Stovepiping*

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July 12, 2011

Abstract

In hierarchical organizations lower level agents can often censor the information that a higher level principal has available to make a decision. We present a model of this interaction in which the principal can also access an independent source of unfiltered but lower quality information besides that provided by the agent. This provision of outside information can be thought of as "stovepiping," the transmission of unfiltered information from analysts directly to decision-makers. Stovepiping can, in equilibrium, result in the agent passing along more information to the principal, precisely because the outsider's information is of lower quality than the agent's. But it can also lead the agent to "destroy" information so that there is no basis for any policy change. Accordingly, stovepiping has countervailing effects on the principal's utility. We discuss the comparative statics of equilibrium levels of information transmission with respect to the preferences of the principal, the outsider, and the probability that the outsider has access to the information held by the agent.

*We gratefully acknowledge helpful conversations with Justin Fox, Jeff Gill, Greg Huber, Kris Kanthak, Skip Lupia, Gary Miller, Burt Monroe, and Matthew Stephenson as well as the comments of audience members at the 2010 Conference on Public Policy and Political Economy at Stanford Law School and the American Politics Research Workshop at Yale University. Of course, one or both authors are responsible for all remaining errors.

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> "what the Bush people did was 'dismantle the existing filtering process that for fifty years had been preventing the policymakers from getting bad information. They created stovepipes to get the information they wanted directly to the top leadership. Their position is that the professional bureaucracy is deliberately and maliciously keeping information from them... They always had information to back up their public claims, but it was often very bad information...' "[1]

Hersh's description of the decision-making within the Bush Administration in the months leading up to the invasion of Iraq in 2003 is clearly disturbing in *ex post* terms—the certainty with which Donald Rumsfeld and his colleagues apparently believed that Saddam Hussein's regime possessed weapons of mass destruction contrasts starkly with the lack of evidence discovered after the military intervention. But this point merely highlights a potential argument in favor of political decision-makers[2] possessing control over the processes by which they are presented with decision-relevant information. In institutional terms, such control was exercised by Rumsfeld himself through his redirection of the Northern Gulf Affairs Office. Retitled the Office of Special Plans (OSP) in 2002, this office reviewed information that had been collected through both public and confidential channels, though collected little to no new intelligence on its own, as it was constitued as a policy group.[3]

The OSP was responsible for forwarding intelligence reports to the Secretary of Defense that were pertinent in its members' opinions to the planning for how best to deal with Iraq—particularly the possibility of direct military intervention. In this sense it illustrates *stovepiping*: an information transmission process in organizations in which

[1] **?**, pp. 223-224, quoting Kenneth Pollack, a former National Security Council expert on Iraq.

[2] Or, in other words, the "deciders."

[3] The office, which has since been relabeled the Northern Gulf Affairs Office, is located in the Office of the Under Secretary of Defense, Policy, in the Department of Defense.

decision makers obtain direct access to (a subset of) the same data that their bureaucratic subordinates possess, but without the data filtering and processing of data that subordinate analysts typically perform. **?** provides a direct illustration of how the OSP operated as a *stovepipe*: "...raw intelligence is usually subject to a thorough vetting process, tracked, verified, and checked by intelligence professionals. But not at OSP—the material that it produced found its way directly into speeches by Bush, Cheney, and other officials." In the case of the debate leading up to the invasion of Iraq, it was clear that a stovepipe did not lack for smoke. As an unnamed former CIA official is quoted by **?**, "[w]e collect so much stuff that you can find anything you want." After the Department of Defense's Inspector General had proffered their postmortem report about the handling of intelligence in the lead-up to the invasion of Iraq, Senator Jay Rockefeller (D, WV), the then-Chairman of the U.S. Senate Select Committee on Intelligence, described the activities of the OUSD(P) in the following very clear terms:

> "[i]ndividuals in that office produced and disseminated intelligence products outside of the regular intelligence channels. These intelligence products were inconsistent with the consensus judgments of the Intelligence Community. This office did this without coordinating with the Intelligence Community and as a result policy-makers received distorted intelligence."[4]

Of course, while captivating, the events of 2002-03 are not the first time that the importance of information in determining public policy has been observed. Indeed, it has long been acknowledged that a critical source of bureaucratic power is a monopoly over the provision of decision-relevant information to a principal (**?**, **?**). For instance, in regulatory agencies, line bureaucrats acquire information from notice and comment proceedings, investigations of complaints, petitions for action, offeror provisions, inci-

[4]Senator Jay Rockefeller, February 8, 2007 press release.

dental learning through the enforcement of existing regulations, analytical studies of regulated industries, discovery during judicial review and enforcement of agency actions, OMB reviews, GAO audits, and congressional hearings. In policymaking agencies, staff bureaucrats acquire information about policy options and their consequences from field contacts with affected parties or experts in the relevant scientific community, analysis of previously implemented policies or policies in other jurisdictions, and the received wisdom in the agency itself (even "groupthink," in pathological cases). These bits and pieces add up to a mountain of data that the agency staff filters, refines, and processes into information. This information, in turn, is transmitted to higher levels in the agency to make a decision — pursuit of an enforcement action, design of a new regulation, creation of a guidance document, or simply choice of a new policy or strategy.

Monopoly control over the gathering and processing of this data allows bureaucratic agents to exercise agenda setting power (**?**). Bureaucrats can censor some of this information in the process of transmitting to higher-ups if they consider it low quality, not worthy of action, or at odds with options they wish the agency to pursue (whether for reasons of ideology, career building, status quo bias, avoiding new work, etc.). In this way, bureaucrats can use monopoly status over information provision to define the set of options available for action by higher ups, and tilt that set in a direction they prefer.

Stovepiping is one way to challenge this control over information by analysts and line agents. The stovepipe effectively reaches from the unfiltered data directly and uninterruptedly to the final decision-maker(s). Thus stovepiping inserts an agent with authority to pass along data "around" another agent who gathers and processes it.[5] The stovepiped data, while not refined and aggregated by the line agents' expertise, is uncensored.[6] The

[5]Thus our setting is complementary to that of "whistleblowing," as formalized by **?**. Whistleblowing involves transmission of information from a line agent directly to a principal when an intermediary would prefer to censor it. Stovepiping occurs when the line agent prefers to censor information reported to the principal, but another agent transmits it directly.

[6]A similar option is for principals to consult an informal network of advisors distinct from the formally

stovepipe in our model has two defining characteristics: first, the data it provides is necessarily not processed by the line agency. An underlying assumption of our analysis below is that this reduces the quality the quality of the information, or put differently, that the line agency has useful analytic capacity.[7] Second, the stovepipe shares some interest with the principal that the line agency does not share. This shared interest arises in stovepiping because the stovepipe wants the principal to take action in cases where the line agency does not; that is the reason for (to mix metaphors a bit) the stovepipe to do an "end run" around the line agency in the first place.

From the standpoint of hierarchical control and accountability in bureaucracy, data filtering and censoring are problematic. But from the standpoint of ensuring that policy decisions are grounded in high-quality information, stovepiping is problematic as well. The literature on bureaucratic hierarchies does not offer conceptual guidance in evaluating this dilemma, so in this paper we provide a formal model to do so. The issue is obviously politically important, as the OSP vignette shows, though our purpose is not to offer an "explanation" of any actor's behavior in this case.[8]

Thus, our plan in this paper is two-fold. First, we construct a simple model of line agency information transmission to the principal. The model considers the effect of stovepiping on both the quality of decision-making (which the model makes precise) and the incentives of both the line agency and the outsider to submit information to the principal. Second, we address the effects of stovepiping on the utility of the principal. We demonstrate that these alternative information channels have two effects on the provision

designated information processing units in the agency stuff. This is a generalized version of the "kitchen cabinets" sometimes used by presidents to help them define policy options and assess their consequences.

