Information, Accountability, and the Politics of Investigations

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Abstract

We develop a game-theoretic model that identifies the conditions under which a political executive such as a president can exert control over an appointee who decides whether to investigate possible legal violations. Because investigations are a necessary precondition for law enforcement, the politically-appointed investigator exerts significant influence over whether, and the extent to which, laws and rules are enforced. The executive can exert power over the investigator’s actions only indirectly, via that threat of replacement. This threat is most effective when the investigator has preferences that diverge from those of the executive. In contrast, when the investigator and executive share similar preferences, the threat of replacement can induce the investigator to behave dogmatically, sometimes even deviating from the executive’s preferred actions. More subtly, we show that the effect of the replacement threat on the investigator’s behavior hinges on the degree to which the executive is able to predict the behavior of potential replacements: an executive can sometimes gain leverage over the investigator if he can credibly threaten to replace her with a dogmatist. Our results have broad implications for the politics of law and regulatory enforcement in the United States and other developed democracies.
Although the Department of Labor currently has the necessary tools to fight wage theft...the problem of wage theft is only getting worse because of weaker enforcement... in too many cases, investigators from the Wage and Hour Division simply drop the ball in pursuing employers that cheat their employees out of their hard earned wages.


Regulation consists of two components: rulemaking and enforcement. First, a rule must be created that defines the permissibility of certain activities. These rules may be established by legislation, such as when Congress dictates that attempting to monopolize consumer product markets is illegal. Alternatively, rules may be created by bureaucratic agencies, such as when the Environmental Protection Agency issues standards for water quality. The extent to which regulatory rulemaking can be influenced by principals such as voters or executives has been the source of much debate. A wide body of literature (e.g., Miller and Stokes 1963, Shapiro, Brady, Brody and Ferejohn 1990) has analyzed whether legislative voting and policy priorities reflect constituent preferences. Similarly, scholars have investigated how Congress (e.g., McCubbins, Noll and Weingast 1987, Ferejohn and Shipan 1990) and the President (e.g., Moe 1985) design institutions to enhance or constrain bureaucrats’ abilities to create policy.

While many scholars have studied control of political actors who enact law or rules, relatively few researchers have systematically analyzed the second component of regulation: enforcement. For a rule to be substantively meaningful, it must be followed, and rules are typically enforced in the following manner. First, an actor, such as a prosecutor or regulator, must decide whether a violation is likely to have occurred. She must then put the presumed violator on trial, by which we mean any judicial or quasi-judicial proceeding in which a defendant’s guilt or innocence is determined, based on the evidence at hand. Finally, a judgment is rendered, and a penalty is doled out if a
defendant is found guilty.

Our analysis in this paper focuses on investigations, which are a particularly understudied aspect of enforcement. Investigations of alleged wrongdoing are necessary for enforcement, and in many situations the decision to investigate has political implications, because by commencing or inhibiting investigations, a bureaucratic agent can affect the likelihood that outcomes will be consistent with the preferences of her political superior.

In addition to the controversy over enforcement of wage and hour laws highlighted in the quotation at the start of this paper, several other recent events underscore the political relevance of the decision to investigate. In December 2006, for example, the Department of Justice fired seven U.S. attorneys, ostensibly because of their job performances. Subsequently, however, it was revealed that most of the firings appeared to be based on the attorneys’ unwillingness to advance partisan objectives. Most notably, a New Mexico-based U.S. Attorney (David Iglesias) argued that he was fired because he did not aggressively pursue allegations of Democratic voter fraud.1

The political salience of investigations is also clearly relevant to a variety of bureaucratic enforcement activities. Consider, for example, the issues that emerged in an April 2007 congressional hearing regarding OSHA’s response to workers at a Jasper, Missouri popcorn plant who had developed bronchiolitis obliterans, also known as “popcorn worker’s lung.” According to testimony, OSHA sent to the Jasper plant only one inspector, who did not test the air quality at the facility, yet concluded that the plant complied with existing guidelines.2 In contrast, the more extensive investigatory activities of the National Institute for Occupational Safety and Health supported the conclusion that the workers’ illnesses were caused by the food additive diacetyl, eventually prompt-
ing OSHA to prepare a safety bulletin regarding the use of the additive. This incident, combined with other cases of OSHA intervention, or lack thereof, raised questions regarding the extent to which OSHA adequately protected workers’ health and welfare, and the ways in which the White House influenced regulatory policy by appointing regulators who were hesitant to investigate firms.

To understand bureaucratic policymaking in these, and many other, settings, it is crucial to study the political control of investigators. This is particularly true because investigators’ decisions have a direct impact on the effectiveness of the laws and rules that govern society. Given the length of time required to promulgate new regulations and administrative rules (see, e.g., Kerwin 2003), the most salient impact of new political appointees is not necessarily the policy agendas that they seek to promote, but rather the ways in which they choose to enforce or neglect existing rules.\footnote{The history of the EPA provides a perfect example of this phenomenon. Among the complaints that environmental activists had about Anne Gorsuch, Reagan’s EPA Administrator from 1981-1983, was her failure to adequately enforce existing statutes.}

Investigatory politics are distinct from other political phenomena due to the fact that investigations are about charges of misconduct. In other words, an investigation is supposed to determine whether laws or regulations have been violated. Procedures for investigations are judicialized, in the sense that witnesses are called, testimony is considered, due process is followed, and decisions are made based on a pre-determined set of standards. This judicialization implies that legal and regulatory investigations are not purely show trials. The person initiating an investigation cannot control every detail of how the investigation proceeds – rather, the investigation, once set in motion, may yield outcomes that are contrary to her preferences. Because investigations are meaningful, the decision about whether to commence an investigation is crucial, and inherently political. For example, a pro-business or pro-consumer attorney within the Department of Justice may be highly hesitant or highly zealous, respectively, to commence antitrust investigations.

Of course, an investigator’s preferences over the virtues of certain cases and the risk of errors at
trial may differ from those of her political principals. These principals could be voters, as in the case of elected prosecutors. Alternatively, principals could be executives, e.g., governors or presidents, as in the case of political appointees such as U.S. Attorneys or the Assistant Secretary of Labor for OSHA. Regardless of the specific institutional context of the principal-agent relationship, many investigators can be removed from office if their principals are unsatisfied with their performance.

In this paper, we develop a model of investigatory politics wherein a bureaucratic agent with private preferences decides whether to pursue or drop a case. A political principal observes the agent’s decision, as well as the outcome if the case is brought to trial, and then decides whether to retain or replace the agent. We use the model to assess the degree to which the political principal can influence his agent’s decisions to pursue, or not pursue, investigations. Even though the principal does not know the agent’s preferences, the threat of replacement is a powerful tool for increasing control over agents who do not share the principal’s preferences.

Somewhat surprisingly, however, the threat of replacement does not always induce the agent to follow her political superiors’ wishes more closely, compared to what she would do if the principal could not remove her from office. In particular, an agent who shares the principal’s preferences may be induced to exaggerate the extent to which she leans in his direction. We also extend the model to demonstrate that this pathology can be somewhat ameliorated when political principals can credibly commit to appoint well-known ideologues as replacements for incumbent investigators.

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4 Similar comparisons can likewise be made with regards to the investigatory and enforcement activities conducted by virtually every type of cabinet-level agency with regulatory power, such as the EPA, FDA, and every division and agency within the Department of Justice.

5 The same does not hold true for regulators who serve in independent regulatory agencies, such as the FTC, FCC, and others, who upon being confirmed by the Senate, cannot be terminated by the executive. Even in these settings, however, the dynamic that we model is relevant to investigatory processes. Coate, Higgins, and McChesney (1990, 470 n. 23) comment on how in 1987, the director of the FTC’s Bureau of Competition (an individual who serves at the pleasure of the FTC chairman) was accused of bringing too few cases before the Commission.
This paper proceeds as follows. We first describe the ways that investigations are conventionally studied and note how our approach deviates from the dominant perspectives in the literature. We then discuss theoretical issues that are relevant to understanding the politics of investigations and explain why existing theories of policy choice are not appropriate to address this topic. The next two sections introduce the model, present our baseline results, and analyze the extension to cases where the executive can appoint a known dogmatist. Finally, we conclude with a discussion of the implications of our findings, and further directions for research.

Literature

Political investigations have been studied most prominently in the context of the legislative politics, and Mayhew (1989, 8) articulates the thoughts of many scholars by arguing that “beyond making laws, Congress probably does nothing more consequential than investigate alleged misbehavior in the executive branch.” Congressional investigations are clearly an important part of the policy-making process, yet they are different from the types of investigations that we consider here, in that congressional investigations are generally not conducted with an eye towards placing the accused parties on trial. Rather, under the best circumstances they are “a principal means of educating public opinion, of rooting out wrongdoing, and of keeping the administration sensitive to public opinion” (Stamps 1952, 613). And, under the worst circumstances, congressional investigations are conducted simply for the purpose of grand-standing or fostering partisan discord.

More consistent with our focus on bureaucratic investigations is Wood and Anderson’s (1993) analysis of the Department of Justice’s antitrust division. Recognizing that the decision to investigate is a necessary condition for effective enforcement of existing laws and regulations, Wood and

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6McCubbins and Schwartz (1984) and Aberbach (1991) also speak to the virtues of committee hearings and investigations as effective means of bureaucratic control.
Anderson argue (1993, 3) that “the primary devices used by the Antitrust Division to enforce the antitrust laws are investigations and litigations of possible anticompetitive practices...investigations serve a dual role in the enforcement process. They provide an opportunity for negotiation, and they furnish the evidentiary basis for litigations.”

Hence, questions about bureaucratic accountability implicitly require an analysis of the determinants and consequences of investigations. Wood and Anderson identify how the Antitrust Division’s investigatory activities are related to its budget, which, in turn, is highly responsive to who is in the White House. Depending on a President’s regulatory priorities, then, one clear way to influence law enforcement is simply to change the budget, which will have the downstream impact of increasing or decreasing enforcement activity.

A small, but interesting body of theoretical work is also relevant to our efforts. Scholz (1991) develops a theory in which political principals may lack information about their bureaucratic agents’ preferences and shows that this information asymmetry can hinder effective enforcement. However, he does not analyze how the threat of removal may affect agents’ decisions, and rather than explicitly analyzing principals’ beliefs and equilibrium strategies he presents a semi-formalized analysis of 2x2 games based on a repeated prisoner’s dilemma. More importantly, he does not explicitly model agents’ decisions to initiate investigations, whereas that choice is central to our model.

O’Connell (2007) develops a formal model to analyze the relationship between Congress and the Government Accountability Office. O’Connell’s model differs from ours in several important ways. Most notably, in O’Connell’s model the GAO unambiguously knows ex ante whether a violation has occurred. Hence, her model is not about the decision to investigate, but rather about the decision to report violations. Moreover, our model is fundamentally based on actors’ relative concerns over Type I errors (mistaken convictions of the innocent) versus Type II errors (failures to convict the

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7A substantial body of literature (e.g., Asch (1975), Lewis-Beck (1979), Long, Schramm and Tollison (1973), Posner (1970), Siegfried (1975)) examines the second device for enforcement, analyzing the determinants of the number and types of cases litigated by antitrust authorities.
guilty), whereas in O’Connell’s model such concerns are irrelevant.

The theory that is most closely related to our analysis is Gordon and Huber’s (2002) model of elected prosecutors. Gordon and Huber assume that prosecutors wish to hold office, whereas voters care about Type I and Type II errors. Prosecutors are assumed to be work-averse, in that they wish to avoid conducting investigations, even though investigations generate information about a defendant’s guilt or innocence. A major finding of their model is that it is always optimal for voters to re-elect a prosecutor who obtains a conviction, remove a prosecutor who obtains an acquittal, and employ a mixed strategy for prosecutors who drop cases.8

The most significant way that we diverge from Gordon and Huber is that we assume that investigators, like voters, care about Type I versus Type II errors and we allow for the possibility of preference divergence between a principal and his agent.9 Moreover, unlike Gordon and Huber, we do not assume that a principal can precommit to a particular mechanism to induce investigators to choose desirable actions. As a result we believe that our model and results are more appropriate for political settings, where principals typically cannot make binding commitments to contracts that specify rewards and punishments for their agents. After presenting our model, we briefly discuss how our predictions differ from those of Gordon and Huber.

8Like Gordon and Huber, Dewatripont and Tirole (1999) develop a model in which a principal designs a mechanism to induce agents to exert costly effort to gather information. A major difference between that paper and both Gordon and Huber and our model is that Dewatripont and Tirole assume that the principal, not the agent, decides what actions to take.

9Gordon and Huber (2002, 347) recognize this as an alternative approach to modeling interactions between voters and prosecutors.
Theoretical Issues

The types of investigations that we model are relevant to conventional prosecutor-initiated investigations, as well as many aspects of bureaucratic enforcement. Existing theories of policy choice are typically designed to be applied to legislatures, and thus are not tailored to the politics of investigations and bureaucratic accountability. Hence, they fail to incorporate numerous salient features of the investigatory environment. Before moving onto an explicit presentation of our model, we highlight certain elements that are common to a wide variety of investigations.

Information  Some investigations are simply a matter of political grandstanding, in the sense that they are unlikely to uncover any new and relevant information. As noted, for example, by Coker (1954, 494) in his discussion of the Red Scare congressional hearings, “congressional investigators often appear to be acting as partisans seeking personal or party prestige, or as prosecutors bent on punishing individuals, rather than legislators seeking information needed for intelligent and effective legislation.” Our theory does not speak to such investigations, which are best regarded as simply a form of position-taking. Similarly, our theory is not relevant to high profile hearings, when the primary purpose is to harass, or discipline, bureaucrats, rather than to gather information about the innocence or guilt of the “defendant.”

The types of investigations that we study are, in part, about gathering information, but in a fundamentally different manner than how information is treated in most spatial models of policy choice. In such models (e.g., Gilligan and Krehbiel 1987, Bendor and Meirowitz 2004), information acquisition involves learning more about the state of the world, which is generally beneficial to all actors. For example, as the Cold War was winding down in 1990, legislators across the political spectrum wondered how much the threat of war had decreased. Information on this topic was useful, and valuable, to all political actors, as better quality information enabled legislators to form
more effective and predictable policies. Hence, information was a collective good.

When thinking about the politics of investigations, in contrast, information is not universally desired by political actors. In criminal trials and bureaucratic investigations, information acquisition leads to enforcement. Thus some actors may prefer that information not be gathered, because of the possibility that investigations and trials may lead to erroneous verdicts that nevertheless produce real consequences, such as jail time. Hence, standard models of incentives for information acquisition cannot be easily employed to analyze the types of problems that we wish to study.

**Accountability** Our theory is most notably about the accountability relationship between a political principal and her agent. To analyze accountability, many existing models, particularly those building on the mechanism design literature, focus on how to induce effort by a work-averse agent. We focus, instead, on preference divergence between a political principal and her agent over policy outcomes. The crucial problem a principal faces in our model is how to control the person launching the investigation, who has private information about her preferences and about policy. Our theory is thus relevant to a wide array of principal-agent relationships in political institutions. Obvious examples include the relationship between a President and his subordinates in cabinet agencies, as well as the relationship between agency heads and their subordinates who initiate investigations.

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10 For an accountability model that synthesizes concerns over effort and preference divergence in the context of a spatial model of policy delegation see Gailmard and Patty (2007).

11 While many agency subordinates are civil servants who cannot generally be terminated, in several contexts, they can be effectively relieved of their responsibilities in the manner that we describe in our model. Hilts (2003, 178-190), for example, documents how civil servants at the FDA were routinely relieved of their investigatory responsibilities, and sometimes induced to resign, due to policy disagreements with higher-ranking presidential appointees during the Nixon Administration.
Relationship to previous work  At a technical level, our model builds on Canes-Wrone and Shotts (2007), who develop a model of extremism and moderation by elected officials. The elected official in Canes-Wrone and Shotts picks policy unilaterally, and voters observe directly the success or failure of this policy. Although that model is relevant to our efforts, two distinctions limit its applicability to the politics of investigations.

First, in any investigation there is an inherent asymmetry in the political principal’s ability to learn about the actual guilt or innocence of a defendant. If a case is brought to trial, then the principal can potentially learn quite a lot, but if the case is not brought to trial – or, if an investigation is not launched in the first place – the principal learns relatively little about the defendant’s guilt or innocence. Canes-Wrone and Shotts, in contrast, analyze a game in which voters always observe the success or failure of a policy regardless of what action the official takes, a setup that fails to capture the dynamics between political principals and their agents in investigations.

The second major difference is that the outcome of an investigation or trial does not perfectly reveal whether the defendant was truly innocent or guilty. All that the principal knows is the court’s verdict, which could, of course, be mistaken. Thus any model of investigations, including the one that we develop here, must allow for the possibility of errors in the judicial process.

Our approach also diverges from Canes-Wrone and Shotts in that we extend our model to examine situations in which an executive has the option of replacing an incumbent investigator with a well-established ideologue. This assumption would be inappropriate for an electoral model, such as Canes-Wrone and Shotts, where a voter has limited control over policy preferences of a potential electoral challenger, but it is quite appropriate in a model of bureaucratic enforcement, given that an executive may be able to choose from many possible appointees, some of whom have well-established policy priorities.
The Model

We develop a game of selection, retention, and replacement, played by a political principal, who we refer to as the **executive**, and his agent, who we refer to as the **investigator**. The game is played across two periods, and in each period there is one case. In the first period, the investigator receives a signal regarding the guilt or innocence of a potential defendant and decides whether to bring the case to trial. At trial, the defendant is either convicted or acquitted. The executive observes whether the investigator pressed forward with a case, as well as the outcome of a trial (when one occurs), and decides whether to retain or replace the investigator. This sequence of events is repeated in the second period, except that the executive does not have the option of replacing the investigator. Figure 1 presents the extensive form of the game. We begin our analysis by examining the strategic incentives for the investigator and executive, given their preferences over outcomes.

