Policy Unbundling and Special Interest Politics DRAFT

Dimitri Landa* Patrick Le Bihan†

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Abstract

We study the desirability of unbundling policy areas in a simple model of political accountability with variation in complexity across policy areas. We find that bundling policy areas promotes accountability and resistance to policy capture by special interests when relative policy area complexities are sufficiently symmetric and benefits of office are sufficiently large. We also show that under those conditions, bundling policy may lead to higher total effort than unbundling. The key intuition for the relative appeal of bundling stems from the fact that under medium strong electoral incentives, it can be particularly good at encouraging effort because it promotes risky investment into outcome.

*Associate Professor, Wilf Family Department of Politics, NYU, e-mail: dimitri.landa@nyu.edu
†Research Fellow, Institute for Advanced Study in Toulouse, e-mail: patrick.lebihan@iast.fr

1 Introduction

One of the central dimensions of institutional variation across jurisdictions concerns the concentration and division of responsibility among elected officials. While in some jurisdictions, voters elect a single executive charged with administering policy across issue dimensions, in others, they elect several officials, each for a distinct policy area. The variation in *bundling* of policy areas is notable at the state and local levels in the US and is gaining prominence as an important institutional factor to be considered in constitutional design more broadly (Besley and Coate, 2003; Marshall, 2006; Berry and Gersen, 2008; Gersen, 2010).[1]

A key concern with respect to bundling policy areas is political accountability. As the burgeoning literature on accountability has made clear, different institutional environments create different incentives for voters and politicians. One may similarly expect differences to exist with respect to the variation in the extent and nature of bundling of policy areas. Yet, with few exceptions we discuss below, this relationship has received little theoretical attention. The present paper is a contribution to filling this gap.

We develop a career-concerns model of political accountability that focuses on two factors that we believe are particularly relevant for analyzing the welfare implications of (un-)bundling: complexity of policy areas and susceptibility of the policy-making process to capture by special interests. Complexities of policy-making in a given policy area may be a function of the underlying political environment: for example, how sovereign is a given policy maker in determining the policy? If she is not sovereign, does the policy-maker need to work with a politically sympathetic or unsympathetic body or bodies to advance a policy? Complexity of a policy area may also depend on the specific nature of the area: how

[1]Just to give one example, in several US states the head of the Department of Education is directly elected by the citizens instead of being appointed by the governor.

much is known about the possible range of policy consequences? Is there much institutional knowledge or prior experimentation in this policy area to minimize chance—as opposed to choice—driven consequences? Clearly, there is considerable variation in relation to these questions across policy areas, and, as complexity affects the voters' ability to monitor the incumbents and, holding fixed the electoral response, incentivize their effort choice, one should expect a variation in incumbent-specific signals that comes with the variation in (un-)bundling to affect voter welfare.

Concern with institutional and policy capture by special interests is a mainstay of the debates about political accountability. A policy influence that is disproportional and at the expense of the majority is a prima facie challenge to effective representative governance. Whether policy-making is captured depends, of course, on whether there are organized interests seeking to subvert the electoral ballot-box representation. However, conditional on the existence of such interests, their ability to capture the policy-making depends on how easy it is for the voters to resist it with electoral incentives to the office-holders. Intuitively, unbundling policy areas gives voters an opportunity to target their electoral incentives for separate policy areas separately, without a sacrifice of a captured policy area of secondary importance for getting a preferred policy in the area of primary interest. This logic is at the core of the Besley and Coate (2003) model that delivers an endorsement of unbundling as lowering susceptibility to capture by special interests.[2]

This logic is, indeed, intuitive, and it operates in our model as well. But our analysis suggests that the accountability channels fundamentally affect the voters' and incumbents' expectations in ways that go beyond this intuition. In particular, we show that the expectation of the policy capture by the interest group on a given issue dimension may have negative spillovers for the incumbent's choice on other issue dimensions, leading to a more

[2]Berry and Gersen (2008) endorse this argument as well.

global failure of policy-making under bundling.