[7]This should not be construed as an empirical argument that all line agencies do in fact have useful analytic capacity; rather, it is simply a recognition that if they do not, the principal has a different problem than the one we analyze in this paper.

[8]Among other possible reasons, we focus on the strategic and rational aspects of stovepiping, and do not wish to argue that these aspects alone determined all behavior in the case, to the exclusion of behavioral heuristics and judgment biases.

of decision-relevant information to the principal: a direct effect whereby the stovepipe reveals information the line agency does not reveal, and an indirect effect whereby the presence of a stovepipe leads the line agency to censor its reports to the principal less aggressively. At the same time, these alternative information channels are not always beneficial for the principal: stovepiping can reduce the line agency's incentives to process information in the first place, and can give line agency incentives to destroy evidence before the stovepipe (or agency) can act on it.

1 A Strategic Model of Stovepiping

In this section, we develop a strategic model of information transmission within a simple policymaking hierarchy. While this model is game-theoretic, we omit some aspects of a full description of the game for purposes of clarifying the presentation of the interesting results.

Intuitively, the model captures a process in which a line agent A is formally charged with assembling information about the value of altering policy from a status quo, and can decide at its discretion to forward its information to the principal P who will make the final decision about whether to make policy, denoted by $a_P = 1$, or not, denoted by $a_P = 0$. We assume that A is more conservative than P in the sense that there are some reports on which P would want to act but are deemed unworthy of action by A. This is not particularly restrictive given P's power to choose a_P: if A were less conservative — *i.e.* there are reports on which A would act but P would find unpersuasive as the basis of making new policy — then P could simply ignore them.

With positive probability, an *Outsider* O observes the same information observed by the agent about the value of new policy as well. If O observes this information, it can choose to forward it to P regardless of A's action. The Outsider is, for the time being, assumed to be less conservative (*i.e.*, more likely to favor making new policy, $a_p = 1$) than both P and A in the sense that if either P or A believes that a report warrants making new policy, then O necessarily finds this information persuasive as well. In addition, A has substantive capacity to implement policy that brings it systematically closer to P's desired outcome, but only if A involves itself by recommending a policy change; otherwise P must pursue policy change without A's substantive capacity. One way to think of this is that policy can result in a Type I error — taking action when it is inappropriate — and actors are ordered in terms of the cost they attach to Type I errors.[9] While A attaches the greatest cost to Type I error, all actors also know that, given that policy change will take place, the probability of Type I error is minimized when A applies its substantive capacity to implementing the new policy.

For instance, A could represent a field agent in the FBI who observes untoward activity among suspected terrorist organizations, but is concerned that intervening against the suspects prematurely could undermine a more intricate case he or she is working on. On the other hand, P is less concerned about line agents' painstaking case development, and more concerned to "do something" in the public eye about terrorism and ensure that no attacks happen on her watch — besides, if new action is taken inappropriately, P can always blame it on overzealous field agents. The outside informant O in this example could represent agents from another unit (*e.g.* another division of the FBI, the CIA, or local law enforcement) who believe the agents A are excessively lax or timid. Numerous other examples are also possible, *e.g.* with A representing the National Security Agency, P the president, and O a military commander in the field.

Alternatively, A could represent drug reviewers at the Food and Drug Administration who observe the quality of scientific protocols used to evaluate the efficacy and safety of new drugs proposed by industry, while P represents a hierarchical principal in the FDA

[9]Type II errors are also possible, as we detail below when specifying utility functions.

with formal authority to approve new drugs for marketing. Due to their acute concern for the scientific reputation of their agency (**?**), drug reviewers may be inclined against approving new drugs for marketing if they are supported by lax protocols. On the other hand, P may be more attuned to political pressure to break the "drug lag" and bring new drugs to market. The outsider O could then represent other informed groups such as pharmaceutical research associations, patient advocacy groups, or government health researchers (*e.g.* the National Cancer Institute) who are more interested than FDA drug reviewers in seeing new drugs approved for marketing. While these outside groups have information about drug safety and efficacy to present to the principal, P still benefits from A's involvement; *e.g.* A may have specific expertise in crafting a drug label to convey intricate dosage information and side effects to physicians.

Structure of Play. The line agent A observes the report r with probability $c_A \in (0,1]$ and the Outsider O observes the report r with probability $c_O \in (0,1]$. Whether A or O observes the report is independent of whether the other player observes the report, and neither player observes whether the other player observes the report. The probabilities c_A and c_O are common knowledge. Upon observing r, player $i \in \{A, O\}$ chooses whether to forward the report to the Principal: $a_i = 1$ if the report is forwarded by i and $a_i = 0$ otherwise. After A and O have made their decisions the Principal decides whether to promulgate a new policy ($a_P = 1$) or not ($a_P = 0$).

When $c_A < 1$, standard bureaucratic redundancy arguments[10] imply that the Outsider's presence is beneficial for the principal, P. Specifically, the Outsider's presence raises the probability that at least one agent observes the report. As will become clear below, however, this is not the primary value of O to P; rather O is valuable because of the changes it induces in A's reporting behavior. Note that we formally model A and

[10]See, for example, **?**, **?**, and **?**.

O's decisions to submit the report to P as simultaneous.

It may seem that stovepiping would be more naturally captured in a sequential game in which O observes A's report a_A, and then chooses its report a_O. However, it can be shown that the sequential move version when O follows A will generate the same subgame perfect Nash equilibria. In particular, O's would report exactly the same set of reports in both versions of the game and, more importantly, O's decision is independent of A's action (and, hence, strategy) in *both* game forms.[11]

Information. The report r consists of one number, $q_r > 1$, which represents the quality of policy implementation based upon the report.[12] Report quality q_r is observed by the Principal if and only if the report is forwarded by either the Agency or the Outsider, and the the Agency and/or Outsider can forward the report only if they observe it. Information is "hard" in the sense that if either A or O forwards the report, they must do so truthfully; they cannot lie about its content. This is a straightforward way to represent either relational/reputational costs, or formal legal sanctions (as might apply to A), associated with lying about q_r; essentially we are assuming that these costs are high enough to deter lying even if it is caught with very small probability. While A and O must tell the truth, they need not tell the "whole truth": they may send no signal at all. This captures a situation in which information submitted to the agency comes with a paper trail; agents have some discretion to decide what information (if any) to pass up the hierarchy, but passing up false information is formally prohibited.

Note that our model is not a "cheap-talk" signaling model, in that the report r

[11]To push this a bit farther (and allude to two assumptions of the model that are formally presented below), the crucial assumptions here are that O's reporting decision is pivotal (in the sense of affecting any player's payoff) only when A does not report *and* that O observes the quality level, q_r, with certainty regardless of A's action.

[12]The minimal quality being equal to 1 – in addition to simplifying the algebra underneath the model – allows one to think of the quality of the report as the ratio of the information contained in the report to the information possessed by the Principal prior to reading the report.

can be revealed credibly. A better description of the model is as one of "informational gatekeeping" with multiple gatekeepers. The state of nature is r revealed with some positive probability to the agents who then independently decide whether to also reveal it to the principal. The agents have divergent preferences, in this case over the minimal quality of information required for the agent in question to prefer that the Principal make new policy, and divergent abilities. As we discuss below, the conservative informational gatekeeper (in this case the Agency) is also more effective at utilizing the information contained in any given report. Accordingly, one can conceive of the Agency as inherently possessing "more information" than the Outsider.

