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Article

# Discretionary Authority and Prioritizing in Government Agencies

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## Abstract

Government agencies have a certain freedom to choose among different possible courses of action. This article studies agency decision making on priorities in a principal–agent framework with multiple tasks. Agency leadership has discretion over part of the agency’s budget to incentivize staff in the pickup of cases. The head is concerned not only with society’s benefits from the agency’s overall performance, but also with the organization’s public image. Based on their talent and the contracts offered by the head, staff officials choose which type of task to pursue: complex major cases with an uncertain outcome or basic minor and simple cases with a higher probability of success. We show how the size of the agency’s discretionary budget influences both the scale and type of tasks it will engage in. Small changes in the budget can cause extensive restructuring from major to minor tasks, or vice versa, causing social welfare jumps. The mechanism provides overhead authorities with some control over the priorities of supposedly independent agencies. It applies generally to government bureaus with the formal and informal discretion to choose their tasks. Antitrust authorities serve as one illustration of implications for institutional design.

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## Introduction

Government agencies have a certain amount of autonomy and independence from political influence in the execution of their functions in the machinery of government. Examples are central banks, intelligence agencies, environmental protection, and immigration and customs enforcement, consumer product safety commissions, internal revenue services, antitrust authorities, public prosecutors, energy regulators, and gambling control boards. The laws they enforce typically leave these institutions considerable freedom, formal, and informal, to choose among different possible courses of action. Principally tasked with decision

making in specific cases, their leadership has discretion over how to prioritize potential matters to pursue, how to conduct investigations, and what remedies to impose upon finding a breach of law.<sup>1</sup> At the same time, their political overseers also have the means to control supposedly independent bureaucracies.<sup>2</sup>

In addition to their principal tasks, agencies have other, noncase-specific concerns of self-presentation through professional communication and public relations directed at forming the organization’s public image and reputation.<sup>3</sup> If a fraction of the public has little knowledge of the existence and usefulness of an agency, cases that attract media coverage increase visibility. For the better informed audience, the daring take up of larger and more complex cases can signal

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- 1 See [Gailmard \(2002, 2009\)](#), [Shotts and Wiseman \(2010\)](#), and [Enns-Jedenastik \(2015\)](#).
- 2 See [McCubbins, Noll, and Weingast \(1987, 1989\)](#) and [Miller and Whitford \(2016\)](#).
- 3 See [Carpenter \(2014\)](#).

toughness. Impression management helps secure public support for the agency's stately goals and the budget. Image is important to agencies, as their tasks, be it controlling inflation, terrorism, money laundering, cartels or gambling schemes, are often enigmatic. Securing the execution of such diverse tasks is further complicated by agency issues within agencies. The leadership has only limited ability to direct its staff with incentive contracts. In addition, civil servant incentives such as mission-motivation, empire-building, or conformity are known to induce suboptimal spending, bureaucratic slack, and promotion of third-party interest.<sup>4</sup>

In this article, we consider bureaucrat preferences in a principal-agent model with multiple tasks. We study how variations in available resources can qualitatively change the range of activities the agency will engage in and how this will affect welfare. The agency has a two-level organizational structure. The head of the agency (principal) is concerned with society's benefit from the agency's overall performance, but also with impression management. The agency's employed staff of officials (agents) can choose with some autonomy between different types of activities. The tasks vary in their expertise requirements and yield of social welfare gains upon completion, the probability of which is a function of staff effort and complexity of the tasks.

The head is sensitive to what are politically timely priorities to pursue and what are not. He may be appointed for his inclination or, for career concerns, he may bend according to political winds. Some heads may simply enjoy the instant credit for taking action, or intrinsically value the new experiences brought by novel cases, while discounting the probability of success for a big case running longer than his term in office—so that his successor will have to see it through. A different head may prefer to avoid certain matters, out of concern for budget security or maybe capture. The head also values exposure through advocacy activities, such as informal opinions, conference contributions, and appearing in the media. The budget residual that is not spent on cases is (partly) available for such noncase-specific activities.

The officials are permanently employed at a fixed wage, yet the head has discretion over part of the agency's budget to offer rewards to further incentivize his staff. These variable contracts can contain some explicit incentive pay, as is common in corporations where bonuses can be tied to revenue or profit, but typically such institutions are more subtle. Rewards can include nonmonetary incentives such as appreciation by superiors and in the public opinion, job-fulfillment, assignment to more interesting cases or discretion over one's own agenda, but harder ones, too, including the value

of future career advancement, in- and outside the agency via revolving doors, schooling opportunities or the tertiary benefits officials enjoy, such as participation in the agency's international network, research projects, or conferences abroad. Depending on the contract offered, the officials either pursue the more demanding and complex high-profile cases or opt to do simpler basic tasks. The budget residue that ends up not being awarded to the staff decreases both in the size of the rewards and in the probability of the tasks being completed successfully.

We identify how small changes in the budget can have drastic consequences for society's benefits from agency enforcement. Discretionary budget changes over certain thresholds can cause extensive restructuring, both away from and toward activities that require more expertise, and yield a major outcome. Social welfare is nonmonotonic and discontinuous in the budget. At a jump discontinuity, an infinitesimal budget cut may lead to a substantial increase in welfare, beyond direct fund savings. At other budget levels, more discretionary spending increases welfare.

These insights underline the importance of institutional design for the effective operation of government agencies. Given staff quality, the socially optimal budget crucially depends on the head's inclination. Apart from appointing a head whose make up is congruent with government priorities, budget assignments are a potential control tool in the arsenal of a government pursuing political goals or promoting third-party interests against the agency's public tasks. Another are institutional mergers as a method of reform.

The budget control mechanism that we lay out in this article applies generally to government bureaus with the formal and informal discretion to choose their tasks. After obligatory tasks such as the maintenance of the payment system, central bankers have to decide which ones to monitor and/or investigate between many new financial product developments and banking institutions. The lower the central banks budget, the less it will be inclined to probe highly complex financial engineering or fin-techs. Likewise, intelligence agencies will focus on different national security threats, depending on their resources and reputation. Public pressure, for example, over privacy concerns or the handling of asylum cases involving children, raise certain enforcement priorities higher on the agenda. The IRS, with limited means to probe tax filings, will be forced to seek priorities in manageable inspections and may avoid investigating multinationals with complex transfer pricing agreements—until there is a public outcry against tax avoidance. Public prosecutors, including the DoJ Antitrust Division that we study more deeply in Section "Concluding Remarks", must prioritize cases to pursue, depending on staff quality and incentives, as must gambling control boards in their surveillance of casinos that may be more or less embedded in the underworld.

<sup>4</sup> See Niskanen (1968, 2007), Peltzman (1976), Wilson (1991), and Gailmard (2010).

Our approach adds to the literature on contracting in government agencies by considering both the optimal and feasible agency choice of task and performance with a given budget constraint and a multilevel hierarchy. The economic literature on governmental organization has predominantly focused on the political control of agencies, as in [Macey \(1992\)](#), incentives created by sharing regulatory rights between several regulatory bodies, as in [Martimort \(1996\)](#), and regulatory competition or collusion with separation of powers, as in [Tirole \(1986\)](#) and [Laffont and Martimort \(1999\)](#).

[Niskanen \(1968\)](#) points at the incentives of bureaucrats for self-interested budget maximization and empire-building. [Stigler \(1971\)](#) and later [Laffont and Tirole \(1991\)](#) identify how agencies, created to act in the public interest, may be captured instead to advance the commercial or special concerns of interest groups that dominate the industry. [Leaver \(2009\)](#) reveals how a minimal squawk theory, in which officials try to minimize their mistakes for fear of being publicly marked as incompetent, rather than maximizing social welfare can explain institutional behavior. [Kreps \(1997\)](#), [Murdock \(2002\)](#), and [Benabou and Tirole \(2003\)](#) endogenize intrinsic motivation, particularly in public services and nonprofit organizations. [Francois \(2000, 2003\)](#) stresses the importance in these institutions of mission–motivation (a desire to promote the agency’s goals) and warm-glow utility (a desire for positive appraisal). We set up the objective of the head as a combination of personal self-interest in the opening of high-profile cases and discretionary budget spending, and the social benefits of the agency’s activities—which may itself derive from personal interests such as career.

[Dewatripont, Jewitt, and Tirole \(1999\)](#) derive implications for the optimal incentive provisions when civil servants are largely driven by career concerns and mission–motivation. [Miller \(2000\)](#) argues how a certain independence of bureaucrats from political superiors helps to prevent infection with the latter’s exposure to moral hazard. [Alesina and Tabellini \(2007 and 2008\)](#) study consequences for the type of tasks a politician should delegate to career-concerned bureaucrats, if the head has either bureaucratic or political concerns. [Makris \(2009\)](#) shows, in an analysis of the effect of budget changes by a principal on a single mission-motivated agent, that the application of standard incentive contracts to government agencies may lead to a suboptimal provision of public services. Our officials care about a monetized value of case success.