Preferences

In a model of investigations, it is natural to assume that actors prefer to avoid both Type I and Type II errors. Of course, people differ in their degrees of concern over these two types of errors, and we parameterize these preferences with an **aggressiveness coefficient** $\alpha \in [0, 1]$, subscripted as $\alpha_I$ for the investigator and $\alpha_E$ for the executive. An actor’s aggressiveness influences her payoffs, based on a defendant’s actual guilt or innocence and the final outcome, as represented in Table 1.

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12In reality, many cases that are carried forward by regulators are settled rather than taken to trial. While our model does not account for this option, it is reasonable to argue that settling is substantively similar to dropping cases (at least moreso than trying cases). How the settling option influences investigator behavior and executive control is a topic that is worthy of future study, but is beyond the scope of the current paper.
Thus an individual with a high aggressiveness coefficient, $\alpha \approx 1$, is concerned almost exclusively with ensuring that the guilty are convicted, whereas someone with a low aggressiveness coefficient, $\alpha \approx 0$, is concerned almost exclusively with ensuring that the innocent are not falsely convicted.

More generally, an actor’s aggressiveness coefficient could be interpreted as a predisposition for, or against, a variety of interests, depending on the policy domain under consideration. For example, in antitrust enforcement, an investigator who is generally predisposed towards consumer interests would have a high $\alpha$, meaning that she would generally prefer to take accused firms to trial. Alternatively, in the case of environmental protection, an administrator who is sympathetic to business interests would have a low $\alpha$, meaning that she would be relatively hesitant to pursue allegations of environmental misconduct.

An accused party is either guilty or not guilty, $\omega \in \{G, NG\}$, and we assume that the prior probability of guilt is $\pi \in (0, 1)$. The investigator has an additional private signal $s \in \{G, NG\}$ about the defendant’s innocence or guilt, and the probability that this signal is correct, conditional on the accused’s true innocence or guilt, is $q > 1/2$. Given this setup, Bayes’s Rule implies that the conditional probability of guilt is $\gamma^G \equiv \frac{\pi q}{\pi q + (1-\pi)(1-q)}$ when the investigator observes a guilty signal $s = G$, and $\gamma^{NG} \equiv \frac{\pi(1-q)}{\pi(1-q) + (1-\pi)q}$ when she observes $s = NG$.

Consistent with real-world investigations and trials, we assume that the adjudicative process is potentially-errorneous.\textsuperscript{13} Specifically, we assume that the error rate, given that the defendant is

\begin{table}[h]
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\begin{tabular}{|c|c|c|}
\hline
\textbf{Table 1: Payoffs} & & \\
\hline
 & Convicted & Not Convicted \\
\hline
Innocent & $-(1-\alpha)$ & 0 \\
Guilty & 0 & $-\alpha$ \\
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\end{tabular}
\end{table}

\textsuperscript{13}If this weren’t the case, then the model would be trivial as regardless of an actor’s aggressiveness coefficient, he would want all cases to be brought to trial.
guilty, is \( \rho_G \in (0, \frac{1}{2}) \), whereas the error rate, given that the defendant is innocent, is \( \rho_{NG} \in (0, \frac{1}{2}) \). The trial produces an outcome of either a conviction, denoted \( C \), or an acquittal, denoted \( A \).

Building on this foundation, we can easily characterize an investigator’s preferred action in a given period, as a function of the information available to her, as well as her aggressiveness, parametrized by \( \alpha_I \).\(^{14}\) There are two key cutpoints for \( \alpha_I : \underline{\alpha} \) and \( \bar{\alpha} \). If \( \alpha_I < \underline{\alpha} \), we say that the investigator is passive, because she wants to drop the case regardless of her private signal. If \( \alpha_I \in (\underline{\alpha}, \bar{\alpha}) \) we say the investigator is neutral, because she wants to follow her signal, bringing cases to trial when \( s = G \) but not when \( s = NG \). Finally, if \( \alpha_I > \bar{\alpha} \), we say the investigator is aggressive because she always wants to bring a case to trial, regardless of her signal.

It is clear that in the second period, an investigator will choose to drop a case or press ahead based solely on her \( \alpha_I \) value and her signal \( s \in \{G, NG\} \). Because there is no possibility of punishment, i.e., termination, by the executive, the investigator’s second-period decision is entirely a function of the tradeoff that she faces between Type I and Type II errors in a decision-theoretic environment. In contrast, in the first period, because there is a degree of preference heterogeneity within each category of investigators (passive, neutral, and aggressive), investigators’ behaviors within a category can differ when they face potential termination as the result of their decisions.

Given this underlying preference heterogeneity, one can characterize any investigator, based on her aggressiveness parameter \( \alpha_I \), as passive-leaning, if her primary goal is to make sure that cases are dropped when \( s = NG \), or aggressive-leaning, if her primary goal is to make sure that cases proceed to trial, when \( s = G \). Moreover, we can define a cutpoint \( \tilde{\alpha} \in (\underline{\alpha}, \bar{\alpha}) \) such that an investigator is passive-leaning if \( \alpha_I < \tilde{\alpha} \) and aggressive-leaning if \( \alpha_I > \tilde{\alpha} \).\(^{15}\) Thus, the set of passive-leaning investigators consists of all passive investigators and some neutral ones, while the set of aggressive-leaning investigators consists of all aggressive investigators and some neutral ones.

\(^{14}\) Details on this result are presented in Lemma 1 in the appendix.

\(^{15}\) This cutpoint \( \tilde{\alpha} \) is defined in Lemma 2 in the appendix.
Figure 2 illustrates the relationship between the definitions of passive, neutral, aggressive, passive-leaning, and aggressive-leaning, which will be used later as we characterize equilibrium behavior.

**Control With Accountability**

Given an actor’s aggressive coefficient $\alpha$, we characterize his preferences as follows:

$$U = -\alpha \{\text{Total number of guilty defendants not convicted}\}$$

$$\quad - (1 - \alpha) \{\text{Total number of innocent defendants convicted}\}.$$  

Note that this specification implies that investigators care about the outcomes of cases even if they are not in office, as might occur if they are terminated and replaced.

Let the probability that the executive retains the investigator be $\sigma_D, \sigma_C,$ and $\sigma_A$ for when she drops a case, obtains a conviction at trial, and obtains an acquittal at trial, respectively. We assume that the executive cannot commit to a reward schedule $\sigma = (\sigma_D, \sigma_C, \sigma_A)$, but rather that his behavior is determined in equilibrium.

The first period investigator’s aggressiveness coefficient $\alpha_I$ is drawn from a uniform distribution on $[0, 1]$, and we assume that $\alpha_I$ is the investigator’s private information. For the purposes of baseline analysis, we assume that if the investigator is removed after the first period, then her replacement’s aggressiveness coefficient is also drawn from this same distribution. The executive’s retention decision is based on his expected future payoffs from the incumbent or her replacement, and these payoffs depend on his beliefs about each of the two investigators, as well as his own aggressiveness coefficient, $\alpha_E \in [0, 1]$, which is common knowledge.

Like investigators, executives can be categorized as passive, neutral, or aggressive, depending on what decision rule they would prefer the investigator to follow. For neutral executives, i.e., those who want the investigator to follow her signal, we make a slightly finer distinction, based on which
direction they lean. Specifically, we distinguish between executives that are passive-neutral (PN), meaning those with $\alpha_E$ just a bit above $\alpha$, aggressive-neutral (AN), meaning those with $\alpha_E$ just a bit below $\check{\alpha}$, and truly-neutral (TN), meaning those with $\alpha_E$ between the PN and AN regions. The different executive categories are illustrated in Figure 3 and defined formally in the appendix.

Defining Control

We seek to identify conditions under which the investigator’s decisions to initiate first-period investigations are congruent with the executive’s wishes, and how the accountability incentive provided by the threat of replacement affects the executive’s ability to control the investigator. There are three possible ways that accountability could affect the investigator’s behavior. It may have no effect, it may increase control, or it may actually decrease control. In the analysis that follows we characterize control as a function of the executive’s and the investigator’s types.

We say that accountability has no effect if for all investigator preferences (as parametrized by $\alpha_I$) within a given category (passive-leaning or aggressive-leaning), the investigator’s first period equilibrium actions, given the threat of replacement, are unaffected by the threat.

Accountability increases control if two conditions are satisfied. First, for all investigator preferences within a given category (passive-leaning or aggressive-leaning), for each signal $s \in \{G, NG\}$, the investigator’s equilibrium actions are at least as good, from the executive’s perspective, as in the absence of accountability. Second, for some investigator preferences within a given category and at least one signal, the executive strictly prefers the investigator’s actions compared to what would occur in the absence of accountability. Such a scenario might occur, for example, if the executive is neutral and some passive-leaning investigators are induced to try a case when $s = G$.

Finally, accountability decreases control if for all investigator preferences within a given category, for each signal $s \in \{G, NG\}$, the investigator’s equilibrium actions are no better, from the
executive’s perspective, than in the absence of accountability, and for some investigator preferences and at least one signal, equilibrium actions make the executive strictly worse off than what would occur in the absence of accountability. Such a scenario might occur, for example, if the executive is neutral and some passive-leaning investigators are induced to drop the case when $s = G$.

While one might naturally expect that accountability incentives would inevitably increase an executive’s control over the investigator, the opposite can actually occur in certain situations. To identify why this might be the case, consider a generic retention strategy $\sigma = (\sigma_A, \sigma_C, \sigma_D)$. If the probability of being re-elected after dropping a case ($\sigma_D$) increases, the investigator has an increased incentive to drop cases, whereas if the probability of being re-elected after a conviction or acquittal ($\sigma_C$ or $\sigma_A$) increases, the investigator has increased incentives to try cases.

Hence, for a passive executive, control over both passive-leaning and aggressive-leaning investigators is increasing in $\sigma_D$, and decreasing in $\sigma_A$ and $\sigma_C$. Conversely, for an aggressive executive, the opposite is true: control over both passive-leaning and aggressive-leaning investigators is decreasing in $\sigma_D$, and increasing in $\sigma_A$ and $\sigma_C$. Thus, it is relatively easy for dogmatic executives, whether passive or aggressive, to achieve the maximum possible control. A passive executive may, for example, retain an investigator if and only if she drops ($\sigma_D = 1$ and $\sigma_A = \sigma_C = 0$), whereas an aggressive executive may retain an investigator if and only if she tries a case ($\sigma_D = 0$ and $\sigma_A = \sigma_C = 1$). Indeed, as we show later, these types of strategies are always used in equilibrium by dogmatic executives.

While accountability clearly can facilitate control for dogmatic executives, the same will generally not hold for a neutral executive. More specifically, for a neutral executive – who wants the investigator to try if and only if she sees a guilty signal – increased control over one category of investigators comes at the cost of decreased control over the other category. For example, increasing $\sigma_D$ ensures greater control over aggressive-leaning investigators, who become more likely to drop
when they see \( s = NG \), but it also decreases control over passive-leaning investigators, who become more likely to drop when they see \( s = G \). Likewise, increasing \( \sigma_A \) or \( \sigma_C \) increases incentives to try cases, thereby increasing control over passive-leaning investigators at the cost of decreased control over aggressive-leaning investigators.

The only way a neutral executive can achieve increased control over both passive-leaning and aggressive-leaning investigators is to simultaneously increase \( \sigma_C \) and decrease \( \sigma_A \). More specifically, to have increased control over both types of investigators, relative to what happens in the absence of accountability, requires that \( \sigma_C > \sigma_D > \sigma_A \), and the following inequalities are satisfied:

\[
\begin{align*}
\sigma_C [\gamma^G (1 - \rho_G) + (1 - \gamma^G) \rho_{NG}] + \sigma_A [(1 - \gamma^G) (1 - \rho_{NG}) + \gamma^G \rho_G] & > \sigma_D \quad (1) \\
\sigma_C [\gamma^{NG} (1 - \rho_G) + (1 - \gamma^{NG}) \rho_{NG}] + \sigma_A [(1 - \gamma^{NG}) (1 - \rho_{NG}) + \gamma^{NG} \rho_G] & < \sigma_D. \quad (2)
\end{align*}
\]

Equation 1 ensures that the investigator has an incentive to investigate when she sees a signal indicating guilt, given her belief \( \gamma^G \), and Equation 2 ensures that the investigator has an incentive to drop the case when she sees a signal indicating innocence, given her belief \( \gamma^{NG} \).

**Results**

The results of our baseline model are summarized in Table 2, where a “+” indicates that accountability increases the executive’s control over a given category of investigator in equilibrium, and a “−” indicates decreased control. We characterize the effects based on whether the executive is passive, passive-neutral, truly-neutral, aggressive-neutral, or aggressive, and the investigator is passive-leaning or aggressive-leaning. The second column (“accountability incentive”) identifies the first-period action that maximizes an investigator’s probability of being retained.
Table 2: Control with Random Replacement

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<thead>
<tr>
<th>Executive Type</th>
<th>Accountability</th>
<th>Investigator Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Incentive</td>
<td>Passive-Leaning</td>
</tr>
<tr>
<td>Passive (P)</td>
<td>drop</td>
<td>+</td>
</tr>
<tr>
<td>Passive-Neutral (PN)</td>
<td>drop</td>
<td>−</td>
</tr>
<tr>
<td>Truly-Neutral (TN)</td>
<td>try iff $s = G$</td>
<td>+</td>
</tr>
<tr>
<td>Aggressive-Neutral (AN)</td>
<td>try</td>
<td>+</td>
</tr>
<tr>
<td>Aggressive (A)</td>
<td>try</td>
<td>+</td>
</tr>
</tbody>
</table>

Table 2 clearly shows that accountability doesn’t always increase control over investigators compared to what would occur if there was no threat of termination – in certain circumstances it actually decreases executive control. For executives who lean one way or the other (P, PN, AN, A), accountability unambiguously increases control of the investigators who are least like them. However, unless the executive is truly dogmatic, i.e., P or A, this increased control over divergent investigators comes at the cost of reduced control over like-minded investigators. In fact, the only executives who can encourage “neutral competence” by investigators, in equilibrium, are the small subset of executives that we label as truly neutral.

We now present our results in more detail. The equilibrium concept that we employ is Perfect Bayesian. For passive and aggressive executives there exists a unique equilibrium, but for some types of neutral executives multiple equilibria may exist, and in these cases, we focus on the following equilibria. If, for a given $\alpha_E$ there exists an equilibrium that satisfies both Equations 1 and 2, so that the executive achieves increased control over both passive-leaning and aggressive-leaning investigators, then we characterize this type of equilibrium. If the executive is too passive for such an equilibrium to exist, we characterize an equilibrium in which investigators are rewarded for dropping cases. Likewise, if he is too aggressive for such an equilibrium to exist, we characterize
an equilibrium in which investigators are rewarded for trying cases.\textsuperscript{16}

We now discuss in detail the results for each type of executive. Proofs are in the appendix.

\section*{Dogmatic Executives}

\textbf{Proposition 1} If the executive is passive, then investigators have an incentive to drop cases regardless of their signals. Hence, accountability increases the executive’s control of passive-leaning investigators, who become more likely to drop when $s = G$, and of aggressive-leaning investigators, who become more likely to drop when $s = NG$.

\textbf{Proposition 2} If the executive is aggressive, then investigators have an incentive to try cases regardless of their signals. Hence, accountability increases the executive’s control of passive-leaning investigators, who become more likely to try when $s = G$, and of aggressive-leaning investigators, who become more likely to try when $s = NG$.

Accountability incentives influence investigator behavior in a straightforward manner in Propositions 1 and 2. Because an investigator is rewarded for taking certain actions, and she may be replaced by another investigator with different policy preferences, she is more willing, on the margin, to take the action that is favored by the executive.

The rationale that underlies the executive’s retention decision is somewhat more subtle. Whenever the executive sees a trial, he concludes that the investigator is relatively aggressive. Alternatively, when he observes an investigator dropping a case, he concludes that she is relatively passive. Hence, a passive executive strictly prefers to retain an investigator who drops a case and to remove

\textsuperscript{16}We choose to focus on these equilibria largely because they are substantively the most interesting and relevant to our broad questions regarding executive control of subordinate investigators. Focusing on other equilibria that potentially exist yields little insight.
an investigator who tries a case, whereas an aggressive executive has the opposite preferences, because of his beliefs about the types of investigators who take each action.

**Passive-Neutral and Aggressive-Neutral Executives**

In contrast to dogmatic executives, we see that neutral executives, i.e., those who prefer that the investigator bring a case to trial if and only if $s = G$, face tradeoffs. One the one hand, they want the investigator to try the case if and only if $s = G$, but, as noted above, any increase in the incentive to try cases when $s = G$ can increase the investigator’s incentive to try cases when $s = NG$. The ways in which these tradeoffs map into meaningful control depend on whether the executive is truly neutral, or somewhat biased in either a passive or aggressive direction. We first consider those who are somewhat biased.

**Proposition 3** If the executive is passive-neutral, then investigators have an incentive to drop cases regardless of their signals. Hence, accountability increases the executive’s control of aggressive-leaning investigators, who become more likely to drop when $s = NG$, but it decreases the executive’s control of passive-leaning investigators, who become more likely to drop when $s = G$.

**Proposition 4** If the executive is aggressive-neutral, then investigators have an incentive to try cases regardless of their signals. Accountability increases the executive’s control of passive-leaning investigators, who become more likely to try when $s = G$, but it decreases the executive’s control of aggressive-leaning investigators, who become more likely to try when $s = NG$.

Hence, when given the opportunity to terminate investigators, an executive acquires some control over those whose preferences diverge from his own, but this control comes at a cost. Some neutral investigators who lean in the executive’s direction and who would prefer to follow their signals in ways that would generally benefit the executive, now choose to ignore their signals. Hence,
the executive is worse off when dealing with these types of investigators than if she had no oversight capacity.