The "Policy-setting" Process. If $a_P = 0$, an exogenous status quo with known utilities remains in effect. If $a_P = 1$, P makes new policy with *precision* (or *quality*) equal to q_r. "Precision" is assumed here to be a commonly valued characteristic of policymaking: high precision is preferred, *ceteris paribus*, by all three agents.[13] The precision of the report r is drawn from a commonly known distribution with cumulative distribution function F. We assume that the observation of the report by the Agent and the Outsider (occurring with probabilities of c_A and c_O, respectively) are each independent of q_r.[14]

[13]We use the term "precision" in both its formal and intuitive senses (for they coincide here): the precision of a random variable is simply the reciprocal of its variance. Thus, the precision of policymaking is inversely proportional to the uncertainty about the policy's consequences. This uncertainty can be thought of as representing the quality of the report to the degree that higher quality reports provide more information that can be used to foresee and insure against potential consequences of changing public policy.

[14]This assumption is important in that it greatly simplifies the Agent's calculation of the probability that the Outsider also possesses a report that the Agent has observed (and conversely for the Outsider when considering whether the Agent has observed a report that the Outsider possesses).

Payoffs. The Principal's payoff function, u_P, is based on a_O, a_P, and q_r as follows:

$$u_P(a_O, a_P, q_r) = \begin{cases} b_P - \frac{1}{q_r} & \text{if } a_P = 1 \text{ and } a_A = 1, \\ b_P - \frac{\tau}{q_r} & \text{if } a_P = 1,\ a_O = 1, \text{ and } a_A = 0 \\ -x_P & \text{if } a_P = 0. \end{cases}$$

Thus the first line covers cases where P makes new policy with A's input, the second line where P makes new policy with O's input but not A's, and the third where P keeps the status quo. The parameter $b_P \geq 0$ measures the Principal's desire to promulgate new policies, *ceteris paribus.* For instance, the principal may desire to "leave her mark" on policy or show some degree of activity to yet a higher level (unmodeled) principal. The parameter $x_P \in (0, 1)$ represents the Principal's payoff loss from the status quo policy. In our framework, the cost of promulgating a new policy ($a_P = 1$) stems from uncertainty about policy outcomes (which is inversely proportional to q_r). This could be described as the potential for blame for policy outcomes that would be (perhaps unfairly) attributed to the new regulation. Alternatively it could simply be standard spatial distance between a desired target outcome and the realized outcome.[15] The parameter $\tau > 1$ is an exogenous and commonly known value that measures the increased uncertainty (*i.e.* lack of precision) resulting from policymaking *without* the guidance of the Agency. We assume that q_r and the observations of the report by the Agency and Outsider are all independently distributed. [16]

[15]For our purposes, this approach to the Principal's payoff function is intended to capture the possibility that the Principal would rather "do nothing" without sufficient information. We could capture this just as easily by assuming that there is a direct cost of making a new policy.

[16]In addition to being a key technical assumption, it is also a substantive one, for it distinctly limits the degree to which one can think of r as being generated through the Agency's information collection efforts about an underlying "state of nature." In such a model, for example, low values of q_r might imply to the Outsider that the Agency did not observe the report.

The Outsider's payoff function, u_O, is similarly based on a_O, a_P, and q_r:

$$u_O(a_O, a_P, q_r) = \begin{cases} \sigma b_P - \frac{1}{q_r} & \text{if } a_P = 1 \text{ and } a_A = 1, \\ \sigma b_P - \frac{\tau}{q_r} & \text{if } a_P = 1,\ a_O = 1, \text{ and } a_A = 0 \\ -x_O & \text{if } a_P = 0. \end{cases}$$

The parameter σ measures the alignment between the Outsider's and Principal's direct preferences for "new policymaking" and $x_O \in (0,1)$ represents the Outsider's payoff loss from the status quo policy. The Outsider and the Principal effectively have identical preferences over policy outcomes and, if $\sigma \geq 1$, the Outsider's preference for new policymaking are at least as strong as the Principal's. Conversely, when $\sigma \in (0,1)$, the Outsider has a *ceteris paribus* preference for new policymaking, but this preference is weaker than the Principal's.

Finally, the Agency's payoff function, u_A, is based on a_O, a_P, and q_r as follows:

$$u_A(a_P, q_r) = \begin{cases} -\frac{1}{q_r} & \text{if } a_P = 1 \text{ and } a_A = 1, \\ -\frac{\tau}{q_r} & \text{if } a_P = 1,\ a_O = 1, \text{ and } a_A = 0 \\ -x_A & \text{if } a_P = 0. \end{cases}$$

where $x_A \in (0,1)$ represents the Agency's payoff loss from the status quo policy.

Several features of the payoffs are worth mentioning due to the role they play in our results. First, all players share preferences over implementation quality: higher values of q_r uniformly make the players better off conditional on the Principal making policy ($a_P = 1$). This holds regardless of whether the Agency, Outsider, or both forward the report to the Principal. Second, note that the model appears to represent divergence in the players' preferences in two ways: they may have different preferences over whether to make new policy at all (*i.e.*, $\sigma b_P > 0$) and/or they may receive different relative payoffs from the status quo (for example, $b_P = 0$ but $x_A \neq 0$). This difference is one in appearance only, as the action space is particularly coarse. In instrumental terms, policy is either changed or it is not. Accordingly, there is a duality built into the model's parameterization: increasing x_P is equivalent to increasing b_P.[17] However, the representation allows us to frame the comparative statics in direct terms so that the presentation of the results is clearer.

Third, no player cares about the quality of the report, q_r, unless the Principal chooses to make new policy ($a_P = 1$). This assumption creates an incentive for all players to defer to the status quo policy unless the report has high enough quality. Thus, though the players agree that precision in policy implementation (*i.e.*, a high quality report) is desirable, there is important heterogeneity in their motivations through the fact that they will disagree over the cost of Type I errors or, in other words, what level of quality is sufficiently high to justify changing the status quo policy.

Fourth and finally, we assume throughout that for each player $i \in \{A, O, P\}$, there is a sufficiently high level of quality such that player i would be made strictly better off by new policy being made (*i.e.*, such that $a_P = 1$ is strictly preferred by player i to $a_P = 0$). Thus, Type II errors (failing to change policy when it is beneficial relative to the status quo) are a potential concern to all players, as are Type I errors (changing policy when it is not beneficial). Furthermore, we assume that there are sufficiently low quality reports that the Agency would prefer not to make new policy.

[17]Indeed, if $x_P + b_P > 1$, then $a_P = 1$ is a strictly dominant strategy for the Principal.

2 Analysis

With the payoff functions in hand, it is simple to define the following sequentially rational policymaking strategy for the Principal. Along with the content of the report r, q_r, there are essentially three cases to consider (one of which is invariant to the content of the report because the Principal does not observe it). These are described below.

- *Policymaking with "Everyone in the Room."* Given a report r with quality q forwarded by the Agency ($a_A = 1$), the Principal's optimal policy choice is

$$a_P^*(q|a_A = 1, a_O = 0) = a_P^*(q|a_A = 1, a_O = 1) = \begin{cases} 1 & \text{if } b_P + x_P \geq 1/q, \\ 0 & \text{otherwise.} \end{cases}$$

- *Policymaking with the Agency Absent.* Given a report r with quality q not forwarded by the Agency ($a_A = 0$) but forwarded by the Outsider ($a_O = 1$), the Principal's optimal policy choice is

$$a_P^*(q|a_A = 0, a_O = 1) = \begin{cases} 1 & \text{if } b_P + x_P \geq \tau/q, \\ 0 & \text{otherwise.} \end{cases}$$

- *Policymaking with no report.* Given a report r with quality q not forwarded by either the Agency or by the Outsider ($a_A = a_O = 0$), the Principal's optimal policy choice is

$$a_P^*(q|a_A = 0, a_O = 0) = \begin{cases} 1 & \text{if } b_P + x_P > 1 \\ 0 & \text{otherwise.} \end{cases}$$

Before continuing, it is useful to note the nature of the Principal's possible responses to a report: he either "pulls the trigger" and makes new policy or he effectively ignores the report. This stark approach is useful because it allows us to focus on the interesting aspects of the informational structure.[18] Specifically, the analysis here is of information handling within the bureaucracy.