However, we also show that the accountability channels can undercut, and, indeed, reverse the greater control intuition in favor of unbundling. A key observation that sustains this result is that lower-powered incentives for the agent may lead to higher effort because, in effect, they give the incumbent greater chance at satisfying the voters. We show that this logic provides a potent argument in favor of unbundling when the task complexity faced by the representatives is middling: not so high that the incumbent prefers never to invest into effort and not so low that the voters can easily induce him to invest in each. Perhaps more surprisingly still, we show that the presence of the interest group with preferences that are adverse to those of the voters can increase the range of circumstances under which the voters can anticipate higher performance from the incumbents. This occurs because the presence of the interest group can help "write off" the policy failures that would, otherwise, be a signal of the incumbent's low competence. In fact, because this allows the voters who are using weaker incentives under bundling, to sustain a higher effort equilibrium, their ability to update on the incumbent's competence also goes up.

If voters' retention rules have a retrospective component, as they do in the career-concerns setting, then the retention rule voters adopt can be shown to affect the price that the interests groups would have to pay for policy capture. We show that the conjunction of this effect and of the "write off" effect of interest groups may dominate the value to the voters of getting additional levers for controlling the incumbent that come with unbundling. Indeed, we show that when the cost of effort is low relative to the benefit of office, bundled policy making may be more proof against policy capture than the unbundled policy. We establish these results in a model without complementarities between tasks. The general thrust of the argument is robust to positive complementarities between tasks. For the case with negative complementarities see Hatfield and Padro i Miquel (2006).

Our baseline model is related to the model in Ashworth and Bueno de Mesquita (2014) who also study the welfare effects of policy unbundling but not the susceptibility of different institutions to corruption from special interest politics, which is our main focus below. Their game form is similar to the continuous version of our baseline model but for a key difference: the key dimension of the policy production technology they analyze is the exogenous correlation in politician competence across tasks, whereas we focus our analysis on the variation in task complexity measured by the conditional likelihood of policy success. This difference leads to fundamentally different mechanisms operating in our models, and the comparison of our results, which we discuss in Section 6 below, suggests that the two dimensions we focus on are orthogonal.

Finally, our paper is related but is quite different from the literature on multitask both in contract theory and in political economy. Other than the Besley and Coate (2003) and the Ashworth and Bueno de Mesquita (2014) papers discussed above, multi-task models in political economy settings include (Ashworth, 2005; Bueno de Mesquita, 2007; Bueno de Mesquita and Landa, 2013; Le Bihan, 2014). These models do not study the institutional comparisons that are our focus below.

2 The Model

2.1 Actors and Order of Play

We consider a simple model of a representative democracy consisting of a representative voter (V), one or two Agents (A), and an Interest Group (IG). There are two tasks, a_1, and a_2. We consider two institutions. In the first one, called *bundling*, a single Agent (denoted A) is responsible for both tasks. In the second institution, which we call *unbundling*, there

are two Agents (denoted A_1 and A_2 respectively) each responsible for one of the two tasks. On each of these two tasks the responsible Agent can choose to implement a reform or not. We denote $a_i = 0$ the choice of the Agent not to implement a reform on task $i = 1, 2$, and $a_i = 1$ the choice to implement such a reform.

The Agent can be more or less capable. Specifically, we assume that the Agent can be of one of two types $\theta \in \{\theta_L, \theta_H\}$ with $Pr(\theta = \theta_H) = \pi$. The probability of success of a reform depends on the ability of the Agent in the following way: if the Agent chooses to exert effort on task i, i.e. chooses $a_i = 1$, then the probability of success is e_i^L if the Agent is of low ability θ_L, and e_i^H if the Agent is of high ability θ_H with $0 \leq e_i^L < e_i^H \leq 1$. Further, if the Agent chooses not to exert any effort then the probability of success is 0 independently of his type. For simplicity, we adopt a career concerns framework and assume that the ability of the Agent is not observed by any of the actors *ex ante*. The distribution of types is commonly know, however. It follows that the *ex ante* probability of success of choosing $a_i = 1$ is $\pi e_i^H + (1 - \pi)e_i^L := e_i$. We think of e_i as representing the complexity of the task. The lower e_i, the less control the Agent has over success or failure on policy task i.