It is important to note that accountability incentives are essentially similar between Propositions 1 and 3, in which investigators have incentives to drop cases, as well as between Propositions 2 and 4, in which investigators have incentives to try cases. The difference between these propositions is whether the executive is uniformly pleased with the effect of these incentives. While dogmatic executives appreciate increased control over all types of investigators, passive-neutral and aggressive-neutral executives see that increased control over some types of investigators comes at the cost of decreased control over other types of investigators.

One might wonder, then, why would an executive employ this sort of accountability rule, given that it can induce problematic investigator behavior? The answer to this question follows directly from noting how the executive draws inferences about an investigator’s type based on her first-period actions. As noted above, if the investigator drops a case, an executive infers that she is likely passive, and most likely not aggressive. Hence, a passive-neutral executive would prefer to retain the investigator, because doing so increases the chance that he retains a relatively ideologically-similar investigator. This is most likely better than what would happen if he replaces her with a randomly drawn new investigator. In contrast, after observing a dropped case, an aggressive-neutral executive removes the investigator, because he expects to be more happy with a randomly-drawn replacement in the second period than with the current investigator, who probably does not share his policy priorities. Although this accountability rule can produce the perverse outcomes in Propositions 3 and 4, it is the best that an executive can do given the investigator’s equilibrium behavior.
Truly-Neutral Executives

The final case to consider in our baseline analysis is that of a truly-neutral executive. We will show that a truly-neutral executive does not face the same tradeoffs as slightly biased executives. More specifically, truly-neutral executives are able to achieve increased control over both aggressive-leaning and passive-leaning investigators.

Proposition 5 If the executive is truly-neutral, investigators have an incentive to try if and only if $s = G$. Accountability increases the executive’s control of passive-leaning investigators, who become more likely to try when $s = G$, and of aggressive-leaning investigators, who become more likely to drop when $s = NG$.

We note that the accountability incentives that generate this sort of investigator behavior – retaining after a conviction, removing after an acquittal, and mixing after a dropped case – are identical to the electoral incentives that voters employ in Gordon and Huber’s model. Indeed, one of the most surprising results of Gordon and Huber’s model is that even a highly passive voter would reward a prosecutor who obtains a conviction. Clearly, a parallel result does not hold in our model, as Propositions 1 and 3 imply that passive and passive-neutral executives remove investigators who take cases to trial, even if the trial produces a conviction. These contrasting predictions stem from the difference in the nature of the control problem. In Gordon and Huber, electoral incentives induce prosecutors to exert costly effort in investigating cases before bringing them to trial, and the voter is not concerned about selection problems. In contrast, our model is fundamentally driven by the executive’s concern over the preferences of the second period investigator. Hence, when he draws an adverse inference about an investigator’s type he must

\[17\text{In our model, the specific strategy played by the executive is } \sigma_C = 1, \sigma_A = 0, \text{ and } \sigma_D \in (0, 1), \text{ taking a value such that Equations 1 and 2 are satisfied.}\]
replace her. As noted by Fearon (1999), when there is a conflict between selection and optimal sanctioning, equilibrium behavior must be driven by selection concerns.

**Accountability With Extremist Replacement Available**

We now extend our baseline model to consider situations in which the executive can either choose a known ideologue as his new investigator or randomly draw a replacement from a common pool. For example, a passive president who generally favors the free market might choose either to appoint a known hard-core libertarian as his Assistant Attorney General for Antitrust, or go with a less well-known appointee. This modeling approach clearly diverges from most political models of elections or agent-selection, which assume that all potential employees are drawn from the same pool (e.g., Maskin and Tirole 2004, Canes-Wrone and Shotts 2007, Fox 2007, Banks and Duggan 2008). However, this new assumption captures a very important feature of bureaucratic politics, in that executives sometimes exert influence over the ideologies of their appointees. Moreover, it is quite plausible that due to interest-group and other political considerations, executives might constrained in their ability to control the initial appointments of their subordinates (i.e., when they are first elected to office), but are able to exert greater control at later points in time.

To illustrate this point, consider Christine Todd Whitman, President George W. Bush’s first EPA Administrator, who by most accounts was more pro-environment than the President, and was likely appointed as a way to offer an olive branch to concerned environmentalists. Given that Republicans controlled the Senate, Bush probably had sufficient latitude to appoint a more conservative Administrator to head the EPA, if he chose to do so. One wonders, then, did his ability to choose a less environmentally-friendly, i.e., more passive, appointee than Whitman enhance his control over her investigatory and enforcement activities?

In considering the historical record, Whitman’s tenure at the EPA was clearly marked by in-
cidents of conflict with the Bush Administration, as well significant criticism against Whitman, in particular, for ostensibly betraying her earlier pro-environment principles and engaging in weak enforcement efforts. It is interesting to note that her ultimate replacement was Mike Leavitt, the former governor of Utah, who received a less-than-enthusiastic welcome from numerous environmental groups, which feared that he would be even more passive in his enforcement efforts than Whitman. One could argue that Whitman actually did not betray her principles while at the EPA, but rather was responsive to constraints imposed by her principals. Hence, she chose to take somewhat-unsavory actions during her time in office, rather than surrender her position of influence to someone who would take the agency in a more passive direction.

More generally, we investigate whether the perverse effects of accountability incentives that we identified in our baseline model can be ameliorated if an executive can credibly commit to appoint a certain type of investigator when he is dissatisfied with the current investigator’s performance. To address this question more systematically, we begin by assuming that well-established ideologues, on either side of a policy issue, are always available as potential replacements. That said, we require the extremist replacement to be credible. For example, President Bush could not threaten to install Representative Dennis Kucinich (D-OH) as his new Secretary of Defense, given Kucinich’s well-known desire to create a Department of Peace and Nonviolence.

Given the option of an extremist replacement, is the executive able to exert more or less control over his investigator, compared to when there was no accountability? Furthermore, how does this level of control compare to our baseline model where the executive cannot choose a known ideologue as a replacement? Table 3 below summarizes the results. As in Table 2, a “+” indicates that equilibrium incentives increase the executive’s control over a given category of investigator, a “−” indicates decreased control, and a “0” indicates no change in control, in comparison to what would happen in the absence of accountability. For this analysis, we further subdivide the
set of neutral executives. As shown in Figure 3, there are now a total of 7 types, ordered in terms of the executive’s aggressiveness parameter, $\alpha_E$: Passive (P), Moderately-Passive-Neutral (PN1), Slightly-Passive-Neutral (PN2), Truly Neutral (TN), Slightly-Aggressive-Neutral (AN1), Moderately-Aggressive-Neutral (AN2), and Aggressive (A).

<table>
<thead>
<tr>
<th>Executive Type</th>
<th>Relevant Replacement</th>
<th>Accountability</th>
<th>Investigator Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passive (P)</td>
<td>passive</td>
<td>drop</td>
<td>0 0</td>
</tr>
<tr>
<td>Moderately-Passive-Neutral (PN1)</td>
<td>passive</td>
<td>drop</td>
<td>0 +</td>
</tr>
<tr>
<td>Slightly-Passive-Neutral (PN2)</td>
<td>random</td>
<td>drop</td>
<td>− +</td>
</tr>
<tr>
<td>Truly-Neutral (TN)</td>
<td>random</td>
<td>try iff $s = G$</td>
<td>+ +</td>
</tr>
<tr>
<td>Slightly-Aggressive-Neutral (AN1)</td>
<td>random</td>
<td>try</td>
<td>+ −</td>
</tr>
<tr>
<td>Moderately-Aggressive-Neutral (AN2)</td>
<td>aggressive</td>
<td>try</td>
<td>+ 0</td>
</tr>
<tr>
<td>Aggressive (A)</td>
<td>aggressive</td>
<td>try</td>
<td>0 0</td>
</tr>
</tbody>
</table>

As in Table 2, the potential appointment of an extremist replacement does not necessarily enhance an executive’s control over his investigator in comparison to what would occur if termination were impossible. We consider these results in more detail below. We focus first on relatively neutral executives, then the most dogmatic ones, and finally we discuss the most interesting cases, those who are Moderately-Passive-Neutral (PN1) and Moderately-Aggressive-Neutral (AN2).

**Proposition 6** If the executive is sufficiently neutral (PN2, TN, AN1), then the availability of an extreme replacement has no effect on the investigator’s equilibrium behavior in comparison to what she would do if only random replacements were available.

The intuition behind this result is straightforward. If an executive is sufficiently neutral, then
dogmatic replacements are unappealing and he thus would always prefer a randomly drawn replacement. Hence, the equilibrium is exactly the same as the equilibria characterized in Propositions 3, 4, and 5.

If the executive is non-centrist, however, the potential for an extremist replacement can induce behavior that differs from what we found in Section 5, as show in the next three propositions.

**Proposition 7** If the executive is an extremist (i.e., passive or aggressive), the availability of an extremist replacement causes the executive to have less control over investigators in the first period than what would ensue if only random replacements were available.

In contrast to the highly neutral executives, if an executive is sufficiently extreme, then he always wants to remove an incumbent investigator and install a like-minded dogmatist after the first period. Moreover, he will do this regardless of what action the incumbent takes. Because an investigator’s job security is entirely unrelated to her actions, she will simply choose the action that maximizes her first-period expected utility. As a result, in the first period, the executive possesses no more control than what he would have in the absence of accountability.

The more interesting result that emerges from this analysis is what occurs when an executive is either Moderately-Passive-Neutral (PN1) or Moderately-Aggressive-Neutral (AN2).

**Proposition 8** If an executive is moderately-passive-neutral (PN1), then the availability of an extremist (i.e., passive) replacement increases the executive’s control over aggressive-leaning investigators, yet it has no effect on the executive’s control over passive-leaning investigators.

**Proposition 9** If an executive is moderately-aggressive-neutral (AN2) then the availability of an extremist (i.e., aggressive) replacement increases the executive’s control over passive-leaning investigators, yet it has no effect on the executive’s control over aggressive-leaning investigators.
To understand the empirical domain of these results, first consider what it means for an executive to be moderately-passive-neutral (PN1). This executive prefers his investigator to be neutral, i.e., to press ahead with cases when she sees $s = G$, and drop cases when she sees $s = NG$. Yet the executive also has a passive bias in his priorities. Hence, if the investigator is going to deviate from neutrality in any way, the executive would prefer her to be passive rather than aggressive. Likewise a moderately-aggressive-neutral (AN2) executive prefers the investigator to be neutral, but if she deviates from neutrality then he would prefer her to be aggressive rather than passive.

The empirical relevance of these results is particularly noteworthy if we consider president-appointee relations. Contrary to the claims of some political pundits, modern-era presidents have been arguably neither perfectly centrist, nor clear extremists, but rather somewhat neutral with clearly-discriminable biases for, or against, different policy initiatives. If these types of executives can credibly commit to selecting an unambiguously passive investigator as a replacement for the incumbent (for example), then this option effectively gives the investigator an accountability incentive to drop any case, regardless of her signal.

The question, then, is how does this incentive influence investigator behavior? Both aggressive-leaning and passive-leaning investigators realize that they should drop all cases if they want to maximize their chances of retention, yet the desire to keep their jobs influences them differently, given their underlying preferences for aggressiveness.

This reasoning undergirds Proposition 8, for moderately-passive-neutral executives. If $s = NG$, then an aggressive-leaning investigator knows that if she drops a case in the first period, she will likely be retained for the second period, in which she can do whatever she wants (either trying a case, or dropping a case, depending on her second-period signal and $\alpha_I$). Alternatively, if she takes a first-period case to trial, she will be replaced by a passive investigator who always drops cases. For an aggressive-leaning first period investigator, the ability to influence policy in the second period
effectively trumps whatever pain she experiences in dropping a case when $s = NG$ in order to keep her job. As a result, the potential of an extremist replacement increases the executive’s control over these types of investigators when $s = NG$.

For a passive-leaning investigator, however, the accountability incentive from a moderately-passive-neutral executive in Proposition 8 is less compelling. Because she knows that her replacement will drop all cases, she knows that if she is replaced, the second-period outcome, while possibly undesirable, won’t be too bad. Hence, she will choose to always follow her signal in the first period, dropping cases when $s = NG$, and pressing ahead otherwise.

The intuition is completely analogous for Proposition 9. When an executive is moderately-aggressive-neutral (AN2), the ability to appoint a dogmatic aggressive replacement increases his control of passive-leaning investigators, who will now try cases when $s = G$, yet it has no effect on the executive’s control of aggressive-leaning investigators.

At first glance these results appear problematic for the executive: the availability of an extremist replacement does not enhance executive control for all types of investigators. Realize, however, that the set of investigators who are unaffected by the possibility of replacement is precisely the group for which executive control is less necessary given their underlying preference alignment. Many such investigators will follow their signals in the first period, which is exactly what the executive would like them to do. Moreover, unlike the baseline case, where for example, a passive-leaning executive’s increased control over one type of investigators (i.e., aggressive-neutral) necessarily comes at a cost of less control over the type of investigators most like them (i.e., passive-neutral), we see that these tradeoffs are greatly ameliorated in this extension. Certain types of executives can ensure greater control of those investigators least like them, while not causing like-minded investigators to engage in undesirable actions. In the conclusion we discuss the broader implications of this surprising result.
Conclusion

In any system of governance there is a natural tension between those who select policymakers, and those who actually implement policies. When *de facto* implementation depends on investigations, this concern is particularly pronounced, as agents can wield significant influence over the meaningfulness of law.

As we have demonstrated, a political principal’s control over investigators is profoundly related to his ability to select particular types of replacements when he is unsatisfied with an agent’s performance. When an executive has little control over the identity of the replacement, the threat of termination does not always induce the investigator to toe the line as the executive would like. To the extent that we believe that most contemporary executives are relatively moderate, our results are particularly troubling, as they suggest that the threat of termination can induce greater control over investigators with divergent preferences from the executive, but only at the cost of perverse behavior by like-minded investigators.

On the bright side, however, we demonstrate that when these executives are able to replace incumbents with established ideologues, they achieve a high level of control over divergent investigators, while not losing control over like-minded investigators. Hence, while control is not perfect, it is substantially better than what would occur if the executive was a complete victim of the randomness of the political appointment process, or was unable to terminate appointees altogether.

While these results are instructive, they are only a first step in studying the role of investigations in lawmaking processes. Indeed, we believe that one of the main contributions of this paper is simply to emphasize the fact that bureaucratic investigations are a topic worthy of much more attention, compared to what they have received so far in the scholarly literature. Regardless of the direction taken in future research, our crucial finding that an executive’s control over his investigators hinges on his ability to select certain types of replacements has several implications for the study of
appointment politics, as well as the impact of elections on bureaucratic policymaking.

If one accepts the argument that presidents are more likely able to appoint a known ideologue when their party controls the Senate, then our results point to a very subtle implication of the constitutionally-mandated appointment process. It is well accepted (e.g., Hammond and Knott 1996, Nokken and Sala 2000) that requiring Senate confirmation of presidential appointees should have nontrivial influences on their identities and policies. Our model, however, moves beyond this point to suggest that both appointee preferences and the scope of executive control over an appointee should be influenced by Senate confirmation, and particularly by which party controls the Senate. When the government is divided, the president cannot be certain of his ability to choose anything other than a random replacement, because if he selects a known ideologue the Senate may block the appointment. Thus, his level of control over an incumbent suffers, compared to what would ensue if the Senate would comply with his wishes.

Taking a step back to consider the role of voters, our findings have implications for the unintended consequences of ticket-splitting. Several scholars (e.g., Fiorina 2003) have suggested that the rise of split-ticket voting has corresponded with the polity’s increased desire to limit either party’s influence over the mechanisms of governance. Such arguments, however, have generally focused on how the party that controls the legislative branch might act as an effective check on the party that controls the executive branch, and vice versa. Implicit in these arguments is the belief that the party that controls the executive branch can effectively put forth policy agendas that might then be checked by the legislative branch, when necessary. Our results suggest that by splitting their tickets to facilitate divided government, voters might be getting their wish and ensuring that the president is not too dominant. This lack of dominance, however, might not follow from being constrained by the legislature, but rather because appointed investigators and agency heads fail to implement his goals.
References


Appendix

In this appendix we state our main technical results, along with some intuition, and show how the propositions in the main text follow from them. Full proofs of Lemmas 2-10 are in the Supplemental Appendix for Referees. We use $x \in \{T, D\}$ to denote the investigator’s decision to try or drop.

**Lemma 1** In the absence of accountability there exist cutpoints for investigator behavior, $\underline{\alpha}$ and $\overline{\alpha}$, where $0 < \underline{\alpha} < \overline{\alpha} < 1$, such that: (i) If $\alpha_I < \underline{\alpha}$, then $x = D$; (ii) If $\alpha_I \in (\underline{\alpha}, \overline{\alpha})$, then $x = D$ if $s = NG$ and $x = T$ if $s = G$; (iii) If $\alpha_I > \overline{\alpha}$, then $x = T$.

**Proof of Lemma 1.** To solve for $\underline{\alpha}$, suppose the investigator sees $s = G$ and set the investigator’s expected utility to be equal from trying versus dropping:

$$U(Try) = U(Drop)$$

$$-\gamma^G \alpha_I \rho_G - (1 - \gamma^G)(1 - \alpha_I) \rho_{NG} = -\gamma^G \alpha_I$$

$$\gamma^G \alpha_I (1 - \rho_G) - (1 - \gamma^G)(1 - \alpha_I) \rho_{NG} = 0$$

Note $U(Try) - U(Drop)$ is strictly increasing in $\alpha_I$, and solving out we get $\underline{\alpha} \equiv \frac{(1 - \gamma^G)\rho_{NG}}{\gamma^G (1 - \rho_G) + (1 - \gamma^G)\rho_{NG}}$.

Similarly, for $s = NG$, $\overline{\alpha} \equiv \frac{(1 - \gamma^NG)\rho_{NG}}{\gamma^NG (1 - \rho_G) + (1 - \gamma^NG)\rho_{NG}}$, and because $\gamma^G > \gamma^NG$ we have $\underline{\alpha} < \overline{\alpha}$.

