e} - 1$.

Under this condition, we have,

$$\begin{aligned} &\frac{k^{*2}/2}{\psi''(e^*(k^*))e^*(k^*)} = \frac{\psi'(e^*(k^*))}{\psi''(e^*(k^*))e^*(k^*)} > \\ &\frac{\psi'(e^*(k^{max}, k^*))}{\psi''(e^*(k^{max}, k^*))e^*(k^{max}, k^*)} = \frac{k^{max}k^* - \frac{k^{*2}}{2}}{\psi''(e^*(k^{max}, k^*))e^*(k^{max}, k^*)}, \end{aligned} \tag{36}$$

where the equalities follow from the Agency's first order conditions and the inequality hold by the decreasing elasticity condition, since $e^*(k^{max}, k^*) > e^*(k^*)$.

Dividing both sides by $k^*/2$, we have

$$\frac{k^*}{\psi''(e^*(k^*))e^*(k^*)} > \frac{2k^{max} - k^*}{\psi''(e^*(k^{max}, k^*))e^*(k^{max}, k^*)}, \tag{37}$$

which implies what we want to show, (32).

Finally, to prove part (4), observe that setting $k_A = k_R = k^*$ would replicate the outcome from full delegation, but the characterization above shows it is always possible to improve on that choice by either increasing k_A (if $k^* < k^{max}$) or decreasing k_R (if $k^* = k^{max}$).

□

Proof of Lemma 2. Full disclosure is an equilibrium iff

$$\left[k_A k_R - \frac{k_R^2}{2}\right] B_j^2 > [k_A B_j k_R \overline{B} - \frac{k_R^2 \overline{B}^2}{2}]$$

for $j \in \{H, L\}$. We can rewrite this condition as $k_A k_R B_j[B_j - \overline{B}] > \frac{k_R^2}{2}[B_j^2 - \overline{B}^2]$. Since $B_H > \overline{B}$, for B_H this simplifies to

$$k_A > k_R \frac{B_H + \overline{B}}{2B_H},$$

which can be rewritten as expression in the text. Since $B_L < \overline{B}$, for B_L this simplifies to

$$k_A < k_R \frac{B_L + \overline{B}}{2B_L},$$

which can be similarly rewritten.

In a proposed equilibrium with hiding after discovering B_j, hiding is optimal if

$$k_A k_R \hat{B}_j B_j - \frac{k_R^2}{2}\hat{B}_j^2 > [k_A k_R - \frac{k_R^2}{2}]B_j^2.$$

We can rewrite this condition as $k_A k_R B_j[\hat{B}_j - B_j] > \frac{k_R^2}{2}[\hat{B}_j^2 - B_j^2]$.

Since $B_L < \hat{B}_L$, for B_L the condition simplifies to

$$k_A > k_R \frac{B_L + \hat{B}_L}{2B_L},$$

which can be rewritten as the expression in the text.

Since $B_H > \hat{B}_H$, for B_H this simplifies to

$$k_A < k_R \frac{B_H + \hat{B}_H}{2B_H},$$

which can be similarly rewritten.

Proof of Proposition 3. [IN PROCESS.]

Proof of Proposition 4. [IN PROCESS.]