The Responsive Principal Assumption. The following assumption is a useful baseline to rule out uninteresting cases.

Assumption 1 *The Principal prefers leaving policy unchanged in the absence of a report:* $b_P + x_P \leq 1$*.*

Without this assumption, there is never a reason (presuming sequential rationality by the Principal) for either the Agent or the Outsider to withhold a report. Even more specifically, when this assumption is violated the only reason for P to listen to a stovepipe is essentially to insure against the possibility that the Agency does not receive a report (which occurs with probability $1 - c_A$). In such cases, the stovepipe benefits both the Principal *and the Agency* in a standard redundancy fashion. While this is of course an empirically relevant consideration in real-world organizations, note that its effects are not the result of any interesting strategic interaction between any of the players.[19]

Note that the Outsider's expected payoff is independent of his or her choice to report (a_O) if the Agency reports. Thus, the Outsider's expected payoff from $a_O = 1$, conditional on $a_A = 0$, q_r, and the Principal's optimal strategy as described above, is[20]

$$V_O(a_O = 1; q) = \begin{cases} \sigma b_P - \tau/q & \text{if } b_P + x_P \geq \tau/q, \\ -x_O & \text{otherwise.} \end{cases} \quad (1)$$

[18] As opposed, for example, to the microfoundations of information collection, as studied in **?**.

[19] Specifically, if Assumption 1 is violated, then each player's optimal choice is dictated by weak dominance, which is essentially a decision-theoretic concept.

[20] Note that it is not necessary to consider O's inferences about q_r conditional on $a_A = 0$. If O observes r then there is no additional information conveyed to O due to $a_A = 0$. If O does not observe r, then $a_A = 0$ does convey information, but it is irrelevant because O does not itself have a report to provide P.

It is without loss of generality to presume that the Outsider reports only if the Principal would act upon the report (this is always known by the Outsider conditional on observing r, since τ, b_P, and x_P are all common knowledge and the Outsider knows q_r). This strategy is written formally as

$$a_O^*(q) = \begin{cases} 1 & \text{if } \min[b_P + x_P, \sigma b_P + x_O] \geq \tau/q \\ 0 & \text{otherwise.} \end{cases} \tag{2}$$

In equilibrium, then, the Agency's strategic incentives are derived using (2), which leads to the following expected payoff function for the Agency:[21]

$$v_A(a_A|q, c_O) = \begin{cases} -1/q & \text{if } b_P + x_P \geq 1/q \text{ and } a_A = 1 \\ -\frac{c_O \tau}{q} - (1 - c_O)x_A & \text{if } \min[b_P + x_P, \sigma b_P + x_O] \geq \tau/q \text{ and } a_A = 0 \\ -x_A & \text{otherwise.} \end{cases} \tag{3}$$

Utilizing Equation 3, the following straightforward derivations yield the optimal strategy for the Agency.

If $\min[b_P + x_P, \sigma b_P + x_O] \geq \tau/q$, then the Agency should report whenever

$$-1/q \geq -\frac{c_O \tau}{q} - (1 - c_O)x_A,$$
$$q \geq \frac{1 - c_O \tau}{(1 - c_O)x_A},$$

[21]These expected payoffs are calculated conditional upon the Agency observing r: thus, c_A plays no role. Clearly, an *ex ante* expected payoff calculation would incorporate this probability. But the observation of r by the Agency is by assumption outside of the Agency's control and is independent of all other aspects of the game.

and if $b_P + x_P \geq 1/q$, the Agency should report whenever $q \geq 1/x_A$. Indeed, $a_A = 1$ is a dominant action for any report with $q \geq 1/x_A$.[22] Accordingly, the Agency's optimal strategy can be written as follows.

$$a_A^* = \begin{cases} 1 & \text{if } q \geq 1/x_A, \\ 1 & \text{if } q \geq \max\left[\tau/\min[b_P + x_P, \sigma b_P + x_O], \frac{1-c_O\tau}{(1-c_O)x_A}\right], \\ 0 & \text{otherwise.} \end{cases} \tag{4}$$

We are now in a position to examine the comparative statics of the Agency's optimal behavior. There are two cases of interest, depending on whether the Outsider is more or less conservative than the Principal. If $b_P + x_P < \sigma b_P + x_O$, then the Principal is more conservative than the Outsider and, conversely, if $b_P + x_P > \sigma b_P + x_O$, then the Outsider is more conservative than the Principal. We label these two cases "Aggressive Outsider" and "Conservative Outsider," respectively.

To make the presentation of the remaining results parsimonious, we assume throughout what follows that q_r is drawn from a continuously differentiable cumulative distribution function (CDF) $F(q)$ (with probability density function f) possessing positive support for all $q > 1$.

Assumption 2 (Higher Quality Reports Always Possible) *For all $q > 1$, $f(q) > 0$.*

With Assumption 2 in hand, we can now proceed to answer several questions within the model. First, under what circumstances does the presence of the Outsider affect the Agency's behavior? Second, what are the determinants of the proportion of reports that are forwarded by the Agency in response to the presence of the Outsider?

[22] If $b_P + x_P < 1/q$, the Principal will not act upon the report. Since forwarding the report is costless, it is weakly dominant for the agency to forward the report in such cases.

When Does Stovepiping Alter the Agency's Behavior? Equation 4 clearly indicates a necessary condition for the Outsider's presence to have any effect on the number of reports forwarded by the Agency. Specifically, since $1/x_A > \frac{1-c_O\tau}{(1-c_O)x_A}$ for all $\tau > 1$, $c_0 > 0$, and $x_A >$, the following must hold for the Agency to forward reports in the presence of the Outsider that would not be forwarded if the Outsider were not present:

$$1/x_A > \tau/\min[b_P + x_P, \sigma b_P + x_O]. \quad (5)$$

The following proposition summarizes the implications of Inequality 5.[23]

Proposition 1 *The Outsider has an effect on the optimal reporting behavior of the Agency if*

1. *the Agency is sufficiently satisfied with the status quo policy (x_A is close enough to zero),*
2. *the Principal is sufficiently interested in making new policy (b_P is large enough), or*
3. *O and P are both sufficiently displeased by the status quo (x_P and x_O are large enough).*

The first conclusion of Proposition 1 is intuitive: when the agency is sufficiently satisfied with the status quo policy, the presence of a stovepipe will lead to an increase in the number of reports that are forwarded to the Principal simply because the choice of not forwarding the report to the Principal is no longer sufficient to guarantee that the status quo policy will remain in effect. So long as the Outsider is less efficient at policy implementation than the Agency (*i.e.*, $\tau > 1$), the installation of a stovepipe will lead

[23]While the proof of this Proposition is omitted – it follows from inspection of Equation 5 – it is important to recall that it utilizes our assumption that $\tau > 1$.

to direct reduction in the Agency's expected payoff from withholding reports from the Principal.