**Results with random replacements**

**Lemma 2** There exists a cutpoint $\tilde{\alpha} \in (\underline{\alpha}, \overline{\alpha})$ such that for any executive strategy $\sigma$ it is strictly optimal for an investigator with $\alpha_I \leq \tilde{\alpha}$ to drop the first period case when $s = NG$ and it is strictly optimal for an investigator with $\alpha_I \geq \tilde{\alpha}$ to try the first period case when $s = G$.

**Lemma 3** For any executive strategy $\sigma$ there exist cutpoints $\underline{\alpha}^1$ and $\overline{\alpha}^1$, where $0 < \underline{\alpha}^1 < \tilde{\alpha} < \overline{\alpha}^1 < 1$, such that in the first period: (i) If $\alpha_I < \underline{\alpha}^1$, then $x = D$; (ii) If $\alpha_I \in (\underline{\alpha}^1, \overline{\alpha}^1)$, then $x = D$ if
s = NG and x = T if s = G; (iii) If $\alpha_1 > \overline{\alpha}_1$, then x = T; (iv) Each of the cutpoints, $\overline{\alpha}_1$ and $\overline{\alpha}_1$, is a continuous function of the executive’s strategy $\sigma$; and (v) Either $\overline{\alpha}_1 > 0$ or $\overline{\alpha}_1 < 1$.

**Intuition for Lemma 3** This result is similar to Lemma 1, but the investigator must also take into account the probability of winning re-election after trying versus dropping as well as difference in utility that she gets from having herself versus a replacement in office in the second period.

We refer to this utility difference as $W(\alpha_I)$.\(^{18}\) For example, $\overline{\alpha}_1$ is the value of $\alpha_I$ such that

\[
U(Drop) = U(Try)
\]

\[
-\gamma^G \alpha_I = -\gamma^G \alpha_I \rho_G - (1 - \gamma^G) (1 - \alpha_I) \rho_{NG} + W(\alpha_I) \{ \sigma_C \left[ \gamma^G (1 - \rho_G) + (1 - \gamma^G) \rho_{NG} \right] + \sigma_A \left[ (1 - \gamma^G) (1 - \rho_{NG}) + \gamma^G \rho_G \right] - \sigma_D \}.
\]

Part (v) of Lemma 3 implies that it is impossible for neutral executives to attain complete control over all types of investigators and that the executive’s beliefs about the incumbent investigator’s type will be affected by her choice to try or drop as well as the outcome of the trial.

**Lemma 4** If $\alpha_E \leq \alpha$ then in equilibrium $\sigma_D = 1$ and $\sigma_A = \sigma_C = 0$.

**Lemma 5** If $\alpha_E \geq \bar{\alpha}$ then in equilibrium $\sigma_D = 0$ and $\sigma_A = \sigma_C = 1$.

**Lemma 6** If first period investigator behavior is characterized by cutpoints $\underline{\alpha}_1$ and $\overline{\alpha}_1$ as in Lemma 3 then there exist cutpoints $\alpha^C$, $\alpha^D$, and $\alpha^A$ such that:

1. $\underline{\alpha} < \alpha^C \leq \alpha^D \leq \alpha^A < \overline{\alpha}$.

2. $\alpha^C$, $\alpha^D$, and $\alpha^A$ are continuous functions of $\underline{\alpha}_1$ and $\overline{\alpha}_1$.

3. If the first period case results in a conviction then an executive with $\alpha_E < \alpha^C$ strictly prefers to remove the investigator, $\alpha_E > \alpha^C$ strictly prefers to retain her, and $\alpha_E = \alpha^C$ is indifferent.

\(^{18}\) $W_R(\alpha_I)$ is a continuous function of $\alpha_I$. The difficulty of proving this lemma is that it is not a constant function.
4. If the first period case is dropped then an executive with $\alpha_E < \alpha_D$ strictly prefers to remove the investigator, $\alpha_E > \alpha_D$ strictly prefers to retain her, and $\alpha_E = \alpha_D$ is indifferent.

5. If the first period case results in an acquittal then an executive with $\alpha_E < \alpha_A$ strictly prefers to remove the investigator, $\alpha_E > \alpha_A$ strictly prefers to retain her, and $\alpha_E = \alpha_A$ is indifferent.

**Lemma 7** For any $\alpha_E$, there exists an equilibrium with one of the following types of executive behavior, each of which occurs for some values of $\alpha_E$. Also, any equilibrium must have one of these types of executive behavior: (i) $\sigma_D = 1, \sigma_C = \sigma_A = 0$; (ii) $\sigma_D = 1, \sigma_C \in (0,1), \sigma_A = 0$; (iii) $\sigma_D = 1, \sigma_C = 1, \sigma_A = 0$; (iv) $\sigma_D \in (0,1), \sigma_C = 1, \sigma_A = 0$; (v) $\sigma_D = 0, \sigma_C = 1, \sigma_A = 0$; (vi) $\sigma_D = 0, \sigma_C = 1, \sigma_A \in (0,1)$; (vii) $\sigma_D = 0, \sigma_C = 1, \sigma_A = 1$.

We now show how Propositions 1-5 in the main text follow from Lemmas 4, 5, and 7. We characterize the set of truly-neutral executives based on Lemma 7(iii). Set $\sigma_C = 1$ and $\sigma_A = 0$ and let $\bar{\sigma}_D$ and $\underline{\sigma}_D$ solve with equality Equations 1 and 2 from the main text, respectively. Let $Z = \{\alpha_E : \text{there exists an equilibrium for some } \sigma_D \in [\underline{\sigma}_D, \bar{\sigma}_D]\}$. Let $\alpha_{\underline{E}} = \min Z$ and $\alpha_E = \max Z$. Then passive-neutral executives are defined to be those with $\alpha_E \in (\underline{\alpha}, \alpha_{\underline{E}})$, truly-neutral ones have $\alpha_E \in (\alpha_{\underline{E}}, \alpha_{\bar{E}})$, and aggressive-neutral ones have $\alpha_E \in (\alpha_{\bar{E}}, \bar{\alpha})$.

We have not been able to establish equilibrium uniqueness, which would require showing that, e.g., an equilibrium from part (v), (vi), or (vii) of Lemma 7 cannot exist for $\alpha_E < \alpha_{\bar{E}}$. However, we do know that only for truly-neutral executives, i.e., $\alpha_E \in (\alpha_{\underline{E}}, \alpha_{\bar{E}})$, can there be an equilibrium that satisfies both Equations 1 and 2 so that the executive achieves increased control over both passive-leaning and aggressive-leaning investigators. When such an equilibrium exists, that is the one we characterize. For $\alpha_E \in (\underline{\alpha}, \alpha_{\bar{E}})$ we characterize equilibria in which investigators are rewarded for

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To see that $\underline{\alpha} < \alpha_{\underline{E}}$, note that regardless of the investigator’s first period behavior, from Lemma 6 an executive with $\alpha_E = \underline{\alpha}$ strictly prefers to retain the investigator after a dropped case. Thus for a neighborhood of $\alpha_E$ close to $\underline{\alpha}$ only the equilibrium in Lemma 7(i) exists. A similar argument establishes that $\alpha_{\bar{E}} < \bar{\alpha}$. 37
dropping cases. Likewise, for $\alpha_E \in (\alpha_E, \bar{\alpha})$ we characterize equilibria in which investigators are rewarded for trying cases.

Proposition 1 in the main text is based on Lemma 4 and Proposition 2 is based on Lemma 5. Proposition 3 is based on Lemma 7(i)-(iii) and (iv) with $\sigma_D > \bar{\sigma}_D$. Proposition 4 is based on Lemma 7(v)-(vii) and (iv) with $\sigma_D < \bar{\sigma}_D$. Proposition 5 covers all values of $\alpha_E \in (\alpha_E, \alpha_E)$, for which there exists an equilibrium with $\sigma_D \in (\bar{\sigma}_D, \bar{\sigma}_D)$ in Lemma 7(iv).

The propositions also characterize investigators’ incentives to try or drop cases, which are straightforward to confirm, based on the equilibrium executive strategy $\sigma$ and Equations 1 and 2.

**Lemma 8** In the equilibria that we characterize for passive and passive-neutral executives $\alpha^1 > \alpha$ and $\bar{\alpha}^1 > \bar{\alpha}$. For truly neutral executives $\alpha^1 < \alpha$ and $\bar{\alpha}^1 > \bar{\alpha}$. For aggressive and aggressive-neutral executives $\alpha^1 < \alpha$ and $\bar{\alpha}^1 < \bar{\alpha}$.

**Intuition for Lemma 8** As can be seen from Equation 4, accountability affects first-period investigator behavior in obvious ways. For example, if the investigator has an incentive to try when $s = G$, i.e., $\sigma_C \left[ \gamma^G (1 - \rho_G) + (1 - \gamma^G) \rho_{NG} \right] + \sigma_A \left[ (1 - \gamma^G) (1 - \rho_{NG}) + \gamma^G \rho_G \right] - \sigma_D > 0$, then $\alpha^1 < \alpha$, whereas if she has an incentive to drop then $\alpha^1 > \alpha$. Likewise, if she has an incentive to try when $s = NG$ then $\bar{\alpha}^1 < \bar{\alpha}$ whereas if she has an incentive to drop then $\bar{\alpha}^1 > \bar{\alpha}$.

**Control** To characterize how accountability affects control, we need a precise definition of control. Control is determined by comparing first period equilibrium investigator behavior, as characterized by the cutpoints $\alpha^1$ and $\bar{\alpha}^1$, versus what would happen in the absence of accountability, as characterized by the cutpoints $\alpha$ and $\bar{\alpha}$. Because $\alpha^1 < \bar{\alpha} < \bar{\alpha}^1$, from Lemma 2 we know that for passive-leaning investigators, i.e., those with $\alpha_I < \bar{\alpha}$, only $\alpha^1$ is relevant to an assessment of control because regardless of accountability incentives all passive-leaning investigators pick $x = D$ when $s = NG$. Likewise for aggressive-leaning investigators, i.e., those with $\alpha_I > \bar{\alpha}$, only $\bar{\alpha}^1$ is of inter-
est because all aggressive-leaning investigators pick \( x = T \) when \( s = G \). Applying the following definition to the results from Lemma 8 yields the conclusions regarding control in Propositions 1-5.

**Definition 1** The effect of accountability on control is as follows:

1. A passive executive’s control over passive-leaning investigators increases if \( \bar{\alpha}^1 > \alpha \) and decreases if \( \bar{\alpha}^1 < \alpha \). His control over aggressive-leaning investigators increases if \( \bar{\alpha}^1 > \bar{\alpha} \) and decreases if \( \bar{\alpha}^1 < \bar{\alpha} \).

2. A neutral executive’s control over passive-leaning investigators increases if \( \alpha^1 < \alpha \) and decreases if \( \alpha^1 > \alpha \). His control over aggressive-leaning investigators increases if \( \bar{\alpha}^1 > \bar{\alpha} \) and decreases if \( \bar{\alpha}^1 < \bar{\alpha} \).

3. An aggressive executive’s control over passive-leaning investigators increases if \( \alpha^1 < \alpha \) and decreases if \( \alpha^1 > \alpha \). His control over aggressive-leaning investigators increases if \( \bar{\alpha}^1 < \bar{\alpha} \) and decreases if \( \bar{\alpha}^1 > \bar{\alpha} \).

**Results with extreme replacements available**

We first analyze whether the executive prefers an extreme replacement over a random draw.

**Lemma 9** There exist cutpoints \( \underline{\alpha}^{ER} \) and \( \overline{\alpha}^{ER} \), where \( \alpha < \underline{\alpha}^{ER} < \alpha_E < \alpha^1 < \overline{\alpha}^{ER} < \bar{\alpha} \), such that the executive’s most preferred replacement is: (i) passive if \( \alpha_E < \underline{\alpha}^{ER} \), (ii) random if \( \alpha_E \in (\underline{\alpha}^{ER}, \overline{\alpha}^{ER}) \), and (iii) aggressive if \( \alpha_E > \overline{\alpha}^{ER} \).

Given this lemma, for \( \alpha_E \in (\underline{\alpha}^{ER}, \overline{\alpha}^{ER}) \), which comprises PN2, TN, and AN1 executives in Proposition 6, the existence of extremist replacements is irrelevant, and equilibria are exactly the same as in the model where only a random replacement is available.
The proof of Proposition 7 in the main text is trivial. For example, for \( \alpha_E < \bar{\alpha} \) the executive wants all cases to be dropped, so regardless of what the investigator does in the first period he is strictly better off replacing her with someone known to be passive. Because her first-period behavior has no effect on her chances of being retained, the investigator chooses her own most-preferred action in the first period, as in Lemma 1. Thus the executive has less control over the investigator than he did in Proposition 1. For \( \alpha_E > \bar{\alpha} \) the argument is similar.

What remains is to prove Propositions 8 and 9, for PN1 and AN2 executives, in \((\alpha, \alpha^{ER})\) and \((\bar{\alpha}^{ER}, \bar{\alpha})\), respectively.

**Lemma 10** Equilibria for PN1 and AN2 executives.

1. For \( \alpha_E \in (\overline{\alpha}, \alpha^{ER}) \), there exists an equilibrium in which \( \sigma_D \in (0, 1) \) and \( \sigma_A = \sigma_C = 0 \). First period investigator behavior is characterized by cutpoints \( \overline{\alpha}^1 = \overline{\alpha} \) and \( \bar{\alpha}^1 > \bar{\alpha} \).

2. For \( \alpha_E \in (\bar{\alpha}^{ER}, \bar{\alpha}) \), there exists an equilibrium in which \( \sigma_D = 0 \) and \( \sigma_A = \sigma_C \in (0, 1) \). First period investigator behavior is characterized by cutpoints \( \alpha^1 < \overline{\alpha} \) and \( \bar{\alpha}^1 = \bar{\alpha} \).

**Intuition for Lemma 10** The equilibrium construction for a PN1 executive is as follows. (The case of an AN2 executive is similar). For any \( \alpha_E \in (\alpha, \alpha^{ER}) \) find \( \alpha^1 \in (\bar{\alpha}, 1) \), such that if first period investigator behavior is characterized by \( \alpha^1 = \overline{\alpha} \) and \( \bar{\alpha}^1 > \bar{\alpha} \) then when \( x = D \) the executive is indifferent between retaining the investigator and installing a dogmatic passive replacement. Then find \( \sigma_D \in (0, 1) \) that, along with \( \sigma_A = \sigma_C = 0 \), induces investigators to behave according to cutpoint \( \bar{\alpha}^1 \) when \( s = NG \).

The intuition for why investigators’ behavior is optimal is as follows. Passive investigators, with \( \alpha_I < \alpha \) have no accountability incentives (the replacement is passive) so they do exactly what they want to do in the first period, dropping the case. Neutral investigators drop if and only if they see \( s = NG \). Obviously if they see \( s = NG \) they want to drop for retention reasons, and because that
is what they want to do anyway. More interesting is what happens if they see $s = G$. A neutral investigator is always better off trying when $s = G$. The replacement is passive, so she knows that even if trying leads to removal, the only way the new investigator's behavior could differ from her own in the second period is if there is a guilty signal. So it is better to take the first period case to trial, and hope that if she thereby loses office there is no effect on second period policy.

Because $\alpha^1 = \alpha$, accountability has no effect on the PN1 executive’s control over passive-leaning investigators. Because $\bar{\alpha}^1 > \bar{\alpha}$, the executive, who is neutral and wants the investigator to follow her signal, has increased control over aggressive-leaning investigators.
Figure 1: Extensive Form
Figure 2: Investigator types, as a function of aggressiveness parameter
Figure 3: Executive types

Note: the distinction between PN1 versus PN2 and AN1 versus AN2 executives is only relevant in the model with extremist replacements available.
Supplemental Appendix for Referees

This appendix for referees and interested readers will be posted online if our paper is published.

We denote the investigator’s strategy in the first period as \( \tau^1(\alpha_I, s) : [0, 1] \times \{G, NG\} \rightarrow \{T, D\} \). Similarly for the second period investigator \( \tau^2(\alpha, s) : [0, 1] \times \{G, NG\} \rightarrow \{T, D\} \). Let \( \mu_p(A) \) denote the executive’s belief about the probability that the incumbent investigator is passive \((\alpha_I < \underline{\alpha})\), when she takes the first period case to trial and it is acquitted. Likewise let \( \mu_n(A) \) denote the probability that \( \alpha_I > \bar{\alpha} \) after an acquittal. Similarly for a conviction or drop.

Define the probability that a random replacement is passive, neutral, or aggressive as \( \rho = \frac{F(\alpha)}{F(\alpha) + F(\bar{\alpha})} \) and \( a = 1 - \frac{F(\alpha)}{F(\alpha) + F(\bar{\alpha})} \). Finally, given signal \( s \) we denote the difference between the probability that the investigator is retained after trying and the probability that the investigator is retained after dropping as

\[
 r(s) \equiv \sigma_C \left[ \gamma^s (1 - \rho_G) + (1 - \gamma^s) \rho_{NG} \right] + \sigma_A \left[ (1 - \gamma^s) (1 - \rho_{NG}) + \gamma^s \rho_G \right] - \sigma_D. \tag{5}
\]

Note that if \( r(s) > 0 \) the investigator has an accountability incentive to try whereas for \( r(s) < 0 \) she has an incentive to drop.

**Proof of Lemma 2** An investigator sees either \( s = G \) or \( s = NG \). In terms of the utility received from the case in a given period, which we calculate the same way as in Lemma 1, one of these information sets is more important to the investigator in the following sense.