Our theory of prioritizing in government agencies also contributes to the theoretical political science literature on modeling the effects of myriad aspects of bureaucratic institutions that goes back to [Friedrich \(1941\)](#). [Miller and Whitford \(2016\)](#) is a recent comprehensive contribution. This literature is concerned with discretion in public administrations, primarily by

taking a principal–agent approach in which the principal is a political overhead authority and the agency the agent. [Gailmard \(2002\)](#) derives how preference divergence between a legislature and an expert bureaucrat can complicate control of the former over the latter and induce the legislature to acquire more own expertise. [Wiseman \(2009\)](#) models how an executive review of agency rule-making can benefit policy making authorities with diverging preferences more than legislative delegation. In [Gailmard \(2009\)](#), it is shown how a well-designed state-contingent incentive scheme can better control bureaucratic decisions in public interest than “menu law,” provided the legislature has limited control. [Gailmard and Patty \(2012\)](#) offer a review.

The mechanism that we study in this article reveals how a political overseer can use an agency’s budget as a level to influence decision making by the head, as principal, steering its civil servants as agents. [Kaufman \(1981\)](#) and [Miller \(1993\)](#) also model agency heads as principals, with an imperfect command of control tools at their disposal. [Thompson \(1993\)](#) discusses budgets and price contracts as controls of public agencies, including within, verbally. [Frant \(1996\)](#) suggests a useful methodology for analyzing high- and low-powered incentives in public sector organizations. [Shotts and Wiseman \(2010\)](#) show in a principal–agent model with a political executive and an investigator how the executive can influence the take-up of cases by the agency through the threat of replacement. We study budget and staff rewards as tools.

We consider a head with given divergent preferences. Studying appointment processes in public agencies, [Prendergast \(2007\)](#) shows how self-sorting in bureaucracies based on service motivation may lead to a substantial part of the workforce having preferences that are misaligned with the institute’s given objectives. [Lewis \(2007\)](#) finds that political appointees do worse than career managers in bureaucracies. Yet [Enns-Jedenastik \(2015\)](#) reports that in West European countries, the more independent an agency formally is, the more likely it is that an individual with ties to a government party is appointed head. While this may detract from its independence, seeking out an aligned head is one way to reduce an agency’s dependence on its head’s inclination.

The remainder of this article is organized as follows. The basic model is introduced in Section “A Model of Government Agency”. In Section “Binding Discretionary Budget and the Agency’s Task Focus”, the main results under a budget restriction are presented. Welfare implications are discussed in Section “Welfare Implications of the Agency’s Focus Shifts”. In Section “Agency with Several Officials and Multiple Tasks”, the model is extended to multiple tasks and officials. In Section “Implications for Institutional Design: An Antitrust Case Study”, several implications

for institutional design are discussed, including an optimal level of autonomy from government in spending, using competition authorities as an illustration. Section “Concluding Remarks” concludes, discussing among other aspects how our model allows for studies of the optimal use of the budget lever identified by political overhead authorities in a higher level principal–agent relationship of the kind considered more widely in the political science literature on bureaucracy control. The proofs are given in the [supplementary appendix](#).

### A Model of Government Agency

Consider a government agency that can undertake several activities. Each of these  $n$  tasks  $i \in I$ , with  $I = \{1, \dots, n\}$ , is characterized by a double  $(\psi_i, d_i)$ , where  $\psi_i \geq 0$  represents the difficulty of task  $i$  and  $d_i \geq 0$  are the social benefits that the task yields upon successful completion. Officials differ in their skills, knowledge, and talent level, captured by parameter  $\theta \in [0, 1]$ . The head’s expertise consists of full information about the official’s talent  $\theta$  and idiosyncratic sensitivity to proper case pickup.

The agency is assigned a budget, which consist of two components. A generic part of the budget pays for such costs as employing the head and the officials on fixed wage contracts for regular work, support staff, overhead for facilities, and other expenses. An additional part  $D$  of the budget is at the head’s sole discretion. He can use it for motivational rewards for his officials to take on additional tasks, or for the impression management of his agency’s public image.

The agency’s organizational structure is as follows. The agency head (principal) offers an upfront take-it-or-leave-it contract to each official, or case-handling team of officials (agent), who subsequently undertakes the actual tasks. In the following, we refer to the decision making agent as “the official.” A contract is a list of rewards for completing the tasks. After both the head and the official learn whether the task that the official has picked up has been successfully completed, the head pays the official according to the contract terms. The head has the residual budget available for noncase-specific activities.

In this section, we study how the restrictions on these incentive contracts affect the agency’s way of prioritizing activities. Throughout this section, we assume that  $D$  is sufficient to finance any contract the head might wish to offer. In Section “Binding Discretionary Budget and the Agency’s Task Focus”, we study the implications of a binding (discretionary) budget. We begin by analyzing a representative official, who decides among the performance of  $n$  tasks. We then turn to the head’s strategies.

#### Effort Chosen by the Agency’s Official

Within the context of his contract with the agency, the official uses his professional expertise on the task set to

choose which task he will try to complete in addition to his basic workload. The official cannot do more than one task at the time, and without complementarity between the tasks, the head will not induce the official to take up more than one task anyway. In taking on a task, the official exerts effort  $a \geq 0$  at a personal cost  $c(a)$ . His reward cannot be made conditional on his effort level directly, which is either unobservable or in-contractible by the head. Instead, the outcome is contracted. If task  $i$  is successfully completed, the official receives the reward  $R_i \geq 0$  specified in his contract with the agency. If no task is completed, the official’s additional pay is zero. The offered contract is thus  $R = (R_1, \dots, R_n) \in \mathbb{R}_{+,0}^n$  where  $R_i \geq 0$  for every  $i$ . The official can always decide not to exert additional effort ( $a = 0$ ) and ensure basic utility from regular work for himself. In addition to his fixed income, we normalize the official’s reservation utility level to zero.

Effort translates into probabilities that the task worked on will be completed, depending on the talent of the official and difficulty of the task. If the official decides to pursue task  $i$ , the probability of completing that task is modeled to be

$$p_i(a, \theta) = a \times \theta^{\psi_i},$$

while the probability of completing any other task is zero.<sup>5</sup>

The official is risk neutral. Knowing his own talent, when he decides to pursue task  $i$ , the official’s expected utility is

$$E[U^O(a, \theta)] = p_i(a, \theta)R_i - c(a).$$

The costs of his effort are set to  $c(a) = \frac{1}{2}\gamma a^2$ , where  $\gamma > 0$  is a scaling parameter. The effort costs are increasing and convex in  $a$ , which amounts to diminishing returns of the probability of completing a task from exerting higher effort. Note that assuming  $\gamma > D$  implies that optimal effort will remain in the interval  $(0, 1)$  and the agency never has enough money to pay the official to exert effort  $a = 1$  or more.<sup>6</sup>

5 Note that the probabilities of completing the tasks are not additively separable in  $\theta$  and  $\psi_i$ , so that the budget values at which the agency switches between tasks to perform under a binding resource constraint, analyzed in later sections, depend also on the talent level of the official. Results are not qualitatively different with different specifications of the probability of task completion, as long as it is increasing in  $\theta$  and decreasing in  $\psi_i$ .

6 Even if the budget is fully spent on one reward, for instance,  $R_i = D$ , under  $\gamma > D$  for activity  $a \geq 1$  marginal costs of the official’s effort,  $\partial c/\partial a \geq \gamma$ , will be higher than marginal benefits,  $(\partial p_i(a, \theta)/\partial a)R_i < D$ . In most situations, only lower values of  $\gamma$  are needed to keep the official’s effort and the probability of task completion in  $(0, 1)$ . The assumption that  $\gamma > D$  ensures this for any values of the remaining parameters and is unnecessarily strong, for instance, in cases when the head does not want to offer the full budget as a reward for one task. It will be relaxed in some numerical examples in the text.

For a given talent level  $\theta$ , the official chooses both which task to undertake and the effort he will make toward its completion, leaving the probability of obtaining a reward for completing the other tasks at zero. The official's payoff-maximization problem can thus be written as

$$\max_{i \in I} \left\{ \max_a (\theta^{\psi_i} a R_i - \frac{1}{2} \gamma a^2) \right\},$$

which returns a simple rule for the official's choice of task to take up.

**Lemma 1.** Given a contract  $R \in \mathbb{R}_{+,0}^n$ , an official with talent level  $\theta$  will undertake the task with the highest value of

$$\theta^{\psi_i} R_i. \tag{1}$$

Moreover, under the official's optimal choices of effort, the probabilities of task completion will be:

$$p_i = \frac{\theta^{2\psi_i} R_i}{\gamma} \text{ and } \forall j \neq i : p_j = 0,$$

if the official chooses to work on task  $i$ .