The second and third conclusions of Proposition 1 are similar to the first conclusion but rely on a slightly different foundation. Specifically, as the Principal and the Outsider both become increasingly displeased with the status quo and/or the Principal is sufficiently interested in making new policy for the sake of making new policy, the Agency realizes that the minimal quality level that the Principal and Outsider will find sufficient cause to make new policy is decreasing as well. Since the Agency has an incentive to be "in the room" whenever it knows that a new policy is being made, the increasing willingness of the Principal to make policy increases the willingness of the Agency to forward reports to the Principal.

Proposition 1 compares the frequency of reporting under two starkly different institutional structures (*i.e.*, in the presence of vs. the absence of any Outsider). We now turn to the question of comparing institutional structures that, in general, differ on the margin: holding the presence of the stovepipe constant, we can examine the effect of changes in the preference and technology parameters of the model.

Comparative Statics of the Agency's Behavior. In order for the comparative statics of the Agency's behavior to depend on the structure of the Outsider's involvement, the Outsider need be sufficiently competent (*i.e.*, that τ not be too large). Otherwise, the minimum level of quality that the Agency need worry about depends solely on the Principal's preferences.[24] The maximum level of relative inefficiency of implementation

[24] Specifically, even though the Agency may will rationally forward some reports that would not be forwarded in the absence of the Outsider, the minimal level of quality that the Agency would prefer to forward if the Principal were going to act upon that quality is lower than the minimal level of quality that the Principal would act upon in the Agency's absence. Accordingly, sequential rationality implies that the Agency's behavior in such realms is sensitive to the Principal's preferences.

in the absence of the Agency is given by the following inequality:

$$\begin{aligned} 0 &< \frac{1 - c_O \tau}{(1 - c_O) x_A} - \tau/(b_P + x_P), \\ \tau &< \frac{b_P + x_P}{c_O(b_P + x_P) + (1 - c_O) x_A}. \end{aligned} \tag{6}$$

Aggressive Outsider. Supposing that $b_P + x_P < \sigma b_P + x_O$ and that Inequality 6 is satisfied, the reports of interest are those for which

$$q \in \left(\frac{1 - c_O \tau}{(1 - c_O) x_A}, \frac{1}{x_A} \right). \tag{7}$$

This is the set of reports that, in equilibrium, the Outsider's presence causes the Agency to forward to the Principal when the Outsider is sufficiently competent that Inequality 6 is satisfied. This set is nonempty for all $c_O > 0$ and vanishes when $c_O = 0$. Invoking Assumption 2 then yields the following comparative static.

Proposition 2 *When the Outsider is more aggressive than the Principal and the Outsider is not too incompetent (*i.e., *Inequality 6 is satisfied), the* ex ante *probability that the Agency forwards a report to the Principal is*

1. increasing *with respect to the probability that the Outsider observes the report, c_O, and*

2. increasing *with respect to the Outsider's relative incompetence, τ.*

Supposing that $b_P + x_P < \sigma b_P + x_O$ and that Inequality 6 is *not* satisfied, the reports of interest are those for which

$$q \in \left(\frac{\tau}{b_P + x_P}, \frac{1}{x_A} \right). \tag{8}$$

As above, this is the set of reports that, in equilibrium, the Outsider's presence causes the Agency to forward to the Principal when the Outsider is sufficiently incompetent that Inequality 6 is not satisfied. This set is clearly empty for sufficiently large values of τ: in such cases the Outsider's presence has no effect on the Agency's reporting behavior. Invoking Assumption 2 then yields the following comparative static.

Proposition 3 *When the Outsider is more aggressive than the Principal and the Outsider is sufficiently incompetent (*i.e.*, Inequality 6 is not satisfied), the* ex ante *probability that the Agency forwards a report to the Principal is* decreasing *with respect to the Outsider's relative incompetence, τ.*

The effect of the Outsider's relative inefficiency (τ) is displayed in Figure **??**. The figures graphs the minimal quality level that the Agency would forward to the Principal as a function of τ. All three possible regions are illustrated. When τ is low (*i.e.*, close to 1), the effect of increasing τ is to decrease the minimal quality level (increasing the frequency of reports being forwarded), as described in Proposition 2. For intermediate values of τ, increasing τ increases the minimal quality level that is forwarded (decreasing the frequency of reports being forwarded), as described in Proposition 3. Finally, for sufficiently large values of τ, the Agency's behavior is insensitive to further increases in τ because the Principal will never act upon a report unless it is forwarded by the Agency.

Before continuing to the case of a conservative Outsider, note that – regardless of the competence of the Outsider (*i.e.*, the value of τ) – the set of reports that the Agency will forward to the Principal is – quite intuitively – increasing in the Agency's dissatisfaction with the status quo (*i.e.*, x_A).

Conservative Outsider. When $b_P + x_P > \sigma b_P + x_O$, the analogue to Inequality 6 is

$$\tau < \frac{\sigma b_P + x_O}{c_O(\sigma b_P + x_O) + (1 - c_O)x_A}. \tag{9}$$

Also, when $b_P + x_P > \sigma b_P + x_O$, Inequality 9 also identifies when the agency's behavior is affected directly by the preferences of the Outsider. Thus, the following Propositions are immediate.

Proposition 4 *When the Outsider is more conservative than the Principal and the Outsider is not too incompetent (*i.e., *Inequality 9 is satisfied), the* ex ante *probability that the Agency forwards a report to the Principal is*

1. increasing *with respect to the probability that the Outsider observes the report, c_O, and*

2. increasing *with respect to the Outsider's relative incompetence, τ.*

Proposition 5 *When the Outsider is more conservative than the Principal and the Outsider is sufficiently incompetent (*i.e., *Inequality 9 is not satisfied), the* ex ante *probability that the Agency forwards a report to the Principal is*

1. decreasing *with respect to the Outsider's relative incompetence, τ.*

2. increasing *with respect to the similarity of the Principal and Outsider's preferences, σ.*

3 Stovepipes and Endogenous Information Collection

The fundamental strategic effect of stovepiping and kitchen cabinets is to increase the Agent's incentive to report what it knows. It may therefore seem that P is uniformly better off with a stovepipe than without. However, this intuition ignores the effects of stovepiping on the Agent's incentives to acquire information in the first place. In this subsection we consider two extensions that partially endogenize the information conditions in the game. Both of these extensions show that the simple intuition that stovepipes are beneficial for the principal is misguided when information is endogenous.

Throughout this section we make the simplifying normalization that $x_P = x_O = 0$: the Principal and Outsider's interests in making new policy are measured completely by b_P.[25]

3.1 Costly Information Processing in the Agency

The first extension relates to information acquisition by the Agent when the Outsider's information is given. Just as the stovepipe can induce the Agency to forward reports that it would not otherwise forward, the stovepipe can induce the Agency to acquire more information in the first place. At the same time, if the stovepipe does not impose too large a cost on the Agency when it does not report, the stovepipe can actually reduce the Agency's incentive to acquire information about q.

Specifically, we suppose now that the Agency can choose whether to discover the report r's quality, q_r. As above, the Agency believes that the distribution of the quality is characterized by a cumulative distribution function, F. If the Agency chooses to

[25]This is without loss of generality because b_P can be interpreted as already capturing the opportunity cost of maintaining the status quo for both P and O.

discover the quality q_r, then it incurs an opportunity cost denoted by $k > 0$. The Agency can then decide whether to forward the report to the Principal as in the analysis reported in the previous section. If the Agency choose not to discover the quality, then it can not forward the report to the Principal.[26] Regardless of the Agency's decision, the Outsider learns q with probability c_O, as in the earlier analysis. This assumption removes any strategic effects of the Agency's decision on the likelihood that the Outsider will forward the information to the Principal.