Before the Agent responsible for task a_1 chooses whether to implement a policy reform, the Interest Group can offer the Agent a bribe $b \geq 0$. If the Agent accepts the bribe b, he implements $a_1 = 0$. If, however, the Agent rejects the bribe he is free to choose $a_1 = 0$ or $a_1 = 1$. We thus follow Grossman and Helpman (1994) and others by modeling a contribution as an action contract with the payment conditional on a certain policy decision of the Agent. The Voter only observes the outcome of the Politician(s)'s actions. Note that these assumptions imply an asymmetry between the Voter and the Interest Group as the Interest Group observes the action a_1 chosen by the Agent, whereas the Voter does not. Upon observing the outcome(s) the Voter decides whether to retain or dismiss the Agent(s). If the Voter dismisses an Agent then the replacement is of high ability with probability π.

2.2 Payoffs

The Voter wants the reform to succeed and receives payoff $u_V(s_i) > 0$ from success on dimension i and zero from failure. The Voter receives an additional payoff of $R > 0$ for retaining an Agent of high ability θ_H. This additional payoff R entails that the Voter prefers retaining an Agent who is of high ability θ_H over retaining a low type θ_L. As a consequence, the Voter only retains the Agent, if the Voter believes, upon observing the policy outcome(s), that the Agent is of type θ_H with probability superior or equal to π.

Agents value retention. Under bundling the Agent receives an additional payoff of $B > 0$ when retained and a payoff of zero when dismissed from office. Similarly, under unbundling, each Agent A_i receives an additional payoff of B_i when retained and a payoff of zero when dismissed. We assume throughout that $B_1 + B_2 = B$. We also assume that implementing a reform requires exerting effort and is thus costly to the Agent. We let $k > 0$ be the cost to the Agent of choosing $a_i = 1$. The costs are additively separable, i.e. the Agent incurs cost $2k$ under bundling when choosing $(a_1 = 1, a_2 = 1)$. Finally, we assume that the Agent receives a utility of b when accepting the bribe.

The Interest Group has policy preferences opposed to those of the Voter and receives a payoff of $u_{IG}(f) > 0$ when the outcome on dimension a_1 is failure and a payoff of zero when it is success. Moreover, the Interest Group has disutility $-b$ when paying a bribe b to the Agent. Throughout, we assume that the Interest Group's resource constraint does not bind and study the level of the bribe that the Interest Group would have to pay to the Agent in order to get the Agent to implement $a_1 = 0$ and whether, given $u_{IG}(f)$, the Interest Group chooses to pay that bribe to the Agent. We assume that the value of failure to the Interest Group $u_{IG}(f)$ is drawn from any distribution Function $F(\cdot)$ with full support on $\mathbb{R}$.

2.3 Solution Concept

As described above, this is a career concerns model of electoral accountability. We restrict attention to pure strategy Perfect Bayesian equilibria. Before proceeding, note first that there always exists an equilibrium in which the Agent chooses $(a_1 = 0, a_2 = 0)$, and the Voter randomizes between reelecting and not relecting with any probability. When the Agent makes such a choice, the outcome, which is awlays $(s_1 = 0, s_2 = 0)$, is completely uninformative of the Agent's type, and, correspondingly, the Voter cannot update on her prior. This equilibrium persists under both bundling and unbundling and for any value of policy failure to the Interest Group.[3] As such, it is not relevant for evaluating the consequences of institutional variation. We focus our analysis on evaluating the differential effect of incentives in incentivizing the Agent choices.

3 Analysis

To understand more easily the logic of the model, we first present the analysis of a baseline environment. In this baseline, the interest group's resources are too low to afford a policy influence on either dimension[4], and the focus of our analysis is on the incentives that variation in policy complexity creates in a multi-task setting, i.e., the setting in which the Agent is responsible for both policy tasks. This baseline, thus, can be seen as a special case of our main model under bundling.

[3] It is also fragile, since the off-path events of $s_i = 1$ are informative of the Agent's type, and the sequentially rational Voter will need to update accordingly.

[4] Alternatively, the interest group does not care about the policy outcome, i.e. $u_{IG}(f) = 0$

3.1 A Baseline Model of Multi-Task

In equilibrium the Agent can choose (1) not to exert any effort, i.e. the Agent chooses $(a_1 = 0, a_2 = 0)$, (2) to exert high effort on one task but not the other, i.e. the Agent chooses $(a_i = 1, a_j = 0)$, for some $i = 1, 2$, or (3) to exert high effort on both tasks, i.e. the Agent chooses $(a_1 = 1, a_2 = 1)$. We now derive conditions under which the Agent exerts positive effort in equilibrium.