*Proof.* See [supplementary appendix](#).

Changing the contracted reward offered to officials, that is, will change what type of tasks they will take up and how likely it is that these tasks will be successful.

#### Contracts Offered by the Agency's Head

The head adds value to the governance of his institution by using his expertise to set tailored rewards to make the official take up suitable tasks. In so doing, the head is motivated by the expected benefits that the agency's activities bring to society directly, and also by self-presentation through impression management. The latter we formalize in two different ways. First, the head may have an interest in opening high profile cases, independent of the question of whether or not these cases will ultimately be successful from a legal point of view. This instantaneous incentive captures that exposure reflects on the agency's public image, as well as the head personally. Second, the head values any residual budget that is not spent on paying rewards. This residual budget is assumed to be fully spent on such noncase-specific activities, if only to avoid future budget cuts. Note that in pursuing social benefits, the head does not need to have an altruistic motivation: agency task completion can have entirely personal benefits, for example, professional reputation with expectations of future promotion. The setup does allow for analysis of a fully benevolent head as an extreme case.

Expected utility of a risk-neutral head that employs the representative official performing task  $i$  is

$$E[U^H] = p_i d_i + \phi d_i + V(D - p_i R_i).$$

The product  $p_i d_i$  is society's expected benefit from the agency's overall activity. The parameter  $\phi$  captures the

head's instantaneous incentive to open a high-profile case. For  $\phi > 0$ , he gains positive utility from opening cases with a potentially high impact on social welfare. Case avoidance would follow from  $\phi < 0$ . In addition, the head values spending the residual budget, being the difference between the budget  $D > 0$  and the expected payment to the official  $p_i R_i$ , as compared with the agency's performance by parameter  $V \in (0, +\infty)$ .<sup>7</sup>

If  $V = 0$ , all budget is offered as a contractual reward for successfully completing cases. Still, in expectation there is a nonzero budget residue available for impression management spending. The higher  $V$  the higher the head's tendency to channel funds away from rewarding tasks.<sup>8</sup> Note that  $V$  can capture a number of concerns the head may have, including his intrinsic motivation, workplace culture, the way in which he is evaluated by his superiors, and budget appropriation.

Given his incentives, and knowing the official's optimal response, the head solves

$$\max \left\{ \max_{i \in I} \left[ \max_{R_i} \left( \frac{\theta^{2\psi_i} R_i}{\gamma} d_i + \phi d_i + V \left( D - \frac{\theta^{2\psi_i} R_i^2}{\gamma} \right) \right) \right], VD \right\}$$

$$s.t. R_i \leq D \quad \forall i \in I.$$

Under the assumption that any contract is affordable in the agency's budget, this leads to the following simple optimal rule for the head.

**Lemma 2.** If the budget is nonbinding, by setting the appropriate rewards, the head will make the official with talent level  $\theta$  pick up the task with the highest value of

$$Q_i = \frac{(\theta^{\psi_i} d_i)^2}{4V\gamma} + \phi d_i, \tag{2}$$

as long as  $Q_i > 0$  for at least one task  $i \in I$ . Accordingly, the head will offer the official a contract (superscript "u" for unconstrained):

$$R_i^u = \frac{d_i}{2V}; \quad \forall j \neq i : R_j = ICC_j,$$

where  $i$  is the task for which [equation \(2\)](#) is highest and  $ICC_j$  is any value that satisfies the official's incentive constraint [equation \(1\)](#). These contracts lead to effort levels generating probabilities of task completion

$$p_i^u = \frac{\theta^{2\psi_i} d_i}{2\gamma V}; \quad \forall j \neq i : p_j = 0.$$

7 In the following, we assume  $D \neq 0$  to avoid degenerate cases. When  $D = 0$ , the agency performs none of its discretionary tasks and the utilities of both the head and the official, as well as the social welfare from the discretionary tasks, are zero.

8 In our formal analysis,  $V$  is assumed to be strictly positive to assure a solution exists. The case  $V = 0$  is discussed in later sections as a limit case that does not bring any new fundamental insights.

If  $Q_i \leq 0$  for all tasks  $i \in I$ , the head keeps all resources for financing the performance management and the contract offered becomes

$$R_i^u = 0; \forall i \in I,$$

amounting to probabilities of task completion

$$p_i^u = 0; \forall i \in I.$$

*Proof.* [supplementary appendix](#).

The head thus discretely allocates the budget at his disposal, either to tasks or not, depending on the relative parameter values, in which case he focuses exclusively on performance management.

For every task,  $R_i^u$  is independent of the agency's budget and talent pool. It depends only on the head's preference for extraction  $V$ , since once the task choice has been made,  $\theta$  influences only the probability of task completion. Even when resources are unlimited, there is a maximum reward that the head is willing to offer to the official, as he will prefer to extract any remaining resources above that reward level, due to diminishing returns to rewards offered. While more talented officials might not be offered higher rewards, in expectation they will still earn more than officials with a lower  $\theta$ , as they can produce a higher probability of task completion with the same effort.

If the head's preferences are aligned with society's, that is, for  $\phi = 0$  and  $V = 1$ , the head incentivizes the pickup of those cases that maximize the expected returns from the agency's activities minus their expected costs,  $p_i d_i - p_i R_i$ . He would choose to reward the task with the highest  $\theta^{\psi_i} d_i$  with contracts  $R_i^u = d_i/2$ , which represent an optimal balance between the benefits of completing the tasks and the costs of making the official pursue them properly in terms of effort level. Do note, however, that the head still pockets the budget residue. Only if  $V$  was allowed to attain its lower bound,  $V = 0$  (and for  $\phi = 0$ ), does the head allocate the budget entirely on pursuing cases. His choice of rewards would then always be  $R_i = D$ .<sup>9</sup> For  $\phi < 0$ , the head leans toward pursuing cases with a small impact on social welfare upon successful completion. If his disutility of action is too high, so that  $Q_i \leq 0$  for all tasks, the head rewards no tasks and spends all available budget on impression management, giving him a utility of  $U^H = VD$ .

The head limits his choices to only a subset of the agency's task portfolio  $I$ , based solely on the tasks' characteristics  $\psi_i$  and  $d_i$ . Lemma 3 establishes that the head will never incentivize—and so the staff never pick up—tasks that are both more difficult to complete and

yield lower returns upon completion than another task in the agency's tasks set.

**Lemma 3.** Take two tasks  $\{A, B\} \in I$ , such that  $d_A > d_B$ . If  $\psi_B \geq \psi_A$ , the head will always prefer either task  $A$  or no task at all over the pickup of task  $B$ .

*Proof.* See [supplementary appendix](#).

The task ordering that Lemma 3 establishes holds for any budget levels, not just for nonbinding values of  $D$ . Note that while the head could prefer a task that is both more difficult and brings lower benefits upon completion if he gained substantial disutility from opening tasks ( $\phi d_i < 0$ ), the proof to Lemma 3 shows that the head will then always prefer incentivizing no task at all. We can thus focus only on those tasks that are not dominated in the sense that there is no task that would be both easier to complete and yield higher benefits upon completion. The remaining tasks we can order as  $(d_1, \psi_1) < (d_2, \psi_2) < \dots < (d_m, \psi_m)$ , so that the most difficult task is also the most beneficial to society.<sup>10</sup> A complex high-profile case (simple basic task) is associated with high (low) values of both  $(\psi_i, d_i)$ .

To obtain some further insight into the head's strategy when the budget is nonbinding, first consider the case where  $\phi = 0$ . The head's objective then reduces to maximizing  $\theta^{\psi_i} d_i$ , so that task  $A$  is picked over task  $B$  if  $\theta^{\psi_A - \psi_B} > d_B/d_A$ . Without the incentive to flash high-profile cases, the head's extraction plays no role in determining which task will be performed. Suppose that task  $A$  is more difficult, that is,  $(d_B, \psi_B) < (d_A, \psi_A)$ . The head then compares the ratio of  $\theta^{\psi_A}$  and  $\theta^{\psi_B}$ , which are the terms by which the probability of the task's completion is scaled, with the factor by which completing task  $B$  is less worthwhile to society than completing task  $A$ . When the official's talent level  $\theta$  increases, the more difficult task  $A$  becomes more attractive for the head. That is, if the official is skilled enough, the agency will perform more difficult tasks. More difficult tasks will also be performed when the social benefit from completing task  $A$  is sufficiently much higher than from completing the low-yielding task  $B$ .