A passive investigator cares more about dropping a case when \( s = NG \) than she does when \( s = G \), i.e., using the reasoning from Equation 3, for any \( \alpha_I < \underline{\alpha} \), \( U(Drop|s = NG) - U(Try|s = NG) > U(Drop|s = G) - U(Try|s = G) \) because

\[
 -\gamma^{NG} \alpha_I (1 - \rho_G) + (1 - \gamma^{NG}) (1 - \alpha_I) \rho_{NG} > -\gamma^{G} \alpha_I (1 - \rho_G) + (1 - \gamma^{G}) (1 - \alpha_I) \rho_{NG}
\]

\[
 (\gamma^{G} - \gamma^{NG}) [\alpha_I (1 - \rho_G) + (1 - \alpha_I) \rho_{NG}] > 0.
\]

The last expression holds because \( \gamma^{G} > \gamma^{NG} \).
Similarly, an aggressive investigator cares more about trying rather than dropping when \( s = G \) than when \( s = NG \), i.e., for \( \alpha_I > \bar{\pi}, U(Try|s = G) - U(Drop|s = G) > U(Try|s = NG) - U(Drop|s = NG) \).

For a neutral investigator we solve for \( \tilde{\alpha} \) such that the investigator is indifferent in terms of which decision is more important, i.e., for \( I > 0 \); \( U(Try|s = G) \geq U(Drop|s = G) \) and \( U(Try|s = NG) \leq U(Drop|s = NG) \):

\[
\gamma^G \alpha_I (1 - \rho_G) - (1 - \gamma^G) (1 - \alpha_I) \rho_{NG} = -\gamma^{NG} \alpha_I (1 - \rho_G) + (1 - \gamma^{NG}) (1 - \alpha_I) \rho_{NG}
\]

\[
\alpha_I [(\gamma^G + \gamma^{NG}) (1 - \rho_G) + (2 - \gamma^{NG} - \gamma^G) \rho_{NG}] = (2 - \gamma^{NG} - \gamma^G) \rho_{NG}
\]

\[
\hat{\alpha} = \frac{(2 - \gamma^{NG} - \gamma^G) \rho_{NG}}{(\gamma^G + \gamma^{NG}) (1 - \rho_G) + (2 - \gamma^{NG} - \gamma^G) \rho_{NG}}.
\]

It is straightforward to confirm that \( \underline{\alpha} < \hat{\alpha} < \bar{\pi} \). We still need to establish that for \( \alpha_I \leq \hat{\alpha} \) it is optimal to drop in the first period when \( s = NG \) and for \( \alpha_I > \hat{\alpha} \) it is optimal to try in the first period when \( s = G \), regardless of accountability incentives. To do this, we find bounds on how much the investigator’s first period actions can affect her utility from second period actions. For \( \alpha_I \leq \hat{\alpha} \), the largest possible difference between a investigator’s expected utility from her own choice of whether to try when retained versus a replacement investigator’s choice occurs when \( s = NG \) in the second period. She can potentially lose up to \( U(Drop|s = NG) - U(Try|s = NG) \) if the replacement is aggressive. However, the probability of this occurring is strictly less than \( 1 \), because there is some chance that the second period signal is \( s = G \) and there is also some probability that the replacement is not aggressive. Thus a strict upper bound on the investigator’s expected second period utility loss from choosing \( x = T \) when \( s = NG \) in the first period is \( U(Drop|s = NG) - U(Try|s = NG) \). Because the investigator’s first period utility difference between trying and dropping is \( U(Drop|s = NG) - U(Try|s = NG) \) it is thus strictly optimal for her to drop the case in the first period. For \( \alpha_I \geq \hat{\alpha} \), a symmetric argument shows that it is strictly optimal to chose \( x = T \) when \( s = G \) in the first period.

**Proof of Lemma 3** We characterize \( \underline{\alpha}_I \), the cutpoint for first period investigator behavior when \( s = G \). The argument for \( \bar{\pi}_I \) is essentially similar, except using \( s = NG \). First note that, from Lemma 2, any
investigator with $\alpha_I \geq \bar{\alpha}$ strictly prefers to try when $s = G$. There are three cases, based on the difference in probability of retention from trying versus dropping after a guilty signal: $r(G) = 0$, $r(G) > 0$, and $r(G) < 0$.

**Case 1:** $r(G) = 0$. First period actions don’t affect the investigator’s retention probability when $s = G$, so $\alpha^{-1} = \bar{\alpha}$, i.e., she chooses her most preferred action.

**Case 2:** $r(G) > 0$. Any investigator with $\alpha_I \geq \bar{\alpha}$ strictly prefers to try. That’s what she wants to do anyway in the first period and doing so increases the chance that she will be retained, which strictly increases her utility in the second period.

To characterize the behavior of investigators with $\alpha_I < \bar{\alpha}$, we find an investigator’s utility difference from trying versus dropping, which we will denote as $U_{TD}(\alpha_I; s, r(s))$.

The first component of $U_{TD}(\alpha_I; G, r(G))$ is just the first period utility difference from the two actions, which, as in Equation 3, is $\alpha_I \gamma^G (1 - \rho_G) - (1 - \alpha_I) (1 - \gamma^G) \rho_{NG}$.

The second component is the second period effect of her first period action. The difference between her probability of being retained if she tries and her probability of being retained if she drops is $r(G)$. If a passive investigator is replaced, there is an increased chance of an incorrect conviction in the second period, which results in $-(1 - \alpha_I)$ utility for the investigator. Specifically, it may be the case that the replacement investigator is a neutral type who mistakenly observes $s = G$ when the defendant is innocent and thus brings the case to trial (which the passive investigator wouldn’t do) and the trial produces a mistaken outcome. The probability of this happening is $\phi_n (1 - q) (1 - \pi) \rho_{NG}$. Or it may be the case that the replacement is aggressive, the defendant is innocent, and the trial produces a mistaken outcome. The probability of this happening is $\phi_a (1 - \pi) \rho_{NG}$.

If the passive investigator is replaced, there is also a decreased chance of a correct second period conviction, which counts for $-\alpha_I$ utility. Specifically, the replacement investigator may be a neutral type who correctly observes $s = G$ when the defendant is guilty, brings the case to trial, and receives a correct trial outcome. The probability of this happening is $\phi_n q \pi (1 - \rho_G)$. Or it may be the case that the replacement
is aggressive, the defendant is guilty, and the trial produces a correct outcome. The probability of this happening is \( \phi_a \pi (1 - \rho_G) \).

Combining all of these terms, for a passive investigator, i.e., \( \alpha_I \leq \alpha^1 \):

\[
U_{TD}(\alpha_I; G, r(G)) = \alpha_I \gamma^G (1 - \rho_G) - (1 - \alpha_I) \left( 1 - \gamma^G \right) \rho_{NG}
+ r(G) (1 - \alpha_I) (1 - \pi) \rho_{NG} [\phi_n (1 - q) + \phi_a]
- r(G) \alpha_I \pi (1 - \rho_G) [\phi_n q + \phi_a]
= \rho_{NG} \{ r(G) (1 - \pi) [\phi_n (1 - q) + \phi_a] - (1 - \gamma^s) \}
+ \alpha_I (1 - \rho_G) (\gamma^G - r(G) \pi [\phi_n q + \phi_a])
+ \alpha_I \rho_{NG} \left( (1 - \gamma^G) - r(G) (1 - \pi) [\phi_n (1 - q) + \phi_a] \right).
\]

Focusing on the last two lines of this expression, we see that for \( \alpha_I \in [0, \alpha] \), \( U_{TD}(\alpha_I; s, r(s)) \) is a linear function of \( \alpha_I \). Obviously, for \( r(G) > 0 \), \( U_{TD}(\alpha; G, r(G)) > 0 \), i.e., an investigator who is indifferent between trying and dropping in terms of first period outcomes when \( s = G \) strictly prefers to try when doing so increases the probability that she is retained. Because \( U_{TD}(\alpha_I; G, r(G)) \) is linear in \( \alpha_I \) this means there are two possible situations. First, it may be the case that \( U_{TD}(0; G, r(G)) > 0 \), in which case all investigators with \( \alpha_I \in [0, \alpha] \) strictly prefer to try when \( s = G \); in this case \( \alpha^1 = 0 \). Second, it may be the case that for some \( \alpha^1 \in (0, \alpha) \), \( U_{TD}(\alpha^1; G, r(G)) = 0 \), in which case \( U_{TD}(\alpha_I; G, r(G)) \) must be strictly increasing in \( \alpha_I \) (because \( U_{TD}(\alpha; G, r(G)) > 0 \)) and hence all investigators with \( \alpha_I < \alpha^1 \) strictly prefer to drop when \( s = G \) and those with \( \alpha_I > \alpha^1 \) strictly prefer to try. Setting \( U_{TD}(\alpha_I; G, r(G)) = 0 \) and solving out yields

\[
\alpha^1 = \frac{\rho_{NG} \left[ (1 - \gamma^G) - r(G) (1 - \pi) [\phi_n (1 - q) + \phi_a] \right]}{\rho_{NG} \left[ (1 - \gamma^G) - r(G) (1 - \pi) [\phi_n (1 - q) + \phi_a] \right] + (1 - \rho_G) \left( \gamma^G - r(G) \pi [\phi_n q + \phi_a] \right)}.
\]

Note that for \( r(G) > 0 \), \( \alpha^1 \) is a continuous function of \( r(G) \).

**Case 3:** \( r(G) < 0 \). In this case, a passive investigator obviously will not try a case. For a neutral
investigator, the utility difference between trying versus dropping is

\[ U_{TD}(\alpha_I; G, r(G)) = \alpha_I \gamma^G (1 - \rho_G) - (1 - \alpha_I) (1 - \gamma^G) \rho_{NG} \]

\[ + r(G) (1 - \alpha_I) (1 - \pi) \rho_{NG} [\phi_a q - \phi_p (1 - q)] \]

\[ + r(G) \alpha_I \pi (1 - \rho_G) [\phi_p q - \phi_a (1 - q)] \]

\[ = \rho_{NG} \{ r(G) (1 - \pi) [\phi_a q - \phi_p (1 - q)] - (1 - \gamma^G) \} \]

\[ + \alpha_I (1 - \rho_G) \{ \gamma^G + r(G) \pi [\phi_p q - \phi_a (1 - q)] \} \]

\[ + \alpha_I \rho_{NG} \{ (1 - \gamma^G) - r(G) (1 - \pi) [\phi_a q - \phi_p (1 - q)] \} . \]

Note that this expression is linear in \( \alpha_I \). Moreover, it is strictly increasing because an investigator at \( \alpha_I \) strictly prefers to drop and, from Lemma 2, an investigator at \( \tilde{\alpha} \) strictly prefers to try when \( s = G \). Thus for \( r(G) < 0 \), there is a unique solution \( \alpha^1 \in (\alpha, \tilde{\alpha}) \), which is a continuous function of \( r(G) \):

\[
\alpha^1 = \frac{\rho_{NG} \{ (1 - \gamma^G) - r(G) (1 - \pi) [\phi_a q - \phi_p (1 - q)] \}}{\rho_{NG} \{ (1 - \gamma^G) - r(G) (1 - \pi) [\phi_a q - \phi_p (1 - q)] \} + \rho_{NG} \{ \gamma^G + r(G) \pi [\phi_p q - \phi_a (1 - q)] \} .
\]

For part (iv) of Lemma 3, note that as \( r(G) \to 0 \), the right hand side of Equations 6 and 7 both converge to \( \frac{\rho_{NG}(1-\gamma^G)}{\rho_{NG}(1-\gamma^G)+(1-\rho_G)\gamma^G} \), i.e., \( \alpha^1 \), so \( \alpha^1 \) is a continuous function of \( r(G) \). From Equation 5 it is obvious that \( r(G) \) is a continuous function of the executive’s strategy \( \sigma \), so \( \alpha^1 \) is also a continuous function of \( \sigma \).

For part (v) of Lemma 3, we assume that \( \alpha^1 = 0 \) and \( \overline{\alpha}^1 = 1 \) then derive a contradiction.

Assume that \( \alpha^1 = 0 \), and note that an investigator with \( \alpha_I = 0 \) cares only about avoiding mistaken convictions. If she tries the case in the first period when \( s = G \), this will lead to \( (1 - \gamma^G) \rho_{NG} \) mistaken convictions. On the other hand, by trying the case, she changes her probability of retention by \( r(G) \), and if retained, she will avoid mistaken convictions in two circumstances: her replacement is neutral and receives an incorrect signal about an innocent defendant who is then mistakenly convicted, or her replacement is aggressive, the defendant is innocent, and the defendant is mistakenly convicted. For the investigator at
\[ \alpha_I = 0 \] to try when \( s = G \) requires that

\[
(1 - \gamma^G) \rho_{NG} \leq r(G) [\phi_n (1 - \pi) (1 - q) \rho_{NG} + \phi_a (1 - \pi) \rho_{NG}]
\]

\[
\frac{(1 - \pi) (1 - q)}{\pi q + (1 - \pi) (1 - q)} \leq r(G) [\phi_n (1 - \pi) (1 - q) + \phi_a (1 - \pi)]
\]

\[
\frac{1 - q}{\pi (1 - q) + (1 - \pi) q} \leq r(G).
\]

Substituting in \( r(G) = \sigma_C [\gamma^G (1 - \rho_G) + (1 - \gamma^G) \rho_{NG}] + \sigma_A [(1 - \gamma^G) (1 - \rho_{NG}) + \gamma^G \rho_G] - \sigma_D \) from

Equation 5, and rearranging terms this reduces to

\[
\sigma_D \leq \sigma_C [\gamma^G (1 - \rho_G) + (1 - \gamma^G) \rho_{NG}] + \sigma_A [(1 - \gamma^G) (1 - \rho_{NG}) + \gamma^G \rho_G]
\]

Assume also that \( \overline{\pi}^1 = 1 \). An investigator for whom \( \alpha_I = 1 \) cares only about ensuring conviction of the guilty, so for her to drop when \( s = NG \) the number of foregone correct first period convictions must be less than the expected decrease in the number of second-period convictions if she drops the first period case:

\[
\gamma^{NG} (1 - \rho_G) \leq -r(NG) [\phi_p \pi (1 - \rho_G) + \phi_n \pi (1 - q) (1 - \rho_G)]
\]

\[
\frac{\pi (1 - q)}{\pi (1 - q) + (1 - \pi) q} \leq -r(NG) [\phi_p \pi + \phi_n \pi (1 - q)]
\]

\[
\frac{1 - q}{\pi (1 - q) + (1 - \pi) q} \leq -r(NG).
\]

Substituting in \( r(NG) = \sigma_C [\gamma^{NG} (1 - \rho_G) + (1 - \gamma^{NG}) \rho_{NG}] + \sigma_A [(1 - \gamma^{NG}) (1 - \rho_{NG}) + \gamma^{NG} \rho_G] - \sigma_D \)

from Equation 5, and rearranging terms this reduces to

\[
\sigma_C [\gamma^{NG} (1 - \rho_G) + (1 - \gamma^{NG}) \rho_{NG}] + \sigma_A [(1 - \gamma^{NG}) (1 - \rho_{NG}) + \gamma^{NG} \rho_G] \leq \sigma_D.
\]

Because the same value of \( \sigma_D \) must satisfy Equations 8 and 9, to have \( \alpha^1 = 0 \) and \( \overline{\alpha}^1 = 1 \) requires that

\[
\sigma_C [\gamma^{NG} (1 - \rho_G) + (1 - \gamma^{NG}) \rho_{NG}] + \sigma_A [(1 - \gamma^{NG}) (1 - \rho_{NG}) + \gamma^{NG} \rho_G] \leq \sigma_C [\gamma^G (1 - \rho_G) + (1 - \gamma^G) \rho_{NG}]
\]

\[
+ \frac{(1 - q)}{\pi (1 - q) + (1 - \pi) q} \cdot \frac{1 - q}{\phi_p + \phi_n (1 - q)}
\]

\[
+ \frac{1 - q}{\pi q + (1 - \pi) (1 - q) \phi_p + \phi_n (1 - q) + \phi_a}
\]

\[
\leq (\gamma^G - \gamma^{NG}) (1 - \rho_G - \rho_{NG}) (\sigma_C - \sigma_A).
\]
Note that the right hand side is strictly less than 1, so a necessary condition for \( \alpha^1 = 0 \) and \( \bar{\alpha}^1 = 1 \) is
\[
\frac{1}{\pi (1-q) + (1-\pi) q} \cdot \frac{1 - q}{\phi_p + \phi_n (1-q)} + \frac{1}{\pi q + (1-\pi)(1-q)} \cdot \frac{1 - q}{\phi_n (1-q) + \phi_a} < 1.
\]

Using the fact that with a uniform distribution of investigator types \( \phi_p = F(\alpha) = \alpha, \phi_n = F(\bar{\alpha}) - F(\alpha) = \bar{\alpha} - \alpha \), and \( \phi_a = 1 - F(\bar{\alpha}) = 1 - \bar{\alpha} \), this can be re-written as
\[
\frac{1}{\pi (1-q) + (1-\pi) q} \cdot \frac{1 - q}{q \alpha + (1-q) \bar{\alpha}} + \frac{1}{\pi q + (1-\pi)(1-q)} \cdot \frac{1 - q}{q (1-\bar{\alpha}) + (1-q) (1-\alpha)} < 1. \tag{10}
\]

To simplify Equation 10, we work on each of the terms \( \frac{1 - q}{q \alpha + (1-q) \bar{\alpha}} \) and \( \frac{1 - q}{q (1-\bar{\alpha}) + (1-q) (1-\alpha)} \), using the expressions derived in the proof of Lemma 1:
\[
\alpha = \frac{(1 - \gamma G) \rho_{NG}}{\gamma G (1-\rho_G) + (1 - \gamma G) \rho_{NG}} = \frac{\pi q}{\pi q + (1-\pi)(1-q) \rho_{NG}} \frac{(1-\pi)(1-q) \rho_{NG}}{\pi q (1-\rho_G) + (1-\pi)(1-q) \rho_{NG}} \frac{1}{\rho_{NG}},
\]
and
\[
\bar{\alpha} = \frac{(1 - \gamma NG) \rho_{NG}}{\gamma NG (1-\rho_G) + (1 - \gamma NG) \rho_{NG}} = \frac{\pi q}{\pi q (1-\rho_G) + (1-\pi) q \rho_{NG}} \frac{1}{\rho_{NG}}.
\]