We begin with the conditions under which, in equilibrium, the Agent chooses to exert effort on only one task, say task i. Suppose, then, that, in equilibrium, the Voter expects the Agent to choose $(a_i = 1, a_j = 0)$. Then, the Voter updates his beliefs about the ability of the Agent favorably upon observing success on task i. Formally,

$$Pr(\theta = \theta_H | s_i = 1, s_j = 0) = \frac{e_i^H \pi}{e_i^H \pi + e_i^L (1 - \pi)}$$

Note that $Pr(\theta = \theta_H | s_i = 1, s_j = 0) > \pi$ given that $e_i^H > e_i^L$. Similarly, the Voter updates his beliefs about the ability of the Agent downwards upon observing failure on task i. Formally,

$$Pr(\theta = \theta_H | s_1 = 0, s_2 = 0) = \frac{(1 - e_i^H)\pi}{(1 - e_i^H)\pi + (1 - e_i^L)(1 - \pi)}$$

$Pr(\theta = \theta_H | s_1 = 0, s_2 = 0) < \pi$ given that $e_i^H > e_i^L$. Observing success on task j is off the equilibrium path in this case and the Voter can hold any belief about the type of the Agent. In particular assume that the Voter then holds beliefs such that the Voter reelects if, and only if, he observes success on task i. The Agent's expected payoff is, then, $e_i B - 2k$ when exerting effort on both tasks, $e_i B - k$ when exerting effort only on task i, and 0 otherwise. In equilibrium, the Voter's expectations about the Agent's effort choices must be correct and it must therefore be a best-response for the Agent to choose $(a_i = 1, a_j = 0)$. This is the case,

provided that $e_iB-k \geq 0$ and $e_iB-2k \leq e_iB-k$. The first inequality ensures that the Agent is better off choosing $(a_i = 1, a_j = 0)$ over $(a_i = 0, a_j = 1)$ and $(a_1 = 0, a_2 = 0)$, and the second that he has no incentive to switch to $(a_i = 1, a_j = 1)$. In fact, the second inequality holds always, since, by construction, the Agent has no incentive to choose high effort on both tasks because the Voter's reelection behavior does not condition on the outcome on task j. We, thus, have the following claim:

Observation 1. *The strategy profile under which the Agent chooses* $(a_i = 1, a_j = 0)$ *and is re-elected if, and only if, the Voter observes success on dimension* i *is consistent with equilibrium play if, and only if,* $e_iB - k \geq 0$.

Consider next the conditions under which the Agent chooses to exert effort on both tasks in equilibrium. So suppose that the Voter expects the Agent to choose $(a_1 = 1, a_2 = 1)$. Then, if the Voter observes success on both tasks he updates favorably his belief about the type of the Agent and chooses to reelect accordingly. Indeed, we have

$$Pr(\theta = \theta_H | s_1 = 1, s_2 = 1) = \frac{e_1^H e_2^H \pi}{e_1^H e_2^H \pi + e_1^L e_2^L (1-\pi)}.$$

$Pr(\theta = \theta_H | s_1 = 1, s_2 = 1) > \pi$ as $e_i^H > e_i^L$ for all $i = 1, 2$. On the other hand, if the Voter observes failure on both tasks, he updates his belief about the type of the Agent unfavorably and decides not to reelect:

$$Pr(\theta = \theta_H | s_1 = 0, s_2 = 0) = \frac{(1-e_1^H)(1-e_2^H)\pi}{(1-e_1^H)(1-e_2^H)\pi + (1-e_1^L)(1-e_2^L)(1-\pi)}.$$

$Pr(\theta = \theta_H | s_1 = 0, s_2 = 0) < \pi$ as $e_i^H > e_i^L$ for all $i = 1, 2$.

We now study how the Voter updates his belief about the Agent's ability upon observing success on one task and failure on the other. Intuitively, observing success on task i should

lead the Voter to update favorably on the ability of the Agent, while observing failure on task j should lead the Voter to update downwards. The question then is whether success on task i is a stronger signal of high ability than failure on task j is a signal for low ability.