If either  $\phi$  or  $V$  is high enough, impression management is so important to the head that it overrides the influence of staff quality as a determinant of the agency's behavior, and only complex tasks will be performed. In fact in that case, irrespective of the official's talent, the head expects to be able to extract a higher budget residue thanks to a lower probability of the official successfully completing complex tasks and the higher fixed reward from exposure through the high-profile cases.

<sup>9</sup> It is for this reason that we have bounded  $V$  away from zero in this section, since the budget is assumed to be unlimited and the head's problem would otherwise have no solution.

<sup>10</sup> Here,  $m \leq n$  since  $n - m$  task were excluded from the set via the above mechanism.

## Binding Discretionary Budget and the Agency's Task Focus

We now turn to the role of the size of the budget that is at the head's discretion. Note that for any value of  $D$  above the head's optimal reward offer for his most preferred task, changes in  $D$  only influence the head's utility through a different budget residue, not the optimal contract. However, once  $D$  falls below the head's optimal reward offer for his most preferred task, the agency may come to perform different tasks under different budget constraints, leading to discontinuities in social welfare. To clarify how, we focus on changes in the agency's performance when there are only two possible tasks,  $A$  and  $B$ , ordered as  $(d_B, \psi_B) < (d_A, \psi_A)$ . As the budget effects are most pronounced when the head derives positive utility from opening new cases, we focus on  $\phi > 0$ .

The following result is obtained on how the budget constraint determines which tasks the agency will perform.

**Proposition 1.** The agency changes its focus at critical discretionary budget values in the following way:

- (i) For  $\phi$  small enough and  $\theta^{2\psi_A} d_A < \theta^{2\psi_B} d_B$ , there exists a critical budget value  $D_1^*$ , so that the agency performs task  $A$  when  $D \leq D_1^*$  and task  $B$  for some budget interval above  $D_1^*$ .
- (ii) Only if  $D_1^*$  exists may there exist a critical budget value  $D_2^* \geq D_1^*$ , so that the agency performs task  $B$  when  $D_1^* < D < D_2^*$  and task  $A$  for the budget interval above  $D_2^*$ . A sufficient condition for such  $D_2^*$  to exist is  $Q_A \geq Q_B$ .

*Proof.* See [supplementary appendix](#).

Whenever  $\phi$  or the relative probability of success with a landmark case is large enough, the head will incentivize task  $A$  for all budget values. Otherwise, the intuition for the agency's change in focus from the more difficult to the simpler task at a low enough budget is as follows. Assume that with enough budget the head prefers to incentivize the more complex task. Since  $R_A^u > R_B^u$ , as  $D$  goes down from nonbinding high values, this first starts influencing the probability of completing the more complex task and the utility it generates for the head. As soon as the budget is binding, the head will put it all toward incentivizing his designated task, rather than spreading it between the ex ante reward and impression management activities directly.

As the budget is reduced further, the head suffers two types of utility loss. One is from his inability to still sufficiently incentivize his staff to exert effort on completing the complex task to society's benefit. The other is from a reduced expected budget for impression management. At some point, the head may then switch from stimulating the take up of the complex

task to rewarding the simple task. However, when the budget is decreased below the head's most preferred reward for the basic task, the official's effort decreases further alongside the probability of the completion of the simple task.

As the head's fixed incentive to open a case,  $\phi d_i$ , is constant, for low enough budget values it becomes the most important determinant of the agency's performance. Since  $\phi > 0$ , for those low budget levels the head will simply prefer the tasks with the highest fixed reward just for opening them. In addition, the probability of the head actually paying the reward for completing the complex task will be low, thus increasing his expected budget residue. This latter combination of effects also provides the intuition behind the existence of the critical budget values of the type  $D_1^*$ .

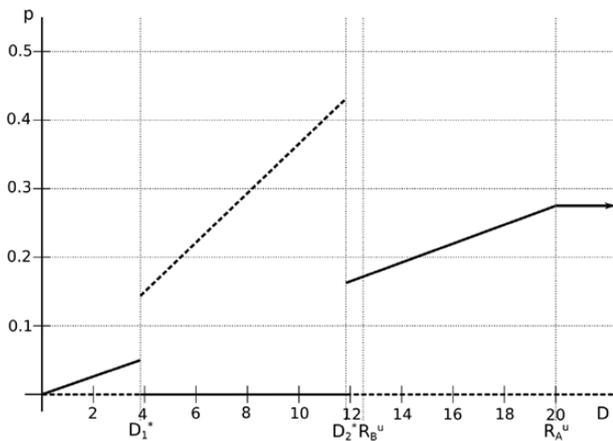
Moreover, the switch to the basic task for intermediate budget values only happens when there is a moderate difference between the tasks' benefits, or a high difference between the tasks' difficulties, while the head is primarily concerned with social welfare. If these conditions are violated, the head cares too little about society's benefits to mind the ineffectiveness of trying to incentivize the complex task with too little budget. In other words, the head keeps pushing his staff to open complex high-profile cases, knowing they will most likely fail to complete them successfully, just to enjoy the exposure that such cases generate, while pocketing the unclaimed rewards for impression management purposes.

Whereas variations in the agency's discretionary budget will generally affect its focus of attention, there are two scenarios in which there is no shift in the agency's priorities for any budget values. First, when  $Q_A \gg Q_B$ , task  $A$  is just rewarding enough for the head to keep the agency at it no matter the budget. Second, when  $B$  is the head's most preferred task without a binding budget constraint and  $\phi = 0$ , the agency will perform task  $B$  for all budget values above zero, since there is no fixed reward for opening a case.

**Figure 1** illustrates the effect of budget changes on the agency's case focus for one particular parameterization.<sup>11</sup> For nonbinding budget values, the head prefers the more complex task  $A$  and rewards it with a constant reward  $R_A^u$  upon successful completion. Once the budget falls below  $R_A^u$ , the reward offered for task  $A$  becomes  $D$ . A linear decrease in  $D$  then causes a linear decrease in the probability of the completion of task  $A$  through the official's behavior described in Lemma 1.

As the available resources decrease, so does the head's opportunity to extract them for impression

11 In the example in [figure 1](#), parameter values are:  $\theta = 0.5$ ;  $(\psi_A, \psi_B) = (1.8, 1.1)$ ;  $(d_A, d_B) = (400, 250)$ ;  $\gamma = 6$ ;  $V = 10$ ;  $\phi = 0.07$ .



**Figure 1.** Probability of Completing the Simple Task *B* (Dashed Line) and the Complex Task *A* (Solid Lines) as a Function of the Available Budget

management purposes. Opening complex tasks despite having insufficient funds to induce the effort to complete them successfully still generates exposure. The increase in the expected residual budget from a lower probability of completing complex tasks is no longer as attractive for the head, as the total amount of money to be had is little. Instead, the agency's performance gains a relatively high importance in determining the head's overall utility, so that he changes the contract with the official to incentivizing task *B* below point  $D_2^*$ . Moreover, with a decrease in  $D$  on the interval  $(R_B^u, R_A^u)$ , the head's utility generated by rewarding task *A* decreases at a higher rate than the utility from rewarding task *B*—which itself decreases with the slope  $V$ , the head's marginal loss of resources to extract—up until point  $R_B^u$ . This second intuition may cause  $D_2^*$  to be higher than  $R_B^u$ .

The less the head values impression management, the bigger the interval  $(D_1^*, D_2^*)$  will be. If the head cares only about real cases, that is,  $V = 0$  and  $\phi = 0$ , the agency will perform the more complex task only when its officials have high enough talent levels  $\theta$  as compared with the difference between the tasks' benefits and difficulties, and a high enough discretionary budget  $D$ . Performing complicated tasks requires talent, combined with sufficient resources to motivate those officials skillful enough to perform them. In determining whether there will be a nonzero probability of completing task *A*, talent levels and the budget act as imperfect substitutes: a higher (lower)  $D$  always means that lower (higher) talent levels are needed in order for the agency to perform task *A*.

The opposite is not always the case. Some talent values can make the budget constraint irrelevant as a determinant of the *type* of task performed—however, not the *extent* by which it is performed, that is, the probability of completion. If  $\theta^{\psi_B} d_B > \theta^{\psi_A} d_A$ , which can be the case if the official's talent is close to zero,

only task *B* will be performed for any budget value. Similarly, if the official's talent level is close to one, only task *A* is performed and there is no budget interval in which the agency shifts to the simpler task *B*.

### Welfare Implications of the Agency's Focus Shifts

The budget-induced priority switches between high-profile and basic cases do not generally serve society's interests. Social welfare is, however, not obviously defined, as the net benefits of impression management spending are ambiguous. Public perception of a strong agency is likely to help compliance, yet a case's visibility may contribute more to its image than its merit. On the other hand, zealous enforcement can fuel suspicion of the agency being politically bound, poorly informed or myopically focused, and give away crucial information about the agency's thinking to the initiated. Generally, the social welfare gains from handling cases are different from the gains generated by impression management spending. We begin analyzing welfare by assuming that impression management on balance does not benefit society. We then discuss how the qualitative results carry through when relaxing this assumption. We conclude with some remarks on optimal discretionary authority.