Substituting for \( \alpha \) and \( \bar{\alpha} \) and simplifying yields
\[
\frac{1 - q}{q \alpha + (1-q) \bar{\alpha}} = \frac{1}{(1-\pi) q \rho_{NG}} \frac{1}{\pi q (1-\rho_G) + (1-\pi)(1-q) \rho_{NG}} + \frac{1}{\pi (1-q) (1-\rho_G) + (1-\pi) q \rho_{NG}}. \tag{11}
\]

and
\[
\frac{1 - q}{q (1-\bar{\alpha}) + (1-q) (1-\alpha)} = \frac{1}{\pi q (1-\rho_G)} \frac{1}{\pi q (1-\rho_G) + (1-\pi) q \rho_{NG}} + \frac{1}{\pi q (1-\rho_G) + (1-\pi)(1-q) \rho_{NG}}. \tag{12}
\]

Substituting in Equations 11 and 12 into Equation 10 yields
\[
\left[ \frac{\pi q (1-q) + (1-\pi) q}{\pi q (1-\rho_G) + (1-\pi) q \rho_{NG}} + \frac{1}{\pi q (1-\rho_G) + (1-\pi)(1-q) \rho_{NG}} \cdot \frac{1}{\pi q (1-\rho_G)} \right] < 1.
\]
Multiplying out the second term on the left hand side, this requires that
\[
\frac{1}{\pi q (1 - q) (1 - \rho_G) + (1 - \pi) q \rho_{NG}} < \frac{1}{\pi (1 - q) (1 - \pi) q \rho_{NG}} + \frac{1}{\pi (1 - q) (1 - \pi) q \rho_{NG}}.
\]
However, breaking this into two separate inequalities, we see that the inequality cannot hold. Specifically,
\[
\frac{1}{\pi (1 - q) + (1 - \pi) q} \cdot \frac{1}{(1 - \pi) q \rho_{NG}} > \frac{1}{\pi (1 - q) + (1 - \pi) q \rho_{NG}}
\]
\[
\pi (1 - q) (1 - \rho_G) + (1 - \pi) q \rho_{NG} > \pi (1 - q) + (1 - \pi) q
\]
and
\[
\frac{1}{\pi q + (1 - \pi) (1 - q)} \cdot \frac{1}{\pi q (1 - \rho_G)} > \frac{1}{\pi q (1 - \rho_G) + (1 - \pi) (1 - q) \rho_{NG}}
\]
\[
\pi q (1 - \rho_G) + (1 - \pi) (1 - q) \rho_{NG} > [\pi q + (1 - \pi) (1 - q)] \pi q (1 - \rho_G)
\]
\[
1 + \frac{(1 - \pi) (1 - q) \rho_{NG}}{\pi q (1 - \rho_G)} > \pi q + (1 - \pi) (1 - q),
\]
where the last line of each of these inequalities holds because \( \pi \in (0, 1) \) and \( q \in (0, 1) \), so \( 1 > \pi (1 - q) + (1 - \pi) q \) and \( 1 > \pi q + (1 - \pi) (1 - q) \). Thus we have reached a contradiction.

**Proof of Lemmas 4 and 5** The proof of these lemmas is based on the fact that for any cutpoints \( \alpha^1 \) and \( \overline{\alpha}^1 \) an executive who is either passive or aggressive has a strict incentive to retain or remove the investigator, based solely on her decision to try or drop the case in the first period.

There are four cases to consider: (i) \( \alpha^1 < \alpha \) and \( \overline{\alpha}^1 < \overline{\alpha} \), (ii) \( \alpha^1 > \alpha \) and \( \overline{\alpha}^1 > \overline{\alpha} \), (iii) \( \alpha^1 < \alpha \) and \( \overline{\alpha}^1 > \overline{\alpha} \), (iv) \( \alpha^1 > \alpha \) and \( \overline{\alpha}^1 < \overline{\alpha} \). We show below that in each of these four cases, after the first period policy outcome is revealed, executive beliefs about the probability that the incumbent investigator is passive can be ordered as follows: \( \mu_p(D) > \phi_p > \mu_p(C) \geq \mu_p(A) \). Because the first period outcome must be \( A, C \) or \( D \), \( \phi_p \) is a weighted average of \( \mu_p(A), \mu_p(C) \), and \( \mu_p(D) \). Thus it is sufficient to prove that \( \phi_p > \mu_p(C) \geq \mu_p(A) \) and \( \mu_p(D) > \phi_p \) follows. Similarly for beliefs about the probability that the investigator is aggressive, we show that \( \phi_a < \mu_a(C) \leq \mu_a(A) \) so that \( \mu_a(D) < \phi_a < \mu_a(C) \leq \mu_a(A) \).

For a passive executive, a passive investigator produces the highest expected utility and an aggressive
investigator produces the lowest expected utility in the second period. If \( D \) is the first period outcome then the probability of the best type is greater than the prior and the probability of the worst type is lower than the prior. Thus it is strictly optimal to retain, setting \( \sigma_D = 1 \). On the flip side, if \( C \) is the first period outcome, then \( \phi_p > \mu_p(C) \) and \( \phi_a < \mu_a(C) \), so it is strictly optimal to remove the investigator, setting \( \sigma_C = 0 \). Likewise \( \sigma_A = 0 \) is optimal. Because our analysis allows for any \( \alpha \) and \( \overline{\alpha} \), except for the case of \( \alpha = 0 \) and \( \overline{\alpha} = 1 \) which we ruled out in Lemma 3(v) we thus establish a unique equilibrium for the case of a passive executive. A similar argument establishes that for an aggressive executive there is a unique equilibrium because for any \( \alpha \) and \( \overline{\alpha} \) it is optimal to set \( \sigma_D = 0 \), and \( \sigma_C = \sigma_A = 1 \).

We now give the details of the executive’s beliefs in cases (i)-(iv).

For case (i),

\[
\mu_p(A) = \frac{[F(\alpha) - F(\overline{\alpha})] Pr(s=G) Pr(T=A|s=G)}{[1 - F(\overline{\alpha})] Pr(s=G) Pr(T=A|s=G) + [1 - F(\overline{\alpha})] Pr(s=NG) Pr(T=A|s=NG)} \quad \text{and} \quad \mu_p(C) = \frac{[F(\alpha) - F(\overline{\alpha})] Pr(s=G) Pr(T=C|s=G)}{[1 - F(\overline{\alpha})] Pr(s=G) Pr(T=C|s=G) + [1 - F(\overline{\alpha})] Pr(s=NG) Pr(T=C|s=NG)}. \]

We show that \( \mu_p(A) < \mu_p(C) \), by multiplying out these two expressions, and cancelling terms to get

\[
Pr(T = C|s = NG) Pr(T = A|s = G) < Pr(T = A|s = G) Pr(T = C|s = G). \tag{13}
\]

Expanding out Equation 13, we need

\[
\begin{aligned}
\gamma^{NG}(1 - \rho_G) + (1 - \gamma^{NG}) \rho_{NG} & < [\gamma^{NG} \rho_G + (1 - \gamma^{NG})(1 - \rho_{NG})] \\
\gamma^{NG}(1 - \rho) + (1 - \gamma^{NG})(1 - \rho_{NG}) & < [\gamma^{N}G(1 - \rho) + (1 - \gamma^{NG}) \rho_{NG}]
\end{aligned}
\]

\[
\gamma^{NG}(1 - \rho_G)(1 - \gamma^{G})(1 - \rho_{NG}) + (1 - \gamma^{NG}) \rho_{NG} \gamma^{G} \rho_G \quad < \quad \gamma^{NG} \rho_G (1 - \gamma^{G}) \rho_{NG} + (1 - \gamma^{NG})(1 - \rho_{NG}) \gamma^{G}(1 - \rho_G)
\]

\[
0 < [(1 - \gamma^{NG}) \gamma^{G} - \gamma^{NG}(1 - \gamma^{G})][(1 - \rho_{NG})(1 - \rho_G) - \rho_{NG} \rho_G].
\]

The first term in brackets is strictly greater than zero because \( \gamma^{G} > \gamma^{NG} \) and the second term in brackets is strictly greater than zero because \( \rho_{NG} < 1/2 \) and \( \rho_G < 1/2 \).

To show \( \mu_p(C) < \phi_p = F(\alpha) \) note that in case (i), \( \overline{\alpha} < \alpha \) so the second term in the denominator of

\[
\mu_p(C) = \frac{[F(\alpha) - F(\overline{\alpha})] Pr(s = G) Pr(T = C|s = G)}{[1 - F(\overline{\alpha})] Pr(s = G) Pr(T = C|s = G) + [1 - F(\overline{\alpha})] Pr(s = NG) Pr(T = C|s = NG)} \tag{14}
\]
is strictly greater than zero, and it’s sufficient to show that:

\[
\frac{F(\alpha) - F(\alpha^1)}{1 - F(\alpha^1)} \Pr(s = G) \Pr(T = C|s = G) \leq F(\alpha)
\]

\[
F(\alpha) - F(\alpha^1) \leq F(\alpha) - F(\alpha) F(\alpha^1)
\]

\[
F(\alpha) F(\alpha^1) \leq F(\alpha^1).
\]

(15)

Now we turn to beliefs about the probability that the investigator is aggressive in case (i). Here

\[
\mu_a(C) = \frac{[1-F(\pi)]Pr(s=G)Pr(T=C|s=G) + Pr(s=NG)Pr(T=C|s=NG)]}{[1-F(\pi^1)]Pr(s=G)Pr(T=C|s=G) + Pr(s=NG)Pr(T=C|s=NG)]
\]

and

\[
\mu_a(A) = \frac{[1-F(\pi)]Pr(s=G)Pr(T=A|s=G) + Pr(s=NG)Pr(T=A|s=NG)]}{[1-F(\pi^1)]Pr(s=G)Pr(T=A|s=G) + Pr(s=NG)Pr(T=A|s=NG)]}
\]

Straightforward though tedious algebra shows that \(\mu_a(C) \leq \mu_a(A)\).

For \(\phi_a < \mu_a(C)\), we add \([F(\pi^1) - F(\alpha^1)]\Pr(s = NG)\Pr(T = C|s = NG)\) to the denominator of the above expression for \(\mu_a(C)\), cancel terms and note that \(\mu_a(C) > \)

\[
\frac{[1-F(\pi)]Pr(s=G)Pr(T=C|s=G) + Pr(s=NG)Pr(T=C|s=NG)]}{[1-F(\pi^1)]Pr(s=G)Pr(T=C|s=G) + Pr(s=NG)Pr(T=C|s=NG)]}
\]

\[
= \frac{1-F(\pi)}{1-F(\pi^1)} \geq 1 - F(\pi).
\]

For case (ii), because \(\alpha^1 > \alpha\) no passive type ever tries so \(\mu_p(C) = \mu_p(A) = 0\) and thus \(\mu_p(D) > \phi_p > \mu_p(C) = \mu_p(A)\).

In case (ii), \(\mu_a(A) = \frac{[1-F(\pi^1)]Pr(s=NG)Pr(T=A|s=NG) + [1-F(\pi)]Pr(s=G)Pr(T=A|s=G)}{[1-F(\pi^1)]Pr(s=NG)Pr(T=A|s=NG) + [1-F(\pi)]Pr(s=G)Pr(T=A|s=G) + [1-F(\pi^1)]Pr(s=G)Pr(T=C|s=NG) + [F(\pi^1) - F(\alpha^1)]Pr(s=G)Pr(T=C|s=NG)}\)

and

\[
\mu_a(C) = \frac{[1-F(\pi^1)]Pr(s=NG)Pr(T=C|s=NG) + [1-F(\pi)]Pr(s=G)Pr(T=C|s=G)}{[1-F(\pi^1)]Pr(s=NG)Pr(T=C|s=NG) + [1-F(\pi)]Pr(s=G)Pr(T=C|s=G) + [1-F(\pi^1)]Pr(s=G)Pr(T=C|s=NG) + [F(\pi^1) - F(\alpha^1)]Pr(s=G)Pr(T=C|s=NG)}\]

To show that \(\mu_a(C) \leq \mu_a(A)\), we multiply out and cancel several terms to get \(Pr(T = A|s = G) \left[ 1 - F(\pi^1) \right] \)

\[
Pr(s = NG)Pr(T = C|s = NG) + Pr(T = A|s = G) \left[ 1 - F(\pi) \right] Pr(s = G)Pr(T = C|s = G)
\]

\[
\leq Pr(T = C|s = G) \left[ 1 - F(\pi^1) \right] Pr(s = NG)Pr(T = A|s = NG) + Pr(T = C|s = G) \left[ 1 - F(\pi) \right] Pr(s = G)Pr(T = A|s = G)
\]

\[
Pr(T = A|s = G), which reduces to Pr(T = A|s = G) Pr(T = C|s = NG) \leq Pr(T = C|s = G)
\]

\[
Pr(T = A|s = NG), a condition that we already checked above as Equation 13.
\]

For \(\phi_a < \mu_a(C)\) we need

\[
1 - F(\pi) < \frac{[1-F(\pi^1)]Pr(s=NG)Pr(T=C|s=NG) + [1-F(\pi)]Pr(s=G)Pr(T=C|s=G)}{[1-F(\pi^1)]Pr(s=NG)Pr(T=C|s=NG) + [1-F(\pi)]Pr(s=G)Pr(T=C|s=G) + [1-F(\pi^1)]Pr(s=G)Pr(T=C|s=NG) + [F(\pi^1) - F(\alpha^1)]Pr(s=G)Pr(T=C|s=NG)}.
\]

Adding
\[ F(\alpha^1) \Pr(s = G) \Pr(T = C|s = G) \] to the denominator decreases the right hand side, so it is sufficient to show that

\[
1 - F(\pi) \leq \frac{[1 - F(\pi^1)] \Pr(s = NG) \Pr(T = C|s = NG) + [1 - F(\pi)] \Pr(s = G) \Pr(T = C|s = G)}{[1 - F(\pi)] [1 - F(\pi^1)]} \leq [1 - F(\pi^1)].
\]

This inequality holds because \( F(\pi) \in (0, 1) \) and \( F(\pi^1) \in [0, 1] \).

For case (iii), the argument for \( \mu_p(D) > \phi_p > \mu_p(C) \geq \mu_p(A) \) is almost identical to case (i). The only difference is that we need to allow for the possibility that \( \pi^1 = 1 \), in which case the second term in the denominator of Equation 14 is zero. So we need the inequality in Equation 15 to hold strictly, but this is guaranteed because when \( \pi^1 = 1 \) Lemma 3(v) tells us that \( \alpha^1 > 0 \) and hence \( F(\pi^1) > 0 \).

The argument for \( \mu_a(D) < \phi_a < \mu_a(C) \leq \mu_a(A) \) is almost identical to case (ii). The only difference is that we need to allow for the possibility that \( \alpha^1 = 0 \), in which case \( F(\alpha^1) \Pr(s = G) \Pr(T = C|s = G) = 0 \). So we need Equation 16 to hold strictly, but this is guaranteed because when \( \alpha^1 = 0 \) Lemma 3(v) tells us that \( \pi^1 < 1 \) and thus \( F(\pi^1) \in (0, 1) \).

For case (iv), the argument for \( \mu_p(D) > \phi_p > \mu_p(C) \geq \mu_p(A) \) is identical to case (ii). The argument for \( \mu_a(D) < \phi_a < \mu_a(C) \leq \mu_a(A) \) is identical to case (i).

**Proof of Lemma 6** We first establish existence of the cutpoints. We do this for \( \alpha^D \). The arguments for \( \alpha^C \) and \( \alpha^A \) are essentially similar. For \( \alpha^D \), note that the difference in the executive’s expected utility difference from retaining versus removing the investigator is a linear, and hence monotonic, function of \( \alpha_E \).

Specifically, the utility difference is

\[
-\mu_p(D)\alpha_E\pi - \mu_a(D) [\alpha_E\pi(q_{RG} + (1 - q)) + (1 - \alpha_E)(1 - \pi)(1 - q)\rho_{NG}]
\]
\[
-\mu_a(D) [\alpha_E\pi\rho_{RG} + (1 - \alpha_E)(1 - \pi)\rho_{NG}]
\]
\[
- \{ -\phi_p\alpha_E\pi - \phi_a [\alpha_E\pi(q_{RG} + (1 - q)) + (1 - \alpha_E)(1 - \pi)(1 - q)\rho_{NG}] - \phi_a [\alpha_E\pi\rho_{RG} + (1 - \alpha_E)(1 - \pi)\rho_{NG}] \},
\]

11
which equals
\[
\alpha_E \pi \left\{ \left[ \phi_p - \mu_p(D) \right] + \left[ \phi_n - \mu_n(D) \right] \left( q \rho_G + (1 - q) \right) + \left[ \phi_a - \mu_a(D) \right] \rho_G \right\} \\
+(1 - \alpha_E)(1 - \pi) \left\{ \left[ \phi_n - \mu_n(D) \right] (1 - q) \rho_{NG} + \left[ \phi_a - \mu_a(D) \right] \rho_{NG} \right\}
\] (17)

Also, as established in the proof of Propositions 4 and 5 an executive with \( \alpha_E = \bar{\alpha} \) strictly prefers to retain the investigator when she drops the first period case and an executive with \( \alpha_E = \bar{\pi} \) strictly prefers to remove her. Thus because Equation 17 is linear in \( \alpha_E \) there exists a cutpoint \( \alpha^D \in (\bar{\alpha}, \bar{\pi}) \) such that an executive with \( \alpha_E < \alpha^D \) prefers to retain whereas an executive with \( \alpha_E > \alpha^D \) prefers to remove the investigator.