Let $q^*(\tau, b_P, \sigma, c_O, x_A)$ denote the minimal quality level of the set of reports that the Agency would forward to the Principal. Recalling Equation 4 and substituting our assumption that $x_P = x_O = 0$, this threshold is given by

$$q^*(\tau, b_P, \sigma, c_O, x_A) \equiv \max\left[\frac{\tau}{\min[b_P, \sigma b_P]}, \frac{1 - c_O\tau}{(1 - c_O)x_A}\right], \tag{10}$$

which, whenever the context is clear, we will denote simply by q^*.

Aggressive Outsider: $\sigma \geq 1$. If the Outsider is at least as aggressive as the Principal in pursuit of policy change, then the reporting threshold presented in Equation 10 can be rewritten as

$$q^* \equiv \max\left[\frac{\tau}{b_P}, \frac{1 - c_O\tau}{(1 - c_O)x_A}\right],$$

Applying sequential rationality on the part of the Agency implies that the Agency's expected payoff from discovering the report's quality is

$$\overline{v}_A^1 = -\left[\int_1^{\tau/b_P} x_A dF + \int_{\tau/b_P}^{q^*} \left(\frac{c_O\tau}{q} + (1 - c_O)x_A\right) dF + \int_{q^*}^{\infty} \frac{1}{q} dF\right] - k,$$

[26]This assumption could be relaxed in transparent ways, but creates a clear baseline for analysis: the report represents "raw information" that is unintelligible to non-experts prior to being processed in some fashion.

and the Agency's expected payoff from not discovering the report's quality is

$$\overline{v}_A^0 = -\left[\int_1^{\tau/b_P} x_A dF + \int_{\tau/b_P}^{\infty}\left(\frac{c_O\tau}{q} + (1-c_O)x_A\right)dF\right].$$

Thus, the Agency's net expected payoff from processing the report and discovering q_r can be written as

$$\Delta_A(\tau, b_P, \sigma, c_O, x_A, k) \equiv \int_{q^*}^{\infty}\left(\frac{c_O\tau - 1}{q} + (1-c_O)x_A\right)dF - k. \tag{11}$$

Conservative Outsider: $\sigma < 1$. If the Outsider is no more aggressive than the Principal in pursuit of policy change, then the reporting threshold presented in Equation 10 can be rewritten as

$$q^* \equiv \max\left[\frac{\tau}{\sigma b_P}, \frac{1-c_O\tau}{(1-c_O)x_A}\right].$$

Note, however, that duplicating the derivations for the case of an aggressive Outsider results in the following expression of the Agency's net expected payoff from processing the report and discovering q_r:

$$\Delta_A(\tau, b_P, \sigma, c_O, x_A, k) \equiv \int_{q^*}^{\infty}\left(\frac{c_O\tau - 1}{q} + (1-c_O)x_A\right)dF - k,$$

which is identical to Equation 11. All differences between the Agency's optimal behavior when the Outsider is aggressive and that when the Outsider is conservative are conveyed through the differences between q^* in the two cases (*i.e.*, the differences due to the change in which constraint binds: τ/b_P or $\tau/(\sigma b_P)$) and, accordingly, we can omit the distinction between the two cases in the analysis that follows.

To be clear, note that if Δ_A is positive, the Agency's optimal response is to incur the cost k to discover q_r while, if Δ_A is negative, the Agency's optimal choice is to decline to process the report. Note that, while the comparative statics of Δ_A depend crucially and unsurprisingly on those of q^*, there are now direct effects of c_O and x_A as well in the sense that these parameters affect the Agency's decision to acquire information even if they have no effect on the frequency with which the Agency would forward an already-processed report to the Principal. Let $k^*(\tau, b_P, \sigma, c_O, x_A)$ be defined as the opportunity cost that leaves the Agency indifferent with respect to whether it processes the report or not:

$$k^* \equiv \int_{q^*}^{\infty} \left(\frac{c_O \tau - 1}{q} + (1 - c_O) x_A \right) dF.$$

We can now directly describe the effect of various parameters on the Agency's willingness to gather and process information for potential forwarding to the Principal. That is the subject of the following proposition.

Proposition 6 *Suppose that $c_O < 1$. Then, the maximum cost the Agency should incur to discover the quality of the report, k^*, is*

1. *non-increasing in the minimal report quality the Agency would forward to the Principal (q^*),*
2. *increasing in the Agency's dissatisfaction with the status quo (x_A),*
3. *may be increasing or decreasing in the probability that the Outsider observes the report (c_O).*

Proof: The first conclusion requires a straightforward application of Leibniz's rule:

$$\begin{aligned}
\frac{\partial k^*}{\partial q^*} =& \frac{\partial}{\partial q^*} \int_{q^*}^{\infty} \left(\frac{c_O \tau - 1}{q} + (1 - c_O) x_A \right) dF, \\
=& -\left(\frac{c_O \tau - 1}{q^*} + (1 - c_O) x_A \right) f(q^*), \\
=& \begin{cases} 0 & \text{if } \frac{\tau}{\min[b_P, \sigma b_P]} < \frac{1 - c_O \tau}{(1 - c_O) x_A} \\ \left(\min[b_P, \sigma b_P] \frac{1 - c_O \tau}{\tau} - (1 - c_O) x_A \right) f(q^*) \leq 0 & \text{if } \frac{\tau}{\min[b_P, \sigma b_P]} \geq \frac{1 - c_O \tau}{(1 - c_O) x_A} \end{cases} \qquad (12)
\end{aligned}$$

where Inequality 12 is implied by the following derivation:

$$\begin{aligned}
\frac{1 - c_O \tau}{(1 - c_O) x_A} &\leq \frac{\tau}{\min[b_P, \sigma b_P]}, \\
\left(\min[b_P, \sigma b_P] \frac{1 - c_O \tau}{\tau} - (1 - c_O) x_A \right) &\leq 0, \\
\left(\min[b_P, \sigma b_P] \frac{1 - c_O \tau}{\tau} - (1 - c_O) x_A \right) f(q^*) &\leq 0.
\end{aligned}$$

The second conclusion follows from a more involved application of Leibniz's rule:

$$\begin{aligned}
\frac{\partial k^*}{\partial x_A} =& \frac{\partial}{\partial x_A} \int_{q^*}^{\infty} \left(\frac{c_O \tau - 1}{q} + (1 - c_O) x_A \right) dF, \\
=& \int_{q^*}^{\infty} \frac{\partial}{\partial x_A} \left(\frac{c_O \tau - 1}{q} + (1 - c_O) x_A \right) dF - \frac{\partial q^*}{\partial x_A} \cdot \left(\frac{c_O \tau - 1}{q^*} + (1 - c_O) x_A \right) f(q^*), \\
=& (1 - c_O)(1 - F(q^*)) > 0. \qquad (13)
\end{aligned}$$

The third conclusion follows from a similar application of Leibniz's rule: letting

$$G_F(q^*) \equiv \int_{q^*}^{\infty} q^{-1} dF,$$

partial differentiation of k^* with respect to c_O yields the following:

$$\begin{aligned}\frac{\partial k^*}{\partial c_O} =& \frac{\partial}{\partial c_O}\int_{q^*}^{\infty}\left(\frac{c_O\tau - 1}{q} + (1-c_O)x_A\right)dF,\\ =& \int_{q^*}^{\infty}\left(\frac{\tau}{q} - x_A\right)dF - \frac{\partial q^*}{\partial c_O}\cdot\left(\frac{c_O\tau - 1}{q^*} + (1-c_O)x_A\right)f(q^*),\\ =& \tau G_F(q^*) - x_A(1-F(q^*)) \end{aligned} \tag{14}$$