#### Case-Specific Welfare Effects

An agency is needed to implement any task, but the budget that society provides it with might end up being used for socially unproductive purposes. With the agency spending its budget entirely, the expected social welfare is

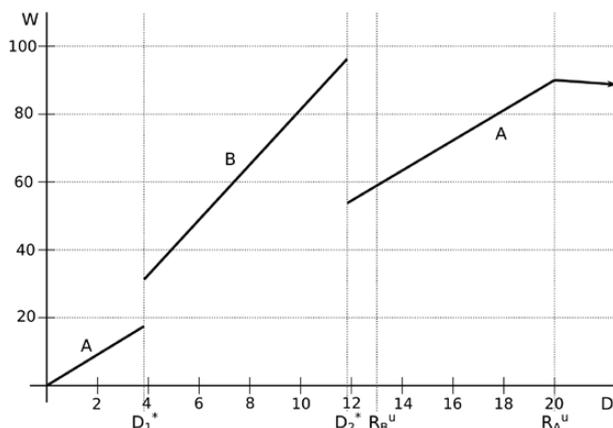
$$E[W] = \sum_{i \in I} p_i d_i - D,$$

since tasks that the agency has not picked up have probability zero of completion. For analytical convenience, we assume that the head's and the official's private utilities are negligible in total welfare.

In principle, with perfect information on the functional forms and the values of  $\theta$ ,  $\forall i : (d_i, \psi_i), \phi, V, \gamma$ , it is possible to determine the social welfare-maximizing budget level in any given case. A government would typically not have this complete knowledge, however. It is therefore more interesting to study the welfare implications of a range of possible budgets—including those that would be socially optimal.

While the head's utility is continuous in the assigned budget, social welfare is not. It changes discretely then with the agency's task switches. Consider figure 2, which continues the two-task example set up in figure 1, for which social welfare reduces to:

$$E[W] = p_i d_i - D,$$



**Figure 2.** Social Welfare as a Function of the Available Discretionary Budget

where  $i$  is the task rewarded by the head (if any) and pursued by the official. When the budget is non-binding, social welfare declines at a rate that is proportional to the resources spent, since any additional resources provided to the agency are extracted by its head.

Figure 2 illustrates that social welfare is discontinuous at the points where the head switches between the contract designs. Social welfare is linear in the probabilities of task completion, so that it is a linear function of the budget whenever the two probabilities are linear in the budget. There is a jump in welfare at points  $D_1^*$  and  $D_2^*$ , where the head decides to stop rewarding the complex task when the budget drops below the critical value  $D_2^*$ , yet reopens the task once  $D$  drops below  $D_1^*$ . These jumps can be of a very substantial size—around half of the total welfare in our example.<sup>12</sup>

For this head, the global welfare maximum is at  $D_2^*$ , where the agency perfectly performs task  $B$ . A slightly higher budget edges the head to incentivize task  $A$ , which he can insufficiently do. A substantial budget cut instead is better for society. If the budget is below  $D_1^*$ , the head suboptimally incentivizes its staff to work on complex tasks they cannot deal with properly. With staff quality changing only gradually in larger agencies, the head's inclination is crucial in determining the locations of the welfare jump points. Without perfect information, the government would be unable to identify the optimal discretionary budget. For example, for budget levels just over  $D_2^*$  marginal welfare is positive in  $D$ , which suggests that it is optimal to further increase the budget, whereas in fact a discrete welfare increase can be had by slightly decreasing the budget below  $D_2^*$  so that the agency shifts down to task  $B$ .

<sup>12</sup> The size of the jump at points  $D_1^*$  and  $D_2^*$  in figure 2 is given by  $\Delta W_{A,B} = D^* \times (\theta^{2\psi_A} d_A - \theta^{2\psi_B} d_B / \gamma)$  for budget values below  $R_B^u$ .

Proposition 2 generalizes how the jumps in welfare go in a predetermined direction.

**Proposition 2.** For small discretionary budget changes that pass any critical budget value  $D^*$ :

- (i) A budget cut that makes the agency switch from complex to basic tasks increases social welfare discontinuously. Likewise, a budget increase bringing  $D$  above such  $D_2^*$  reduces welfare, even if  $D$  is still below its welfare-maximizing level.
- (ii) A budget cut that makes the agency switch from basic to more complex tasks decreases social welfare discontinuously. Likewise, a budget increase bringing  $D$  above such  $D_1^*$  improves welfare.

*Proof.* See [supplementary appendix](#).

A head who derives positive utility from show cases, is more willing to open high profile cases than is good for society, for the instantaneous utility in them, plus the higher expected residual budget for impression management spending. Society always prefers at least some agency performance, however small, to using all resources for impression management activities. The reason for this is that while social welfare can in principle be negative for all budget values—for example, when the tasks' benefits are very low or the official's cost parameter  $\gamma$  is very high—it will always be negative when the agency performs no task at all. The agency's operations will then cost society its full budget  $D$  and will produce nothing in return. If the agency were to return any leftover budget, society would prefer to shutdown at a low enough budget.

Finally, note that society is better off not rewarding any of the tasks and simply keeping the discretionary budget if the official's costs of effort are very high compared with the tasks' benefits and difficulty. In that case, the expected social benefits of the agency's discretionary activities do not justify the "investment" by society in additional rewards. Incentivizing an official with a high  $\gamma$  comes at a high cost to society but not to the head, who wants to offer nonzero rewards for task completion as long as  $\phi \geq 0$ , irrespective of the official's costs, since lower effort caused by a higher  $\gamma$  translates into a higher expected residual budget for the head to spend. In addition, he prefers to flash high-profile cases.

### Social Benefits From Impression Management

If noncase-specific activities do generate welfare, our general findings carry through, with some qualifications. If society values the opening of big cases, overall welfare increases. The head's incentive to open high-profile cases,  $\phi d_i$  in the head's utility function, may be mirrored by  $\phi^S d_i$  in the social welfare function, in which  $\phi^S$  is the instantaneous social welfare gain of opening a case. Obviously, agency behavior

remains unaffected by this. The social welfare functions in figure 2 shift up by  $\phi^S d_i$ , more for the intervals where task *A* is being performed (since  $\phi^S d_A > \phi^S d_B$ ), so that the size of the discontinuous jumps decreases. If society also values the impression management utility from opening tasks less than the head ( $0 < \phi^S < \phi$ ), the existence and direction of the jumps remain unchanged. If  $\phi^S > \phi$ , the sign of the jump also depends on the head's (and society's) valuation of the discretionary budget spent on noncase-specific activities.

The discontinuity of welfare in *D* also remains if society values noncase-specific activities. At  $V^S$ , social welfare would then have the form  $E[W] = p_i d_i - V^S p_i R_i + V^S D - D + \phi^S d_i$ . The social welfare function becomes concave on its continuous parts. In the special case in which the head is fully benevolent,  $\phi = \phi^S$  and  $V = V^S$ , the social welfare function becomes continuous, since it is identical to the head's utility function up to constant  $-D$ .

Generally, there will be a difference between the head's utility and social welfare, amounting to jumps in the social welfare function. Again, the sign of the jumps remains unchanged for the most relevant (and defensible) case  $\phi^S < \phi$  and  $V^S < V$ , where the head gains utility from the impression management and in addition the social welfare it generates.<sup>13</sup> Society's valuation of the residual budget has, however, an effect on the size of the jumps in the welfare function—they become smaller since  $V^S \neq 0$  effectively makes the welfare function more like the head's utility. The differences between  $(V, \phi)$  and  $(V^S, \phi^S)$  determine the locations and sizes of the jumps.

Similarly, does the discontinuity of welfare in *D* remain if any budget residue is returned to society. Social welfare would then be  $E[W] = p_i d_i - p_i R_i + \phi^S d_i$  since  $V^S = 1$ , against the objective of the head  $E[U^H] = p_i d_i - V p_i R_i + V B + \phi d_i$ . If the budget residue is not at the head's discretion and therefore  $V = 0$ , this difference remains, as the head's objective function is  $E[U^H] = p_i d_i + \phi d_i$ . Obviously, all of this adds to the complexity for the government to identify optimal budget changes.

#### Optimal Discretionary Authority

By carefully determining the budget part *D* over which it gives the head discretion, society can keep the head in check, while also benefiting from his expertise in determining the best staff talent-task matches. The optimal split of the total budget crucially depends on the welfare that is generated by generic tasks, relative to what can be obtained in addition through discretionary

spending. Let *F* be the part of the generic budget in which welfare is smooth, including expenses for work facilities and support staff, as well as fixed wages for regular agency activities. The government would, in principle, want to divide any budget total between *D* and *F* so that the marginal welfares generated by the two budget parts are equalized, with two caveats.