To show that \( \alpha^D \) is a continuous function of \( \bar{\alpha}^1 \) and \( \bar{\pi}^1 \), we first note that voter beliefs \( \mu_p(D), \mu_n(D) \), and \( \mu_a(D) \) are functions of \( \bar{\alpha}^1 \) and \( \bar{\pi}^1 \):
\[
\mu_p(D) = \frac{\min \left\{ F(\bar{\alpha}^1), \frac{F(\bar{\alpha}^1)}{F(\bar{\pi}^1)} + \frac{F(\bar{\pi})}{F(\bar{\alpha}^1)} + \frac{\min \left\{ F(\bar{\alpha}), F(\bar{\alpha}) \right\}}{F(\bar{\pi})} \right\}}{F(\bar{\alpha}) + \min \left\{ F(\bar{\alpha}), F(\bar{\alpha}) \right\}},
\]
\[
\mu_a(D) = \frac{\Pr(s = NG) \left( F(\bar{\pi}^1) - \min \left\{ F(\bar{\alpha}^1), F(\bar{\pi}) \right\} \right)}{F(\bar{\alpha}) + \min \left\{ F(\bar{\alpha}), F(\bar{\alpha}) \right\}},
\]
and
\[
\mu_n(D) = 1 - \mu_p(D) - \mu_a(D).
\]

Next, we explicitly solve for \( \alpha^D \) by setting Equation 17 equal to zero, yielding:
\[
\alpha^D = \frac{(1 - \pi) \left\{ \frac{\left[ \phi_n - \mu_n(D) \right] (1 - q) \rho_{NG} + \left[ \phi_a - \mu_a(D) \right] \rho_{NG}}{\rho_G} \right\} - \pi \left\{ \frac{\left[ \phi_p - \mu_p(D) \right] + \left[ \phi_n - \mu_n(D) \right] (1 - q) \rho_{NG} + \left[ \phi_a - \mu_a(D) \right]}{\rho_G} \right\}}{(1 - \pi) \left\{ \frac{\left[ \phi_n - \mu_n(D) \right] (1 - q) \rho_{NG} + \left[ \phi_a - \mu_a(D) \right] \rho_{NG}}{\rho_G} \right\}}.
\]
Note that \( \alpha^D \) is a continuous function of \( \mu_p(D), \mu_n(D), \) and \( \mu_a(D) \) so it is a continuous function of \( \bar{\alpha}^1 \) and \( \bar{\pi}^1 \).

We now order the cutpoints relative to each other. First we note that it’s impossible to have both \( \alpha^C < \alpha^D \) and \( \alpha^A < \alpha^D \). If this were the case then any executive type with \( \alpha_E \in \left( \max \left\{ \alpha^C, \alpha^A \right\}, \alpha^D \right) \) would strictly prefer to retain the incumbent investigator after all possible first period outcomes. This is a contradiction because the replacement is drawn from the same pool as the incumbent. A similar contradiction results if \( \alpha^C > \alpha^D \) and \( \alpha^A > \alpha^D \).

The final part of the argument is to show that \( \alpha^C \leq \alpha^A \), which enables us to conclude that \( \alpha^C \leq \alpha^D \leq \alpha^A \). To prove that \( \alpha^C \leq \alpha^A \), we show that if an executive’s expected utility from retaining the investigator
After an acquittal is greater than his utility from retaining after a conviction then his utility from retaining
after a conviction is greater than his utility from a new randomly drawn investigator. We denote these utilities
as $U(\text{old}|C)$, $U(\text{old}|A)$, and $U(\text{randm})$. We also will use $U(\alpha > x)$ to denote an executive’s expected utility
from a investigator randomly drawn from the portion of the investigator type distribution $F$ that is greater
than $x$. Similarly $U(\alpha \in (x, y))$ denotes expected utility from a investigator drawn from the distribution $F$
restricted to the interval $(x, y)$.

First note that if $\alpha^1 > \alpha$ then, as shown in the proof of Lemmas 4 and 5, $\mu_a(C) \leq \mu_a(A)$ and because
passive investigators never choose $x = T$ when $\alpha^1 > \alpha$, $\mu_p(C) = \mu_p(A) = 0$, so for a neutral executive we
always have $U(\text{old}|C) \geq U(\text{old}|A)$.

The argument is more complicated when $\alpha^1 \leq \alpha$. We proceed in four steps.

**Step 1.** We first show that $\Pr(\alpha > \alpha^1|A) > \Pr(\alpha > \alpha^1|C) > 1 - F(\alpha^1)$. For $\Pr(\alpha > \alpha^1|A) >$
\[
\frac{[1-F(\alpha^1)]\Pr(s=G)\Pr(T=A|s=G)+\Pr(s=NG)\Pr(T=A|s=NG)}{[1-F(\alpha^1)]\Pr(s=G)\Pr(T=A|s=G)+\Pr(s=NG)\Pr(T=A|s=NG)+[F(\alpha^1)-F(\alpha)]\Pr(s=G)\Pr(T=A|s=NG)}
\]
must be strictly greater than
\[
\frac{[1-F(\alpha^1)]\Pr(s=G)\Pr(T=C|s=G)+\Pr(s=NG)\Pr(T=C|s=NG)}{[1-F(\alpha^1)]\Pr(s=G)\Pr(T=C|s=G)+\Pr(s=NG)\Pr(T=C|s=NG)+[F(\alpha^1)-F(\alpha)]\Pr(s=G)\Pr(T=C|s=NG)}.
\]
After multiplying out
and cancelling, this reduces to $\Pr(T = C|s = G) \Pr(T = A|s = NG) > \Pr(T = A|s = G) \Pr(T = C|s = NG)$, which we already checked as Equation 13.

For $\Pr(\alpha > \alpha^1|C) > 1 - F(\alpha^1)$, we need
\[
\frac{[1-F(\alpha^1)]\Pr(s=G)\Pr(T=C|s=G)+\Pr(s=NG)\Pr(T=C|s=NG)}{[1-F(\alpha^1)]\Pr(s=G)\Pr(T=C|s=G)+\Pr(s=NG)\Pr(T=C|s=NG)+[F(\alpha^1)-F(\alpha)]\Pr(s=G)\Pr(T=C|s=NG)} > 1 - F(\alpha^1).
\]
Multiplying out and canceling, this reduces to
\[
F(\alpha^1) \Pr(s = G) \Pr(T = C|s = G) + \Pr(s = NG) \Pr(T = C|s = NG) > \Pr(s = G) \Pr(T = C|s = G), \text{ i.e.,}
\]
\[
F(\alpha^1) \Pr(s = NG) \Pr(T = C|s = NG) > -F(\alpha^1) \Pr(s = G) \Pr(T = C|s = G).
\]
Step 2. We show that if $U \left( old \mid A \right) > U \left( old \mid C \right)$ then $U \left( \alpha > \overline{\alpha} \right) > U \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha}^1 \right) \right)$.

\[
U \left( old \mid A \right) > U \left( old \mid C \right)
\]

\[
Pr \left( \alpha > \overline{\alpha} \mid A \right) U \left( \alpha > \overline{\alpha} \right) + Pr \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \mid A \right) U \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \right) > Pr \left( \alpha > \overline{\alpha} \mid C \right) U \left( \alpha > \overline{\alpha} \right) + Pr \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \mid C \right) U \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \right)
\]

Because $Pr \left( \alpha < \underline{\alpha} \mid A \right) = Pr \left( \alpha < \underline{\alpha} \mid C \right) = 0$, we substitute $1 - Pr \left( \alpha > \overline{\alpha} \mid A \right)$ for $Pr \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \mid A \right)$ and $1 - Pr \left( \alpha > \overline{\alpha} \mid C \right)$ for $Pr \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \mid C \right)$, to get

\[
Pr \left( \alpha > \overline{\alpha} \mid A \right) \left[ U \left( \alpha > \overline{\alpha} \right) - U \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \right) \right] + U \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \right) > Pr \left( \alpha > \overline{\alpha} \mid C \right) \left[ U \left( \alpha > \overline{\alpha} \right) - U \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \right) \right] + U \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \right)
\]

\[
\left[ Pr \left( \alpha > \overline{\alpha} \mid A \right) - Pr \left( \alpha > \overline{\alpha} \mid C \right) \right] \cdot \left[ U \left( \alpha > \overline{\alpha} \right) - U \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \right) \right] > 0.
\]

From Step 1 we know that the first term in brackets is strictly greater than zero, so $U \left( \alpha > \overline{\alpha} \right) > U \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \right)$.

Step 3. We show that $U \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \right) > U \left( \alpha < \underline{\alpha} \right)$. There are two cases: $\overline{\alpha}^1 < \overline{\alpha}$ and $\overline{\alpha}^1 > \overline{\alpha}$.

For the first case, if $\alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right)$ then the investigator is either a neutral type or a passive type, and if $\alpha < \underline{\alpha}$ the investigator is a passive type with probability 1, because $\underline{\alpha} \leq \overline{\alpha}$. A neutral executive strictly prefers neutral over passive investigators so $U \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \right) > U \left( \alpha < \underline{\alpha} \right)$.

For the second case, $\overline{\alpha}^1 > \overline{\alpha}$ implies that if $\alpha > \overline{\alpha}^1$ then the investigator is surely aggressive. From Step 2 we know that $U \left( \alpha > \overline{\alpha}^1 \right) > U \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \right)$. Note that the region $\left( \underline{\alpha}^1, \overline{\alpha} \right)$ includes some investigators who are passive, some who are neutral, and some who are aggressive. Also, a neutral executive most prefers a neutral investigator so the only way that $U \left( \alpha > \overline{\alpha}^1 \right) > U \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \right)$ is if a passive investigator is the executive’s least preferred type. Because $\alpha < \underline{\alpha}^1$ implies that the investigator is passive for sure, $U \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \right) > U \left( \alpha < \underline{\alpha} \right)$.

Step 4. We show that $U \left( old \mid C \right) > U \left( rndm \right)$, i.e.,

\[
Pr \left( \alpha > \overline{\alpha} \mid C \right) U \left( \alpha > \overline{\alpha} \right) + Pr \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \mid C \right) U \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \right) > [1 - F \left( \overline{\alpha} \right)] U \left( \alpha > \overline{\alpha} \right) + [F \left( \overline{\alpha} \right) - F \left( \underline{\alpha} \right)] U \left( \alpha \in \left( \underline{\alpha}^1, \overline{\alpha} \right) \right) + F \left( \underline{\alpha} \right) U \left( \alpha < \underline{\alpha} \right).
\]
From Step 3, \( U(\alpha \in (\underline{\alpha}, \overline{\alpha})) > U(\alpha < \underline{\alpha}) \) so the inequality will hold if \( \Pr(\alpha > \overline{\alpha}|C) U(\alpha > \overline{\alpha}) + \Pr(\alpha \in (\underline{\alpha}, \overline{\alpha})|C) U(\alpha \in (\underline{\alpha}, \overline{\alpha})) > [1 - F(\overline{\alpha})] U(\alpha > \overline{\alpha}) + F(\overline{\alpha}) U(\alpha \in (\underline{\alpha}, \overline{\alpha})) \). Note that \( \Pr(\alpha > \overline{\alpha}|C) + \Pr(\alpha \in (\underline{\alpha}, \overline{\alpha})|C) = 1 \) because no investigator with \( \alpha_I < \underline{\alpha} \) will bring a case to trial. Substituting in and collecting terms, we need

\[
[\Pr(\alpha > \overline{\alpha}|C) - (1 - F(\overline{\alpha}))] [U(\alpha > \overline{\alpha}) - U(\alpha \in (\underline{\alpha}, \overline{\alpha}))] > 0.
\]

Step 1 and Step 2 establish that each term is strictly greater than zero. □

**Proof of Lemma 7** Lemmas 4 and 5 characterize equilibrium behavior for passive and aggressive executives. Here we handle the case of neutral executives.

For the type of equilibrium in Lemma 7(i), set \( \sigma_D = 1, \sigma_C = \sigma_A = 0 \) and from Lemma 6 find the cutpoint \( \alpha^C \) that arises from the resulting first investigator behavior. The executive behavior in part (i) is optimal for any \( \alpha_E \leq \alpha^C \).

For the type of equilibrium in Lemma 7(ii), set \( \sigma_D = 1, \sigma_A = 0 \), and for each value \( \sigma_C \in (0,1) \) apply Lemma 6 to find the cutpoint \( \alpha^C \) implied by the resulting first investigator behavior. For \( \alpha_E = \alpha^C \) it is optimal to play \( \sigma_D = 1 \) and \( \sigma_A = 0 \) and because this executive type is indifferent after observing a conviction in the first period, he can mix using the particular \( \sigma_C \in (0,1) \) that was used to generate \( \alpha^C \).

The construction of equilibria for parts (iii)-(vii) of the lemma are similar.

Note that no other type of equilibrium can exist for any \( \alpha_E \in [\underline{\alpha}, \overline{\alpha}] \). Consider any (possibly mixed strategy) executive strategy \( \sigma \). Given \( \sigma \), Lemma 3 implies that there exist cutpoints \( \underline{\alpha} \) and \( \overline{\alpha} \) for first period investigator behavior. Given these cutpoints, Lemma 6 characterizes cutpoints for executive behavior. It is straightforward to check that the only executive strategies \( \sigma \) that are compatible with these cutpoints are the 7 types listed in Lemma 7.

Finally, we establish existence. To do this, we construct a function \( \lambda(z) : [0, 7] \to [\underline{\alpha}, \overline{\alpha}] \). Each possible executive strategy \( \sigma \), whether a pure strategy or a mixed strategy, in parts (i)-(vii) of Lemma 7 is specified.
by some value of $z$, and we use the intermediate value theorem to show that for any $\alpha_E \in [\alpha, \bar{\alpha}]$ there is some $z$ such that $\lambda(z) = \alpha_E$, and thus there is an equilibrium with one of these 7 types of executive behavior.

For any executive strategy $\sigma = (\sigma_D, \sigma_C, \sigma_A)$, let $\alpha^1(\sigma) = (\alpha^1_0(\sigma), \bar{\alpha}^1(\sigma))$ represent the cutpoints for optimal first period investigator behavior from Lemma 3, given that the executive’s strategy is $\sigma$. Given any cutpoints for first period investigator behavior, $\alpha^1$ and $\bar{\alpha}^1$, let $\alpha^{\text{CDA}}(\alpha^1, \bar{\alpha}^1) = (\alpha_C(\alpha^1, \bar{\alpha}^1), \alpha^D(\alpha^1, \bar{\alpha}^1), \alpha^A(\alpha^1, \bar{\alpha}^1))$ be the cutpoints for executive behavior from Lemma 6. Let $\alpha_{(1)} = \alpha^C(\alpha^1(1, 0), \bar{\alpha}^1(1, 0))$, $\alpha_{(2)} = \alpha^C(\alpha^1(1, 1, 0), \bar{\alpha}^1(1, 1, 0))$, $\alpha_{(3)} = \alpha^D(\alpha^1(1, 1, 0), \bar{\alpha}^1(1, 1, 0))$, $\alpha_{(4)} = \alpha^D(\alpha^1(0, 1, 0), \bar{\alpha}^1(0, 1, 0))$, $\alpha_{(5)} = \alpha^A(\alpha^1(0, 1, 0), \bar{\alpha}^1(0, 1, 0))$, $\alpha_{(6)} = \alpha^A(\alpha^1(0, 1, 1), \bar{\alpha}^1(0, 1, 1))$. Define

$$
\lambda(z) = \begin{cases} 
\alpha + z (\alpha_{(1)} - \bar{\alpha}) & \text{for } z \in [0, 1] \\
\alpha \in [\alpha, \bar{\alpha}] : \sigma_D = 1, \sigma_C = z - 1, \sigma_A = 0 \text{ is an equilibrium} & \text{for } z \in [1, 2] \\
\alpha_{(2)} + (z - 2)(\alpha_{(3)} - \alpha_{(2)}) & \text{for } z \in [2, 3] \\
\alpha \in [\alpha, \bar{\alpha}] : \sigma_D = 1 - (z - 3), \sigma_C = 1, \sigma_A = 0 \text{ is an equilibrium} & \text{for } z \in [3, 4] \\
\alpha_{(4)} + (z - 4)(\alpha_{(5)} - \alpha_{(4)}) & \text{for } z \in [4, 5] \\
\alpha \in [\alpha, \bar{\alpha}] : \sigma_D = 0, \sigma_C = 1, \sigma_A = z - 5 \text{ is an equilibrium} & \text{for } z \in [5, 6] \\
\alpha_{(6)} + (z - 6)(\bar{\alpha} - \alpha_{(6)}) & \text{for } z \in [6, 7] 
\end{cases}
$$

And let

$$
\hat{\sigma}(z) = \begin{cases} 
(1, 0, 0) & \text{for } z \in [0, 1] \\
(1, z - 1, 0) & \text{for } z \in [1, 2] \\
(1, 1, 0) & \text{for } z \in [2, 3] \\
(1 - (z - 3), 1, 0) & \text{for } z \in [3, 4] \\
(0, 1, 0) & \text{for } z \in [4, 5] \\
(0, 1, z - 5) & \text{for } z \in [5, 6] \\
(0, 1, 1) & \text{for } z \in [6, 7] 
\end{cases}
$$

Note that $\hat{\sigma}(z)$ is a continuous function of $z$. Thus, by part (iv) of Lemma 3, the investigator cutpoints given by $\alpha^1(\hat{\sigma}(z))$ are continuous in $z$, which in turn implies, by part 2 of Lemma 6, that cutpoints for executive behavior $\alpha^{\text{CDA}}(\alpha^1(\hat{\sigma}(z)))$ are a continuous function of $z$. In particular, we care that $\alpha^C(\alpha^1(\hat{\sigma}(z)))$ is
a continuous function of \( z \) for \( z \in [1, 2] \), \( \alpha^D (\alpha^1 (\tilde{\sigma} (z))) \) is a continuous function of \( z \) for \( z \in [3, 4] \), and \( \alpha^A (\alpha^1 (\tilde{\sigma} (z))) \) is a continuous function of \( z \) for \( z \in [5, 6] \).