To establish the relevant conclusion of the proposition, note that $G_F(q^*) \in (0, 1/q^*)$ and $G'_F \leq 0$, but more importantly, note that q^* is independent of F, since q^* is based on an interim calculation after q is realized. Thus, for any $\varepsilon > 0$ and $q^* > 1$, there exists a CDF F^+ satisfying our assumptions such that $\min[F^+(q^*), G_{F^+}(q^*)] > 1 - \varepsilon$ and there exists a CDF F^- satisfying our assumptions such that $\max[F^-(q^*), G_{F^-}(q^*)] < \varepsilon$. These facts imply that, fixing $x_A \in (0,1)$ and $\tau > 1$, one can find a CDF F^+ such that the right hand side of Equation 14 is positive, and a CDF F^- such that the right hand side of Equation 14 is negative, as was to be shown. ∎

Proposition 6 can be interpreted in the following way. The first conclusion, that the Agency is *less willing* to pay for reports when *those forwarded by the Agency* have higher expected quality is interesting and somewhat counterintuitive. Accordingly, it is illustriative to understand its basis. As the proof of the proposition lays out, the Agency's willingness to pay for information is invariant to q^* when q^* is determined "by the Agency," which is the case when $\frac{\tau}{\min[b_P, \sigma b_P]} < \frac{1-c_O\tau}{(1-c_O)x_A}$. This is essentially because the change in q^* is necessarily implying a chance in one or both of c_O and x_A so that the Agency remains indifferent to changes of q^* exactly when q^* is defined by the level of quality defined by the Agency's interim indifference as to whether to forward the report to the Principal.

The second conclusion is unsurprising – as the Agency's disutility from the status uo policy increases, both the net payoff from forwarding any given report to the Principal and the probability of observing a report of sufficiently high quality to warrant forwarding increase as well. The complementary effects directly translate into an increased willingness on the Agency's part to pay to acquire information in the hopes of generating an actionable report.

Finally, the third conclusion is the closer in spirit to n existence result than a positive characterization: the effect of increased involvement by the Outsider (higher values of c_O) on the Agency's willingness to acquire information is ambiguous from an *ex ante* perspective. This ambiguity follows from the range of possible distributions of q. If few reports are of very high quality (*i.e.*, a higher proportion of the mass of F is just less than x_A^{-1}), then increasing the probability that the Outsider gets the report will increase the Agency's incentive to screen the report as well. If – on the other hand – many reports were of very high quality (*i.e.*, greater than x_A^{-1}), then the Outsider's involvement is with a very high probability a substitute for that of the Agency from the Agency's perspective. Accordingly, in such a case increasing the probability that the Outsider gets the report will decrease the Agency's incentive to invest in information acquisition.

3.2 Agency Sabotage

In the previous extension we considered an institutional environment in which the stovepipe's access to the information was beyond the Agency's control. A closely related institutional possibility would allow the Agency to preclude both itself and the Outsider from the report. For instance, the Agency might choose to "sabotage" the report by destroying the evidence before it can be processed. Specifically, we suppose now that before the game laid out in section 1 is played, the Agency has a chance to permanently destroy the report (which is equivalent to imposing $c_A = c_O = 0$ in the formulation of Section 1).

If the Agency chooses not to sabotage, then the game proceeds as in 1 whereas, if the Agency does sabotage, then *neither* the Agency nor the Outsider observes the report. We maintain our other assumptions about players' information and payoffs, so that the choice by the Agency to sabotage and destroy the report implies that the status quo policy will be retained, resulting in a payoff of $-x_A$ for the Agency.

Aggressive Outsider: $\sigma \geq 1$. If the Outsider is at least as aggressive as the Principal in pursuit of policy change, then we can utilize sequential ratonality and the arguments Section 3.1 to write the Agency's expected payoff from *not sabotaging* the report's quality as

$$\underline{v}_A^1 = -\left[\int_1^{\tau/b_P} x_A dF + \int_{\tau/b_P}^{q^*} \left(\frac{c_O \tau}{q} + (1 - c_O) x_A\right) dF + \int_{q^*}^{\infty} \frac{1}{q} dF\right],$$

and the Agency's expected payoff from sabotaging the report as

$$\underline{v}_A^0 = -x_A.$$

Continuing with the logic of Section 3.1, we can define the net payoff from sabotage as

$$\begin{aligned} \Sigma &= \underline{v}_A^0 - \underline{v}_A^1 \\ &= c_O \int_{\tau/b_P}^{q^*} \left(\frac{\tau}{q} - x_A\right) dF + \int_{q^*}^{\infty} \left(\frac{1}{q} - x_A\right) dF \end{aligned}$$

The first result is perhaps the most informative about the nature of the Agency's strategic calculation: the Agency will sabotage *only* if it is the most conservative player (*i.e.*, $q^* > \tau/b_P$). This is because, in essence, the Agency need fear the Outsider's involvement only when there are reports such that the Outsider would forward them to the Principal, the Principal would act upon them with only the Outsider in the room, and the Agency would not forward them to the Principal in the Outsider's absence.

Proposition 7 *The Agency will sabotage the information collection process only if it is more conservative than both the Principal and the Outsider. That is, sabotage is the optimal choice for the Agency only if* $q^* \geq \max[\tau/\min[b_P, \sigma b_P]]$.

Proposition 7 additionally provides a useful baseline in terms of deriving the comparative statics of the benefit from sabotage.[27] In particular, noting that

$$\frac{\partial q^*}{\partial c_O} = \begin{cases} \frac{1-\tau}{(1-c_O)^2 x_A} < 0 & \text{if } \frac{\tau}{\min[b_P,\sigma b_P]} < \frac{1-c_O\tau}{(1-c_O)x_A}, \\ 0 & \text{if } \frac{\tau}{\min[b_P,\sigma b_P]} \geq \frac{1-c_O\tau}{(1-c_O)x_A}, \end{cases}$$

direct and repeated applications of Leibniz's rule yield the following:

$$\frac{\partial \Sigma}{\partial c_O} = \begin{cases} \int_{\tau/b_P}^{q^*} \left(\frac{\tau}{q} - x_A\right) dF + \frac{1-\tau}{(1-c_O)^2 x_A} c_O f(q^*) \left(\frac{\tau-1}{q^*}\right) & \text{if } \frac{\tau}{\min[b_P,\sigma b_P]} < \frac{1-c_O\tau}{(1-c_O)x_A}, \\ \int_{\tau/b_P}^{q^*} \left(\frac{\tau}{q} - x_A\right) dF > 0 & \text{if } \frac{\tau}{\min[b_P,\sigma b_P]} \geq \frac{1-c_O\tau}{(1-c_O)x_A}, \end{cases}$$

$$\frac{\partial \Sigma}{\partial \tau} = \begin{cases} c_O \left(\int_{\tau/b_P}^{q^*} q^{-1} dF + (x_A - b_P) f(\tau/b_P)\right) & \text{if } \tau/b_P < q^*, \\ c_O (x_A - b_P) f(\tau/b_P) < 0 & \text{if } \tau/b_P \geq q^*, \end{cases}$$

$$\frac{\partial \Sigma}{\partial b_P} = \frac{c_O \tau}{b_P^2} (b_P - x_A) f(\tau/b_P) > 0,$$

$$\frac{\partial \Sigma}{\partial x_A} = -c_O (1 - F(\tau/b_P)) < 0.$$

These derivations allow us to present the following proposition without proof.

Proposition 8 *If* $q^* > \max[\tau/\min[b_P, \sigma b_P]]$*, the Agency's incentive to sabotage the information collection process*

[27] For reasons of parsimony, we omit the presentation of an explicit "microfoundation" for the verbal depictions of the behavioral implications of our comparative statics analysis. We omit this because it is straightforward and well-understood how to extend this type of model so as to have (in this case) the Agency face a randomly and exogenously determined "cost of sabotage" so as to more properly motivate the use of phrases such as "more likely to sabotage."