We have:

$$Pr(\theta = \theta_H | s_i = 1, s_j = 0) = \frac{e_i^H(1 - e_j^H)\pi}{e_i^H(1 - e_j^H)\pi + e_i^L(1 - e_j^L)(1 - \pi)},$$

which is strictly greater than π if, and only if,

$$e_i^H(1 - e_j^H) > e_i^L(1 - e_j^L). \tag{1}$$

The interpretation of condition (1) is straightforward: $e_i^H(1 - e_j^H)$ is the probability that the Voter will observe $(s_i = 1, s_j = 0)$ when the Agent chooses $(a_1 = 1, a_2 = 1)$ and is of high ability, while $e_i^L(1 - e_j^L)$ is the probability that that outcome is observed given the same action choices by the Agent when the Agent is of low ability. Consequently, condition (1) says that when the Voter expects the Agent to choose $(a_1 = 1, a_2 = 1)$, she is more likely to observe $(s_i = 1, s_j = 0)$ when the Agent is of high ability than when he is of low ability.

Depending on the values of e_1^H, e_2^H, e_1^L, and e_2^L, we may, thus, have one of three cases: (1) Condition (1) fails for all $i = 1, 2$, $j \neq i$ and so the Voter updates negatively upon observing failure on any task and consequently reelects if, and only if, the Agent is successful on both tasks; (2) Condition (1) holds for $i, j \in \{1, 2\}$, and so the Voter updates favorably upon observing success on any task and consequently reelects whenever the Agent is successful on at least one task; and (3) Condition (1) holds for i but not for j, and so the Voter updates favorably upon observing success on task i and failure on task j, yet updates negatively upon observing failure on task i and success on task j, implying that the Voter reelects if, and only if, the Agent is successful on task i. We consider these cases in turn.

Case 1: the Voter reelects the Agent if, and only if, he is successful on both tasks, i.e., $r(s_i = 1, s_j = 0) = 0$ for all $i = 1, 2$, $j \neq i$. Given this reelection behavior, the Agent chooses between exerting effort on both tasks and exerting no effort at all, since exerting effort on one task is clearly dominated by exerting effort on neither. Given the case condition, when exerting effort on both tasks, the Agent is only retained when $(s_i = 1, s_j = 1)$, which happens with probability $e_1 e_2$. Exerting effort on both tasks, thus, yields an expected payoff of $e_1 e_2 B - 2k$. Consequently, if Condition (1) fails for all $i = 1, 2$, $j \neq i$ (and so it is a best-response for the Voter to reelect the Agent if, and only if, there is success on both tasks) and $e_1 e_2 B - 2k \geq 0$ (expected value to the Agent of choosing $(a_1 = 1, a_2 = 1)$ is greater than the certain value of choosing $(a_1 = 0, a_2 = 0)$), there exists an equilibrium in which the Agent is choosing to implement reform on both tasks. Thus we have the following observation:

Observation 2. *The strategy profile under which the Agent chooses* $(a_1 = 1, a_2 = 1)$ *and is re-elected if, and only if, the Voter observes success on both dimensions, is consistent with equilibrium play if, and only if, Condition (1) fails for all* $i = 1, 2$, $j \neq i$ *and* $e_i \geq \frac{2k}{e_j B}$ *for all* $i = 1, 2$.

For this equilibrium to exist the probabilities of success e_1, and e_2, need both to be relatively high. If either e_1 or e_2 is too low, then the probability of being successful on both tasks is low as well, and the Agent will be better off not exerting any effort at all.

Case 2: the Voter reelects the Agent whenever he is successful on at least one of the two tasks, i.e. $r(s_i = 1, s_j = 0) = 1$ for all $i = 1, 2$, $j \neq i$. Exerting effort on both tasks then yields the Agent an expected payoff of $(e_1 + e_2 - e_1 e_2)B - 2k$, while exerting effort only on task i yields $e_i B - k$. For the Agent to choose $(a_1 = 1, a_2 = 1)$, it must, thus, be the case that

$$U_A(a_1 = 1, a_2 = 1) \geq U_A(a_i = 1, a_j = 0),$$

i.e.,

$$(e_1 + e_2 - e_1 e_2)B - 2k \geq e_i B - k \text{ for all } i = 1, 2,\ j \neq i,$$