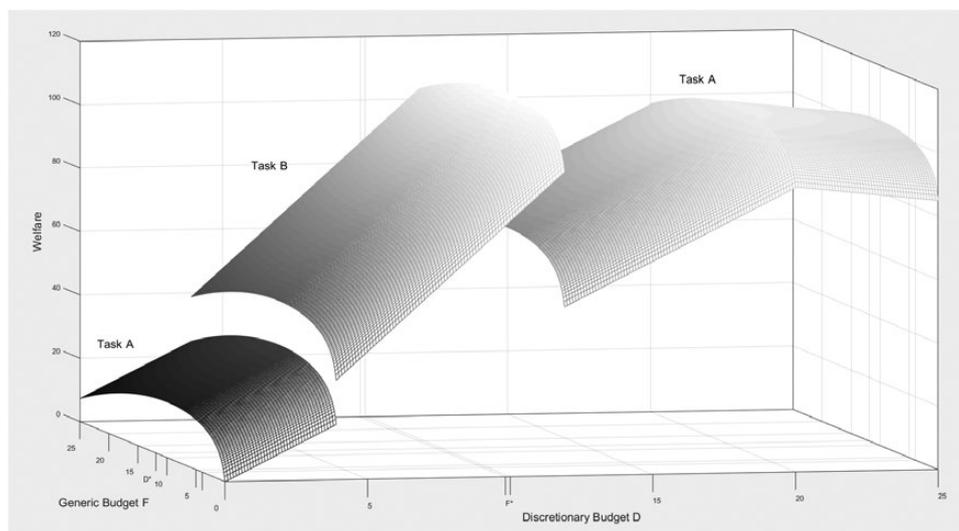
First, such a split might not exist due to the discontinuities in the welfare function of the discretionary spending. In that case, the division should be made so that the discretionary funds are kept on the "right side" of the jumps and the remaining funds are assigned to the performance of the generic tasks. Second, equating the marginal welfare gains is not sufficient for attaining the optimal division, since welfare is nonmonotonous in *D* and typically has several local maxima. A welfare-maximizing division of a given total budget thus has to be determined on a case-by-case basis, requiring information about the agency's inner workings the government would typically not have.

Figure 3 provides a graphical illustration of the problem faced by government for the baseline case in which the noncase-specific spending is unproductive.<sup>14</sup> We assume that *F* has diminishing returns to society, that is, the (expected) welfare function is strictly concave with a maximum at point  $F = F^*$  above which the marginal benefit of funding the agency's generic tasks is lower than its marginal costs.

Note that for  $F = 0$  (front box vertical plain), the welfare function is the same as in figure 2. For  $D = 0$  (right box, vertical plain), social welfare is solely a function of the generic spending with the above-mentioned properties. Should the government have perfect information, the optimal total budget and the optimal budget split can be simply found using the global maxima. If the total budget is suboptimal, the best optimal split can be determined by moving alongside the  $(D, F)$  plain. Whenever a discontinuous jump in total welfare occurs alongside the discretionary budget *D*, the government will keep the discretionary resources on the "right side" of the jump and finance the generic tasks with the remainder. For instance, if the discontinuous increase in the welfare function alongside *D* is sufficiently high, the government will at some point abruptly need to start allocating a large part of the total resources to the discretionary budget and increase the financing of the generic task *F*. If impression management activities also generate welfare, the heuristics of finding the optimal total budget and optimal budget division do not change. The more social

13 For  $\phi^S > \phi$  and  $V^S > V$ , the jumps go in the opposite direction. The remaining cases are ambiguous and depend on other parameter values.

14 The discretionary budget *D* follows the welfare function in figure 2, which has a maximum  $D^*$  at a point where the agency performs task *B* at the maximum level, that is,  $D^* = D_B^*$ . The welfare function of the generic budget is given as  $6 \ln(3F + 1) - 3F^2/100$  with a maximum at  $F^* \cong 9.83$ .



**Figure 3.** Welfare Generated by the Total Budget Split into Generic and Discretionary Spending

benefits come from impression management, the more the head should be given discretionary space and influence over the budget split.

### Agency With Several Officials and Multiple Tasks

The main insights derived above extend to agencies with several officials and types of tasks, under the following three assumptions. First, that contracts can be individualized and the head can fully discriminate among his officials, which is in line with the head having full information about his staff's qualities. Second, that the probabilities of task completion are independent across officials performing one and the same task, that is, there is no interaction or economies of scale or scope—which can be thought of as each official individually working on a different task of the same type. Third, that the budget implies an upper limit on the reward for each official—that is, in case the agency employs  $m$  officials, the head uses up to  $1/m$  of the total discretionary resources to motivate each official.

The mechanics of the head's switching between the available tasks remains unchanged. The head's most preferred task for each official without a binding budget is given by Lemma 2. The main difference when more tasks are available to the agency is that there can be more critical values of the budget at which the head switches the agency's focus. One of these tasks will still be more difficult and will yield higher benefits upon completion. Lemma 3 holds for each pair from any number of available tasks.

The head always has one preferred task for the official to perform for a given budget value, and the changes in priorities are always between two tasks, just as described in Proposition 2. Moreover, the intuition

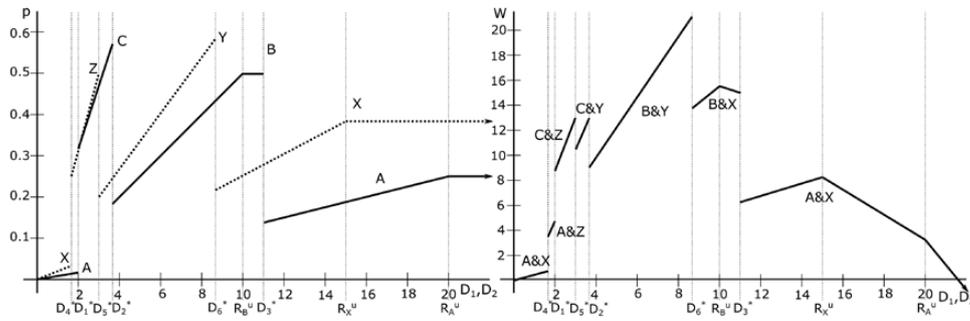
of Proposition 1 directly implies that for the lowest budget values the head will always incentivize the most complex tasks, as they have the highest fixed reward for opening. Only if  $\phi = 0$  will the agency continuously perform simpler tasks as the discretionary budget depletes toward  $D = 0$ . For an agency with  $k$  officials and  $n$  tasks to choose from, there are between 0 and  $k \times n$  jumps in performance, as the head's level of discretion decreases.<sup>15</sup>

Figure 4 (left) depicts a simple parametrization, in which the agency entails two officials and there are three types of tasks that each of them can perform.<sup>16</sup> The two officials,  $O_1$  and  $O_2$ , differ in their talent level,  $\theta_{O_1} < \theta_{O_2}$ , while the tasks are ordered by difficulty as  $(d_A, \psi_A) > (d_B, \psi_B) > (d_C, \psi_C)$  for official  $O_1$  and  $(d_X, \psi_X) > (d_Y, \psi_Y) > (d_Z, \psi_Z)$  for official  $O_2$ . For each budget interval, staff might get “assigned” a different task via the contract design. The contracts offered to each of the two officials and the resulting tasks picked up are still governed by Lemma 2 and Proposition 1.

Figure 4 (right) displays the welfare function of the above illustration of the agency's performance when impression management is socially unproductive. Along every continuous part of the social welfare function, each official picks one task as is indicated in the figure. The jumps in welfare follow a pattern similar to

<sup>15</sup> For each official, there can be up to  $n - 1$  jumps from the more difficult task to simpler tasks, as well as in addition for the lowest budget values, a jump back to the most complex task with the highest fixed reward for opening a case.

<sup>16</sup> In the example in figure 4, the head considers the perceived tasks' benefits in his objective and the parameter values are:  $\theta_{O_1} = 0.5$ ;  $(\psi_A, \psi_B, \psi_C) = (2, 1, 0.2)$ ;  $(d_A, d_B, d_C) = (80, 40, 20)$ ;  $\theta_{O_2} = 0.6$ ;  $(\psi_X, \psi_Y, \psi_Z) = (2, 1.07, 0.2)$ ;  $(d_X, d_Y, d_Z) = (60, 36, 20)$ ;  $\gamma = 5$ ;  $V = 2$ ;  $\phi = 0.05$ . The head uses half of the budget to incentivize each official, that is,  $D_1 = D_2$ .