- *may be increasing or decreasing with respect to the probability that the Outsider will observe an unsabotaged report* (c_O)*,*

- *may be increasing or decreasing with respect to the Outsider's competence* (τ)*,*

- *is increasing with respect to the Principal's desire to promulgate a new policy* (b_P)*, and*

- *is decreasing with respect to the Agent's dissatifaction with the status quo policy* (x_A)*.*

Taken together, the results on endogenous information show that the welfare effects of stovepiping for the principal are more subtle than they first appear. The results of Section 2 demonstrate that the "first order" effects of stovepiping is to increase P's information, both directly through the stovepipe's reporting and indirectly through the altered incentives of the agent to transmit its information. But stovepiping also has "second order" effects when information in the agency is endogenous. Stovepiping can in some cases (depending on the effectiveness of the stovepipe when the agency remains ignorant) decrease the agent's incentive to incur costs to obtain information, and stovepiping can increase the agent's incentive to sabotage available information to ensure that no policy change can be made. These "second order" effects work against the "first order" effects of stovepiping by decreasing the aggregate information available in the policy making process, to the detriment of the principal.

4 Stovepiping and Organizational Design

Because stovepiping can provide the Principal with a basis for policy change even if the Agent does not report, it can also affect the optimal organizational structure from the perspective of an external designer. In particular, even if such a designer strongly disagrees with the organization's Principal about the desirability of the status quo vs. policy change, stovepiping can induce a designer to build organizations in which the organizational Agent and Principal have similar preferences about changing the status quo.

To capture this idea consider a Designer D with payoffs

$$u_D(a_P, q_r) = \begin{cases} -\frac{1}{q_r} & \text{if } a_P = 1 \text{ and } a_A = 1, \\ -\frac{\tau}{q_r} & \text{if } a_P = 1,\ a_O = 1, \text{ and } a_A = 0 \\ x_D \equiv 0 & \text{if } a_P = 0. \end{cases}$$

D always prefers the status quo to remain in place; if $a_P = 1$ then D has the same payoffs ascribed to A in section 1. As will become clear, assuming D always prefers the status quo is revealing precisely because it is so stark.

Suppose that D can choose $x_A \in [0, 1)$. If P did not have access to O's stovepiped data, D's choice of x_A would be straightforward: it would choose $x_A = 0$ and thereby ensure that A censors all reports so that the status quo always remains in effect. That is, D would deliberately undermine the provision of analysis to P by ensuring that A (like D itself) always prefers $a_P = 0$.

Against this benchmark, stovepiping dramatically changes D's optimal design. Suppose that after D chooses x_A, P, A, and O play the baseline game described in section 1. Suppose further that $x_P = x_O$ and $\sigma = 1$, so that O and P are equally conservative about policy change vs. the status quo, and that D is aware of these parameters as well as τ, the stovepipe's effectiveness. Altogether, this sequence of moves and payoffs defines the organizational design game.

The presence of O implies that D cannot ensure that the status quo remains in place with its choice of A. While D always prefers $a_P = 0$, it prefers P to act on A's advice whenever $a_P = 1$. Thus whenever τ is sufficiently small that P chooses $a_P = 1$ given $a_O = 1$ and $a_A = 0$, D prefers x_A such that A would in fact choose to forward its report to P. Whenever τ is sufficiently large that $a_P = 0$ whenever A withholds its report, D prefers $x_A = 0$ — an agent as favorable to the status quo as D itself. The critical value of τ for these cases is $(b_P + x_P)q$: P chooses $a_P = 1$ when $a_A = 0$ if and only if τ does not exceed this value.

This reasoning establishes the following proposition.

Proposition 9 *In the design game with $x_D \equiv 0$, $x_P = x_O$, $\sigma = 1$, D's optimal choice of A is*

1. $x_A^* = 0$ *if* $\tau > (b_P + x_P)q$, *and*

2. $x_A^* = x_P$ *if* $\tau \leq (b_P + x_P)q$.

While it is straightforward to extend proposition 9 to general parameter values, this case is the most interesting. Given the standing assumption that $x_P \in (0, 1)$, $x_D = 0$ ensures as much conflict between P and D as possible for these payoff functions. Yet in spite of this conflict, stovepiping gives D clear incentives to design an organization in which the expert analyst A shares P's preferences rather than D's.

In the US federal context, this result is interesting if one interprets D as Congress, which has statutory authority over executive branch organizational structure, and P an appointee of the President. Even though Congress and the President's appointees may have conflicting assessments of the value of policy change, Congress has an incentive to create executive branch structures in which the President's agents have ready access to good advice. This supports executive branch policy making that Congress would prefer not to happen, but under the threat of stovepiping the alternative is not executive branch inaction — it is poorly informed executive action.[28]

5 Conclusion

When bureaucrats have the first cut at decision-relevant information and can censor it, they exercise agenda setting power with respect to hierarchical principals. Principals, for their part, can employ several alternative channels to obtain the requisite information despite this agenda setting. Stovepipes and other outside providers of information provide such a channel. While these alternative information sources may be less "conservative" (status quo-inclined) than line bureaucrats, they typically do not have the substantive expertise or organizational resources that line bureaucrats have to formulate or implement a decision. Thus, while stovepipes may be more willing than line agents to provide information to a decision-making principal, their information may not be as high in quality as the line agents'.

The model in this paper captures this dynamic, and its effect on the information available to principals in policy making. The model reveals two effects whereby stovepipes can lead to greater provision of information to a decision maker. First, the stovepipe provides information to the principal in situations where the line agent does not, because the line agent considers the information too weak to be actionable. Second, the stovepipe induces the line agent to report information to the principal in situations where the line agent would not report if there were no stovepipe. This is precisely because the stovepipe's information is of lower quality than the line agent's, and given that policy will be changed

[28]Obviously, Congress's statutory levers do not endow it with fine-grained control over line agent preferences. As senior executive personnel change and line agencies ossify in their own routines and values, mismatches between x_P and x_A are bound to occur. Thus, proposition 9 should not be read as an (empirically invalid) assertion that Congress designs all stovepiping out of the executive branch. Rather, it encapsulates at a broad level Congress's incentives to support unilateral executive power with high quality information.

in such instances, the line agent would rather its higher quality information be used as the basis for it. The line agent would rather not change policy at all in these cases, but with a more aggressive (inclined to change the status quo) stovepipe and principal, this is not an option. Thus, the model reveals that in these senses, stovepipes and kitchen cabinets increase the information available to the principal to make a decision, and therefore the principal's utility.

At the same time, these effects assume that the information available to both the line agent and the outsider is given. When this information is endogenous, the effects of stovepipes and kitchen cabinets on the principal's utility are more subtle. First, if the stovepipe's information — though of lower quality than the line agent's — is reasonably good, the line agent may have less incentive to incur any costs to process the information the principal needs. In such cases, the stovepipe creates a redundant channel of information, and the line agent has an incentive to free ride on its provision of information to the principal. Ironically, to avoid such perverse incentives on the agent, the principal prefers a relatively incompetent stovepipe or kitchen cabinet. Second, the line agent may have an opportunity to "sabotage" the decision-relevant information, or destroy it before either the agent itself or the stovepipe can act on it. The agent has an incentive to sabotage the information when it is sufficiently conservative. In such cases the principal is better off with no stovepipe at all; in that case, the agent passes at least some information to the principal, rather than censoring it entirely.