Thus by construction, \( \lambda (z) : [0, 7] \rightarrow [\underline{\alpha}, \overline{\alpha}] \) is a continuous function where \( \lambda (0) = \underline{\alpha} \) and \( \lambda (7) = \overline{\alpha} \) so the intermediate value theorem implies that for each \( \alpha_E \in [\underline{\alpha}, \overline{\alpha}] \) there exists at least one \( z \in [0, 7] \) such that \( \alpha_E = \lambda (z) \). By construction of \( \lambda (z) \) this implies that there exists an equilibrium. If \( z \in [0, 1] \cup [2, 3] \cup [4, 5] \cup [6, 7] \) this equilibrium is a pure strategy equilibrium from part (i), (iii), (v), or (vii) of Lemma 7 and if \( z \in [1, 2] \cup [3, 4] \cup [5, 6] \) it is a mixed strategy equilibrium from part (ii), (iv), or (vi) of Lemma 7.

**Proof of Lemma 8**  The proof of this lemma is straightforward. Here we state the argument for part (i), when the executive is either passive or passive-neutral. The arguments for other types of executives are essentially identical.

For \( \alpha^1 > \underline{\alpha} \), note that in the equilibrium that we characterize for passive and passive-neutral executives, \( r (G) < 0 \), i.e., when \( s = G \), the investigator is strictly more likely to be retained if she drops than is she tries. In terms of second period policy, any investigator is better off, in expectation, when retained, because there is a strictly positive probability that her replacement will choose a different action than the one she would have chosen. In terms of first period outcomes, an investigator with \( \alpha_I \leq \underline{\alpha} \) weakly prefers to drop when \( s = G \). Thus, because \( r (G) < 0 \), when considering both first and second period outcomes any investigator with \( \alpha_I \leq \underline{\alpha} \) strictly prefers to drop, and hence \( \alpha^1 > \underline{\alpha} \).

For \( \tilde{\alpha}^1 > \tilde{\alpha} \), note that in terms of first period outcomes any investigator with \( \alpha_I \leq \tilde{\alpha} \) weakly prefers to drop when \( s = NG \). Thus, because \( r (NG) < 0 \), when both first and second period outcomes are taken into account any investigator with \( \alpha_I \leq \tilde{\alpha} \) must strictly prefer to drop when \( s = NG \), so \( \tilde{\alpha}^1 > \tilde{\alpha} \).

**Proof of Lemma 9**  First we solve for \( \alpha^{ER} \), the cutpoint between executives who prefer passive versus random replacement investigators. Let \( U (\text{pass}) \) denote utility from a passive replacement and \( U (\text{rndm}) \) denote utility from a random replacement, where \( U (\text{pass}) = -\alpha_E \pi \) and
\[U_{(\text{rndm})} = -\phi p\alpha E \pi - \phi n [\alpha E \pi (q\rho G + (1 - q)) + (1 - \alpha E)(1 - \pi)\rho_{NG}] - \phi a [\alpha E \pi \rho G + (1 - \alpha E)(1 - \pi)\rho_{NG}] .\]

Combining terms, we get

\[U_{(\text{pass})} - U_{(\text{rndm})} = (1 - \pi)\rho_{NG} [\phi n (1 - q) + \phi a] - \alpha E \pi [1 - \phi p - \phi n (q\rho G + (1 - q)) - \phi a \rho G] - \alpha E (1 - \pi)\rho_{NG} [\phi n (1 - q) + \phi a].\]

Note that this is strictly decreasing in \(\alpha E\) so

\[\alpha^{ER} = \frac{(1 - \pi)\rho_{NG} [\phi n (1 - q) + \phi a]}{(1 - \pi)\rho_{NG} [\phi n (1 - q) + \phi a] + \pi [1 - \phi p - \phi n (q\rho G + (1 - q)) - \phi a \rho G]}.\]

To see that \(\alpha^{ER} > \alpha\), note that a passive investigator will act optimally from the perspective of an executive with \(\alpha E = \alpha\), so an executive at \(\alpha\) strictly prefers a passive investigator over a random replacement.

We now prove that \(\alpha^{ER} < \alpha E\). An executive at \(\alpha E\) is indifferent between a random draw and an investigator who dropped when behaving according to first period cutpoints \(\alpha^1 = \alpha\) and \(\pi^1 \in (\pi, 1)\), i.e., he’s at \(\alpha E = \alpha^D\) from Lemma 6 given these cutpoints. The executive at \(\alpha^{ER}\) is indifferent between a random draw and a passive investigator, which also means that he’s indifferent between a random draw and an investigator who dropped when playing according to first period cutpoints \(\alpha^1 = \alpha\) and \(\pi^1 = 1\). Because aggressive investigators are the worst type from this executive’s perspective, he must strictly prefer to retain an investigator, rather than replace her with a random replacement, if she drops when behaving according to first period cutpoints \(\alpha^1 = \alpha\) and \(\pi^1 \in (\pi, 1)\). Thus by Lemma 6, \(\alpha^{ER}\) is strictly less than the \(\alpha^D\) generated by these cutpoints for investigator behavior.

To solve for \(\alpha^{ER}\), we take a similar approach, setting the utility from an aggressive replacement, i.e.,

\[U_{(agg)} = -\alpha E \pi \rho G - (1 - \alpha E)(1 - \pi)\rho_{NG},\] equal to \(U_{(\text{rndm})}\). Solving out, we get

\[\alpha^{ER} = \frac{(1 - \pi)\rho_{NG} [1 - \phi n (1 - q) - \phi a]}{(1 - \pi)\rho_{NG} [1 - \phi n (1 - q) - \phi a] + \pi [1 - \phi p - \phi n (q\rho G + (1 - q)) - \phi a \rho G]}.\]

Arguments similar to the ones for \(\alpha^{ER}\) establish that \(\alpha E < \alpha^{ER} < \alpha\).

**Proof of Lemma 10**  First, we prove part 1 of the lemma, for \(\alpha E \in (\alpha, \alpha^{ER})\). Suppose the executive plays
\(\sigma_D \in (0, 1)\), and \(\sigma_C = \sigma_A = 0\), which means that \(r(G) = r(NG) < 0\). We need to show that it is optimal for the investigator to behave according to cutpoints \(a^1 = a\) when \(s = G\) and \(\alpha^1 \in (\alpha, 1)\) when \(s = NG\).

If \(s = G\) then any investigator with \(\alpha_I < \alpha\) strictly prefers to drop. In terms of first-period policy, she is better off dropping than trying. And accountability incentives have no effect on a passive investigator because the replacement chosen by the executive will be passive.

If \(s = G\), then a neutral investigator with \(\alpha_I \in (\alpha, \bar{\alpha})\) strictly prefers to try. In terms of first-period policy she is better off trying. In the second period, the signal will be either \(s = G\) or \(s = NG\). If the investigator tries and loses office by doing so and the second period signal is \(s = G\) then she is no worse off as a result of having tried. On the other hand if the second period signal is \(s = NG\), the dogmatic passive replacement will do exactly what the neutral investigator would do in the second period, so she winds up being strictly better off as a result of trying in the first period.

If \(s = G\), then an investigator with \(\alpha_I \geq \bar{\alpha}\) strictly prefers to try. In terms of first-period policy she is better off trying. And because \(\alpha_I \geq \bar{\alpha} > \bar{\alpha}\), for an investigator at \(\alpha_I\), \(U(\text{Try}|s = G) - U(\text{Drop}|s = G) > U(\text{Try}|s = NG) - U(\text{Drop}|s = NG)\). The worst-case scenario if the investigator tries is that by trying in the first period she loses office and the second period signal is \(s = G\) but her dogmatic passive replacement drops the case. However, it’s also possible that \(s = NG\) in the second period, in which case she would have been strictly better off trying in the first period.

We now turn to the case of \(s = NG\). If \(s = NG\) then an investigator with \(\alpha_I < \bar{\alpha}\) strictly prefers to drop. Doing so makes her strictly better off in terms of first period utility and at least weakly better off in terms of second-period utility.

For an investigator with \(\alpha_I \geq \bar{\alpha}\) the investigator’s utility difference from trying versus dropping is \(\hat{U}_{TD}(\alpha_I; NG, r(NG))\), where we put a hat over the \(U\) because with a passive replacement the utility difference is not the same as it was for a random replacement in the proof of Lemma 3. The first period utility difference is the same, based on Equation 3. In the second period, the passive replacement will always drop, whereas the incumbent investigator with \(\alpha_I \geq \bar{\alpha}\) will always try if retained. Thus, being replaced avoids some mistaken
convictions but also results in some failures to convict, i.e., for \( \alpha_I \geq \bar{\alpha} \)

\[
\hat{U}_{TD}(\alpha_I; NG, r(NG)) = \alpha_I \gamma^{NG}(1 - \rho_G) - (1 - \alpha_I)(1 - \gamma^{NG})\rho_{NG} - r(NG)(1 - \alpha_I)(1 - \pi)\rho_{NG} + r(NG)\alpha_I\pi(1 - \rho_G) = -\rho_{NG} \left[ (1 - \gamma^{NG}) + r(NG)(1 - \pi) \right] + \alpha_I(1 - \rho_G) \left[ \gamma^{NG} + r(NG)\pi \right] + \alpha_I\rho_{NG} \left[ (1 - \gamma^{NG}) + r(NG)(1 - \pi) \right].
\] (18)

Note that Equation 18 is linear in \( \alpha_I \). Also for \( r(NG) < 0 \), an investigator at \( \bar{\alpha} \) strictly prefers to drop when \( s = G \), i.e., \( \hat{U}_{TD}(\alpha_I; NG, r(NG)) < 0 \), because she is indifferent in terms of first period actions and strictly prefers to be retained rather than to have a dogmatic passive investigator choose second period actions.

There are two possibilities. First, it may be the case that \( \hat{U}_{TD}(1; NG, r(NG)) \leq 0 \), so \( \bar{\alpha}^1 = 1 \) and all investigator types strictly prefer to drop when \( s = NG \). Second, it may be the case that for some \( \bar{\alpha}^1 \in (\bar{\alpha}, 1) \), \( \hat{U}_{TD}(\bar{\alpha}^1; NG, r(NG)) = 0 \), in which case all investigator types with \( \alpha_I < \bar{\alpha}^1 \) strictly prefer to drop and those with \( \alpha_I > \bar{\alpha}^1 \) strictly prefer to try when \( s = NG \). Solving out for this case, we get

\[
\bar{\alpha}^1 = \frac{\rho_{NG} \left[ (1 - \gamma^{NG}) + r(NG)(1 - \pi) \right]}{(1 - \rho_G) \left[ \gamma^{NG} + r(NG)\pi \right] + \rho_{NG} \left[ (1 - \gamma^{NG}) + r(NG)(1 - \pi) \right]}.
\]

Note that as \( r(NG) \to 0 \), \( \bar{\alpha}^1 \to \bar{\alpha} \) (using the expression for \( \bar{\alpha} \) in the proof of Lemma 1), and \( \bar{\alpha}^1 \) is a continuous function of \( r(NG) \), and hence of \( \sigma \). Also, from Equation 18 we can solve for the largest value of \( r(NG) \) such that an investigator with \( \alpha_I = 1 \) will drop in the first period

\[
\hat{U}_{TD}(1; NG, r(NG)) \leq 0
\]

\[
(1 - \rho_G) \left[ \gamma^{NG} + r(NG)\pi \right] + \rho_{NG} \left[ (1 - \gamma^{NG}) + r(NG)(1 - \pi) \right] \leq \rho_{NG} \left[ (1 - \gamma^{NG}) + r(NG)(1 - \pi) \right] = \frac{\gamma^{NG}}{\pi} = \frac{1 - q}{\pi(1 - q)/(1 - \pi)q}.
\]

Let \( \sigma_D \) be the value of \( \sigma_D \) such that \( r(NG) \) solves this expression with equality when \( \sigma_A = \sigma_C = 0 \).

Having characterized the investigator’s best response, we now solve for the executive type \( \alpha_E \in (\bar{\alpha}, \alpha^{ER}) \).
who is indifferent between retaining and replacing the investigator when \( x = D \), given cutpoints \( \alpha^1 = \alpha \) and \( \tilde{\alpha}^1 \in [\tilde{\alpha}, 1] \) for first period executive behavior.

For \( \tilde{\alpha}^1 = \tilde{\alpha} \), any investigator who drops a case is either passive or neutral, so an executive at \( \alpha_E = \alpha \) is indifferent between retaining and replacing.

For \( \tilde{\alpha}^1 = 1 \), because \( \alpha^1 = \alpha \) any investigator who drops is either a passive type who saw \( s = G \) (with probability \( \frac{\phi_G \Pr(s = G)}{\phi_G \Pr(s = G) + \Pr(s = NG)} \)), or a random draw who saw \( s = NG \) (with probability \( \frac{\Pr(s = NG)}{\phi_G \Pr(s = G) + \Pr(s = NG)} \)).

By the definition of \( \alpha^{ER} \), an executive at \( \alpha^{ER} \) is indifferent between this lottery and a passive replacement.

For \( \tilde{\alpha}^1 \in (\tilde{\alpha}, 1) \), as in the proof of Lemma 6, the executive’s expected utility difference from retaining is

\[-\mu_p(D)\alpha_E \pi - \mu_n(D) [\alpha_E \pi (q \rho_G + (1 - q)) + (1 - \alpha_E)(1 - \pi)(1 - q) \rho_{NG}] - \mu_n(D) [\alpha_E \pi \rho_G + (1 - \alpha_E)(1 - \pi) \rho_{NG}] \]

His expected utility from a passive replacement is \( -\alpha_E \pi \). Thus his expected utility difference between retaining and removing is

\[\alpha_E \pi \left[ 1 - \mu_p(D) - \mu_n(D)(q \rho_G + (1 - q)) \right] - (1 - \alpha_E)(1 - \pi) \left[ \mu_n(D)(1 - q) \rho_{NG} + \mu_n(D) \rho_{NG} \right].\]

Note that this is strictly increasing in \( \alpha_E \). Setting it equal to zero yields the executive who is indifferent.

\[\alpha_E = \frac{(1 - \pi) \left[ \mu_n(D)(1 - q) \rho_{NG} + \mu_n(D) \rho_{NG} \right]}{(1 - \pi) \left[ \mu_n(D)(1 - q) \rho_{NG} + \mu_n(D) \rho_{NG} \right] + \pi \left[ 1 - \mu_p(D) - \mu_n(D)(q \rho_G + (1 - q)) \right]} \quad (19)\]

So we have shown that, holding \( \sigma_A = \sigma_C = 0 \), for any \( \sigma_D \in [0, \sigma_D] \) there is an executive type, which we denote as \( \alpha_E(\sigma_D) \), who is indifferent between retaining and replacing the investigator after she drops, given the cutpoints, \( \alpha^1 = \alpha \) and \( \tilde{\alpha}^1 \in [\tilde{\alpha}, 1] \), for first period investigator behavior that is a best response given \( \sigma_D \).

We have also shown that \( \alpha_E(0) = \alpha \) and \( \alpha_E(\sigma_D) = \alpha^{ER} \). Moreover, because \( \tilde{\alpha}^1 \) is a continuous function of \( \sigma_D \) and \( \alpha_E \) is a continuous function of \( \tilde{\alpha}^1 \), the composition \( \alpha_E(\sigma_D) \) is continuous as well. Thus the intermediate value theorem implies that for each \( \alpha_E \in (\alpha, \alpha^{ER}) \) there exists some \( \sigma_D \in (0, \sigma_D) \) such that there exists an equilibrium as stated in part 1 of Lemma 10.\textsuperscript{20}

\textsuperscript{20}Note that the intermediate value theorem only ensures that for some \( \sigma_D \in [0, 1] \) there exists an equilibrium. The strict set inclusion comes from the fact that \( \sigma_D = 0 \) cannot be an equilibrium for \( \alpha_E > \alpha \) and \( \sigma_D = 1 \) cannot be an equilibrium for \( \alpha_E < \alpha^{ER} \).
A similar argument proves part 2 of the lemma. The only complexity is that whereas for \( \alpha^{ER} \) we only needed to vary \( \sigma_D \) we now need to consider both \( \sigma_A \) and \( \sigma_C \). What makes this fairly straightforward is the fact that, in contrast to the case of a random replacement, it is possible for an executive with a given \( \alpha_E \) to mix both after convictions and after acquittals. The reason for this is that after either a conviction or an acquittal, because \( \bar{\alpha}^1 < \bar{\alpha} \) and \( \bar{\alpha}^1 = \bar{\alpha} \) the executive’s beliefs can be written as a convex combination of (i) a belief that the executive is aggressive and saw \( s = NG \) and (ii) a belief that the executive is randomly drawn from \( [\bar{\alpha}^1, 1] \) and saw \( s = G \). The only difference is that after convictions and acquittals the executive will put different weights on these two beliefs.

Thus, if after observing a conviction the executive is indifferent between retaining the investigator and replacing her with an investigator who is surely aggressive, he must be indifferent between an aggressive type and a random draw from \( [\bar{\alpha}^1, 1] \). But this in turn means that after an acquittal he must likewise be indifferent about whether to retain the investigator or replace her with an aggressive type. By the same argument, if the executive is indifferent after an acquittal he must be indifferent after a conviction.

Thus we can have \( \sigma_C \) and \( \sigma_A \) both strictly between zero and 1. For any \( \alpha_E \in (\bar{\alpha}^{ER}, \bar{\alpha}) \) there exists a continuum of equilibria, using different mixing probabilities \( \sigma_A \in (0, 1) \) and \( \sigma_C \in (0, 1) \), all of which lead to the same investigator behavior, as characterized by \( \alpha^1 \) and \( \bar{\alpha}^1 \). For simplicity, in the paper we state the equilibrium with \( \sigma_A = \sigma_C \).