**Figure 4.** Probabilities of Task Completion (Left) and Possible Welfare Effects of Discretionary Spending (Right) in an Agency With Two Officials,  $O_1$  (Solid Lines) and  $O_2$  (Dashed Lines), and Three Tasks

that in the two-task case. There is an increase in welfare when the budget falls below a critical value for other than the lowest values, caused by a decrease in the expected resources spent on impression management. However, for lower discretionary budget values, the incentive to open big cases for presentation purposes causes a prioritization toward complex tasks, to the detriment of social welfare.

For budgets above  $R_A^u$ , prioritizing the complex task  $A$  generates negative welfare, since incentivizing it serves the head's personal preferences for impression management, but this type of task is too complex for society's good.<sup>17</sup> The much higher benefits that would materialize upon its completion cannot offset the low probability of success for this hard task. Similarly, the social benefits from task  $X$  are decreasing in resources above  $R_X^u$ , where the reward for official  $O_2$  reaches its cap, and are below zero for large enough budgets. Social welfare can also be negative for low or intermediate budget values. In such cases, society would be better off dismantling the agency altogether, rather than getting the discretionary budget constraint wrong.

Alternative specifications do not qualitatively change these results. Should an agency have to offer all or some of its officials the same incentive contracts, the head could still write one or several universal contracts that include cut-off values in the reward structure. Effectively, officials with a talent in certain intervals would choose to perform certain tasks. Because of the incentive constraints, the head might then have to leave information rents to some officials to induce them to perform certain tasks, yet the main results would carry through. The same is also true for allowing officials to jointly work on a case and so affect its probability of successful completion.

The budget constraint could also be modeled alternatively as the maximum total money spent if every official who is offered a reward is successful in completing

its task. If such a reallocation of resources among officials becomes part of the head's decision space, the model dynamics would change substantially, since a change in the budget can then amount to changes in any number of contracts between the head and the officials, and the head would get to decide for which officials or tasks the budget is effectively (non)binding, resulting in jumps in the agency's priorities and welfare.

### Implications for Institutional Design: An Antitrust Case Study

The size of the discretionary budget is a control tool in the institutional design of government agencies with important welfare implications that depend on such characteristics as the staff skill levels, means of secondary and tertiary performance rewards, and the personality of the head. For a government that has to save a certain amount across different agencies, our model suggests that these cuts be allocated where there is a bigger chance for a higher welfare jump upwards—that is, where agencies have taken on high-profile cases that are too ambitious for their limited means. It will be difficult to tell how close to a welfare jump any given agency is, however, and hence what the optimal cuts and reassignments would be. In many agency practices the truly discretionary budget is also stochastic, as high-priority cases—be it a terrorism threat, a tax scandal, or a merger notification—present themselves unannounced and must then be dealt with immediately.

One possible instrument to better control priorities is to compartmentalize the discretionary budget, earmarking parts for designated classes of cases. The organization may be set up to this effect, with departments that are given dedicated tasks and matching resources. To do so and to improve welfare, however, still requires a considerable amount of information. While requirements on an agency to return any left-over budget appear appealing to impose, they may not be effective, either. Even if a government were able to tell what amount of the budget had not been spent on which cases, the restitution requirement would lead to

<sup>17</sup> The difficulty of task  $A$  is set to generate zero social welfare up to  $R_A^u$  when performed by an official with talent level  $\theta_{O_1}$ , so that all welfare in intervals where task  $A$  is performed comes from the activity of the official  $O_2$ .

rewards going up, as the head would no longer care about a residue and would rather spend the entire budget. This might lead to a different type of wasteful spending, even though the incentives of the head are now more aligned with society's interests.

Another possible institutional design element that could help counter the head's urge to extract budget is to feed back directly into its budget a part of the revenues from fines imposed by the agency. This introduces a different type of potentially perverse incentives for agencies. It would encourage picking low hanging fruits with little social harm for their fine revenues. Yet, a fine return would in principle counter the head's inclination to spend resources on cases that are a likely loss for their short-run impression management features. The more indirect feedback from agency success into budget increases over time may therefore be a better instrument for curbing excessive impression management. Yet it presupposes the ability of the government to properly evaluate what constitutes agency success.

Our model provides a formal context to arguments put forward in an emerging literature on the institutional design of competition authorities. Competition law principles are generally formulated, whereas cases are specific, various, and regularly novel.<sup>18</sup> As a result, competition authorities such as the US DoJ's Antitrust Division, the FTC, and the European Commission's DG Competition have considerable discretion in enforcement.<sup>19</sup> Between monopolization and collusion cases, for example, the former are often harder, take longer, and are more complex to prosecute successfully than cartels, which are per se illegal by object. Within the class of cartel investigations, there is a choice between pursuing cases by active own detection or dealing with leniency applications.

Competition agency heads appear to value noncase-specific activities, contributing regularly in conferences and the media.<sup>20</sup> Against known companies, competition cases are sure to attract media attention right from the opening of the investigation. Originally zealously pursued, in the past, landmark cases have ended without a forceful application of the law. Throughout 1970s, the US DoJ unsuccessfully prosecuted IBM for the violation of Section "A Model of Government Agency" of the Sherman Act, to ultimately conclude in 1982 that the case was without merit.<sup>21</sup> The US Microsoft case turned after the Clinton administration ended. The FTC announced it could not challenge

Google for monopolization by "search bias" under American law in a press conference that was broadcast live on national television. Yet the European Commission went ahead against Google for abuse of dominance, and currently various leading political voices in the US call for breaking up the Big Tech. Recent cases, such as Booking.com and Facebook, as well as the State aid investigations into Starbucks and Apple attracted wide attention, also for greater social concerns of privacy and tax evasion.

The head of the DoJ is a presidential appointee and enforcement in the United States displays political business cycles.<sup>22</sup> Kovacic, Hollman, and Patricia (2011) documents that competition authority heads have concerns other than social welfare alone, including "appearing to be busy," with an eye to the media and political superiors. Competition authorities may be wasting effort on big good-looking cases and image, while under-performing in other tasks like suggesting legislation refinements and staff preparation for advanced enforcement. We show a transmission from budget to priorities that pivots around the head.

Institutional mergers are a popular form of agency reform also in antitrust. In the United States, the debate on merging the DoJ's Antitrust Division with the FTC into one competition authority has been long, yet rather academic. In Europe, meanwhile, several Member State authorities, including those in the United Kingdom, the Netherlands, and Spain, have recently gone through extensive institutional reorganizations, that also included mergers with other agencies such as sector regulators and consumer authorities. An emerging literature studies the effectiveness of such institutional changes for market oversight by looking at the costs of the merger itself versus merger-specific efficiencies in eliminating dual enforcement and expected gains from complementarities, the importance of a unified mission, and effects from regulatory competition lost.<sup>23</sup>

Our model points at the importance of the interaction between the combined talent pools and resources of the previously separate agencies, together with the new head's objectives, in determining the emphasis that the merged agency will lay in the execution of its enlarged set of tasks. While there may be synergies in enforcement, an institutional merger can result in the more expertise and resource-demanding duties being largely abandoned, if the two original agencies differed sufficiently in their tasks and talent pools, so that new smaller budget is channeled to incentivize mostly simple basic cases, at the expense of the complex major tasks. Such a shift in the agency's performance may be accompanied by a sudden unanticipated increase in social welfare. On

18 See, for example, Muris (2005), Crane (2011), Kovacic and Hyman (2012), and Wils (2011).

19 Weingast and Moran (1983) seminally studied the relationship between Congress and the FTC as a principal-agent problem.

20 Also, there are numerous competition policy outreach products, including enacted movies, comic strips, and online games, that agencies spend resources on. Some of these can be found on the ICN's web-blog on "outreach."

21 See Fisher, McGowan, and Greenwood (1985).

22 See Ghosal and Gallo (2001).

23 See Crane (2011) and Blumenthal (2013).

the other hand, the head can possibly use the joint discretionary budgets across the merged agencies to increase the reward for a particular set of tasks, while decreasing other rewards, to ambiguous welfare effects. Among other things, our model can advise on the types of tasks that would be best combined under one roof.

We show how both institutional design and budget can be used to pursue political goals or promote private interests. By either steeply reducing the budget or, instead, over-financing an agency run by an ambitious head, the focus of attention can be shifted from low-risk welfare-increasing tasks to high-profile cases that will ultimately fail. A more reserved head can instead be pushed into inertia by just slightly cutting the budget. Similar effects follow from extending the spectrum of tasks the agency is made responsible for, without also offering a matching budget. Parliaments would best control their governments to not abuse these mechanisms, if they value the independence of their government agencies. While instructions and the administrative procedures of an agency are instruments to do this, so is replacing the agency head.

Competition authorities also illustrate how institutional design and budget assignments can fundamentally affect the political independence of government agencies. Gal (2004) observes that there are important differences in the effectiveness of competition law enforcement among developing countries, even if their legal background is similar, in large part due to a deliberate lack of funding. Choke of resources turning performance may be bluntly significant in developing countries as well. The European Commission recognized it “high time” with the ECN+ program that the independence of national competition authorities in the Member States be guaranteed in specific legislation, after having observed: “[...] the misuse of NCA budgets by governments to gain leverage or as retaliation measure when decisions do not please them, for instance, by reducing or limiting budgets.”<sup>24</sup>

In December 2018, Directive 2019/1 was signed into law. It specifies that Member States must ensure that the staff and persons who take decisions in national administrative competition authorities:

[...] are able to perform their duties and to exercise their powers for the application of Articles 101 and 102 TFEU independently from political and other external influence.<sup>25</sup>

To safeguard that competition authorities can prioritize and execute their tasks impartially and independently,

24 “The Independence of National Competition Authorities,” speech delivered by Alexander Italianer, Director-General for Competition at the European Commission, at Competition Conference—Best Practice in Investigations, Vienna, December 12, 2014.

the Commission concluded that it is important to: “[G]rant of a separate budget with budgetary autonomy for NCAs.”<sup>26</sup> That is,

Member States shall ensure that national competition authorities are granted independence in the spending of the allocated budget for the purpose of carrying out their duties as set out in paragraph 2.<sup>27</sup>

Our model shows that the transmission from budget to priorities is subtle also in well-resourced agencies. By edging the discretionary part of the agency’s budget over certain threshold values, a government can qualitatively affect the agency’s task pickup to its liking. The budget can act as an indirect instrument of political control over agencies, even large and autonomous ones.

### Concluding Remarks

In government agencies with multiple tasks, to be picked up by staff with varying talent, managed by a head who balances several interests, the size of an agency’s discretionary budget influences not only the scale but also the type of tasks it will engage in. Social welfare is nonmonotonic and discontinuous in the agency’s budget. Small changes in the budget over certain thresholds may cause extensive restructuring from major to minor tasks, or vice versa. For lower binding budgets, the head who values exposure continues to suboptimally incentivize work on complex tasks, when the agency should have shifted down to simpler tasks. Therefore, looking locally at marginal welfare can give a government the wrong idea about socially optimal budget changes. A budget cut can improve welfare more than extra budgetary funds would.

An agency that is run by a head who prefers to keep a low profile ( $\phi < 0$ ), shifts discretely between tasks in a similar way, yet with less erratic effects on welfare. At low budgets, he would rather stop case handling altogether than shift to complex tasks, with further welfare detriment when the residual budget is not returned to society. Beyond that budget level, however, the welfare jumps are mostly upwards, so that budget cuts are detrimental for society. The head needs to be encouraged to take on more complex tasks to overcome his aversion to high-profile cases. In that range, landmark

25 Directive (EU) 2019/1 of the European Parliament and of the Council of December 11, 2018 to empower the competition authorities of the Member States to be more effective enforcers and to ensure the proper functioning of the internal market, Chapter III, Article 4, paragraph 2(a).

26 Communication from the Commission to the European Parliament and the Council, Ten Years of Antitrust Enforcement under Regulation 1/2003: Achievements and Future Perspectives, European Commission, Brussels, July 9, 2014, at recital 29.

27 Directive (EU) 2019/1, Chapter III, Article 5, paragraph 3.

cases generate higher welfare, so that the global welfare maximum lies at a higher budget.

Officials may draw motivations outside of their contract terms. Demonstrating high ability by taking on a difficult task may further one's career within the institution and beyond, for example, into private sector jobs. A zealous official bent on serving welfare would lean toward opening landmark cases, despite it possibly being less preferred and rewarded by the head. Since the contract terms become of limited impact, the head will have less control, the fewer resources he has at his disposal. As long as the contract terms matter somewhat, our results remain. For higher budget values, intrinsically motivated staff can partially offset a head's concern with impression management and so improve the agency's welfare yield.

If the head knows only the *ex ante* talent distribution of his agents, our qualitative findings remain. Under asymmetric information, in a setting with one difficult and one basic task the head uses the contract design to set a "cut-off value" of the draw from the official's talent distribution above which the official chooses to perform the difficult task. The official thus *ex ante* performs each task with some probability. If the budget is binding, this comes at a cost: to satisfy the incentive constraint of an official with a high talent draw, the reward for the basic task has to be set below the head's desired level. The difference increases as the discretionary budget becomes tighter, as the official with high talent draw is rewarded less and less optimally from the head's point of view. Once this cost becomes higher than the head's utility of having those officials with higher talent perform the more difficult tasks, the head stops rewarding the complex task altogether and increases the reward for the simple task. This will generate a jump in the probability of performing each task and a discontinuity in the social welfare function. Moreover, if the head gains nonzero utility from opening a big case, there will be a shift toward performing complex tasks for the lowest budget values as well.

Another ready extension is asymmetric information on the characteristics of the available tasks; their complexity and the benefits they bring to society and to the head. If the head is not an expert, a wedge may be driven between formal and real authority in the agency, similar to that in [Aghion and Tirole \(1997\)](#). The officials would have a real authority over the task pickup, whenever some level of authority delegation is optimal for the head, for example, when the costs of obtaining the relevant information is too high. If there is a difference between the private benefits of the tasks' completion of the head and those of the official, and the officials have private information about the tasks' characteristics, the effects of the agency's prioritization

with a shift in the discretionary budget assignment are ambiguous. The head is bound by the incentive constraint of the official, unless he can discover the relevant information himself—at a cost that may stop the head from rewarding them, which would amount to more abrupt shifts in welfare. Alternatively, the head may need to leave the better informed official a rent.

A more continuous set of tasks for each official to perform can smoothen the welfare function. Also, a rising number of officials makes the welfare effect of individual jumps less pronounced. Yet, by their nature, government agency tasks remain discrete and of a certain minimum size. Also, more cooperative types of enforcement, such as commitments or settlements, may reduce the amount of resources that need to be committed to concluding a case. If officials can pick up more than one task and split their effort among them, this may reduce the sizes of the welfare jumps at agency focus shift points, but it will not eliminate them. The discontinuities will become less pronounced, as each task's performance constitutes a lower share of the total expected welfare. Yet, some level of discretion to select cases will always remain, as still a settlement requires extensive case preparation.

Actual welfare and how society and the government perceive it may not be the same, and heads would be focused on the latter. In fact, impression management applies where the benefits from the control tasks of government agencies modeled are not obvious to the public. If the appearance of performance is overvalued by society, the agency contracts stimulate the take-up of too difficult tasks even more. If public regard for basic tasks is excessive, too few landmark cases will be dealt with. The jumps in perceived social welfare may smoothen, or even reverse, yet the jumps in the actual welfare remain pronounced—only they happen at different budget levels. The head has an incentive to always make society believe that the optimal budget is higher than it actually is.

The analysis suggests several directions for empirical research. It predicts that, even under stable leadership, the priorities in government agencies that have some discretion over their agendas, such as regulators and other market oversight authorities, intelligence agencies, and internal revenue services, change structurally at particular budget levels. In particular, a markedly higher (lower) level of standard tasks, combined with a drop (uptake) of more sophisticated interventions, could be found to go together with only small changes in the budget. In agencies with stricter budget-compartmentalization, this effect would be weaker. Also, with a change of directorship, our model predicts that distinctly new types of enforcement styles may come, in particular when appointees are of a different inclination, political or otherwise. A complexity

for empirical research along these lines arises from the need to classify cases as “complex” or “basic,” which in a world of rich case heterogeneity is certainly not obvious. For sufficiently acceptable categories, however, a finding of nonmonotonic task take-up would corroborate our theory.

Our model provides a base for studying how a political overseer can steer an agency’s task take-up to please their various constituencies. This is a prime research interest in the political science literature on bureaucracy control referred to in the introduction. A successful lobby by the industry of the responsible ministry, complaining that the agency would be too aggressive in finding and sanctioning companies, may lead either to budget cuts or enlargements—depending on where the agency is on the case-type spectrum. Another mechanism is to modify the head’s incentives by changing the criteria by which he is assessed. On the other hand, the head has tools to influence public opinion. Through impression management, the head can produce public support, which may translate into pressure on politicians to enlarge the agency’s budget. To study these and other mechanisms of political influence formally requires a higher-level principal–agent relationship that overarches the one we model in this paper, in which the political overseer is the principal and the agency head the agent. It can provide insight into how political overhead authorities can make private and socially optimal use of the budget-lever mechanism that we have identified. We leave this for future research.

### Supplementary material

Supplementary data are available at *Journal of Public Administration Research and Theory* online.

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