which is equivalent to

$$e_j(1 - e_i)B - k \geq 0 \text{ for all } i = 1, 2,\ j \neq i. \tag{2}$$

The left-hand side of condition (2) represents the additional benefit to the Agent of exerting $(a_1 = 1, a_2 = 1)$ instead of $(a_i = 1, a_j = 0)$. Intuitively, it states that for the Agent to be willing to choose to exert effort on both tasks rather than only exert effort on task i, it must be the case that the probability of being retained must be sufficiently higher when exerting effort on both tasks than when exerting effort on task i alone to justify incurring the additional cost k of exerting effort on task j. This is only the case when (1) the probability of success e_i on task i is not too high, as otherwise the Agent can be relatively sure to be retained when only exerting effort on task i, rendering investment into effort on task j superfluous and (2) the probability of success on task j is sufficiently high to justify investment into task j in the first place.

Rearranging terms in (2), we find that if the Voter retains the Agent if, and only if, he is successful on at least one task, then the Agent chooses $(a_1 = 1, a_2 = 1)$ if, and only if,

$$1 - \frac{k}{e_j B} \geq e_i \geq \frac{k}{(1 - e_j)B} \text{ for all } i = 1, 2. \tag{3}$$

Thus, we have the following observation:

Observation 3. *The strategy profile under which the Agent chooses $(a_i = 1, a_j = 1)$ and is re-elected if, and only if, the Voter observes success on either dimensions, is consistent with equilibrium play if, and only if, Conditions (1) and (3) hold for $i, j \in \{1, 2\}$.*

Thus, if we are in Case 2 condition, so that it is a best-response for the Voter to reelect the Agent if, and only if, he is successful on at least one task, then, when tasks are of intermediate complexity, in the sense that the probabilities of success e_1 and e_2 take intermediate values, the Voter promotes risky investment by the Agent in both tasks by using a somewhat lax reelection rule which essentially gives the Agent a second chance of being rewarded for success.

The lower and the upper bounds on the range of values of e_i for which the Agent chooses to exert high effort on both tasks is increasing in the probability of success e_j. Indeed, as shown above, for the Agent to choose $(a_1 = 1, a_2 = 1)$, it must be the case that $e_j(1-e_i)B - k \geq 0$, where this last expression represents the additional benefit to the Agent of exerting $(a_1 = 1, a_2 = 1)$ instead of $(a_i = 1, a_j = 0)$. So suppose the probability of success e_j increases. In such a case, the utility to the Agent of choosing $(a_i = 0, a_j = 1)$ increases and thus the marginal benefit of exerting $(a_1 = 1, a_2 = 1)$ instead of $(a_1 = 0, a_2 = 1)$, i.e. $e_i(1 - e_j)B - k$, decreases. The lowest value of e_i at which the Agent still prefers to choose $(a_1 = 1, a_2 = 1)$ over $(a_1 = 0, a_2 = 1)$, i.e. the value of e_i that solves $e_i(1 - e_j)B - k = 0$, thus needs to increase. Based on the previous discussion, it should be clear that for an equilibrium to exist in which the Agent chooses $(a_1 = 1, a_2 = 1)$ and the Voter reelects if, and only if, there is success on at least one task, the difference between the values of e_1 and e_2 cannot be too high. We will see this logic working in the broader environment with the interest group influence.

Case 3: the Voter reelects the Agent if, and only if he is successful on task i, i.e. $r(s_i = 1, s_j = \cdot) = 1$ and $r(s_i = 0, s_j = \cdot) = 0$ for all s_j. This case condition is incompatible with the requirement that the Agent chooses to exert effort on both tasks. Indeed, the expected payoff to the Agent of choosing $(a_1 = 1, a_2 = 1)$ is $e_iB - 2k$, while deviating to $(a_i = 1, a_j = 0)$ yields $e_iB - k$.

Putting together the preceding analysis yields the following:

Proposition 1. *On the equilibrium path of play in the baseline multi-task model:*

1. *The Agent chooses* $(a_i = 1, a_j = 1)$ *if, and only if, either*

   (a) $e_1 \geq \frac{2k}{e_2 B}$ *and* $e_i^H(1 - e_j^H) < e_i^L(1 - e_j^L)$ *for all* $i = 1, 2$, *in which case the Voter reelects if, and only if,* $(s_1 = 1, s_2 = 1)$ *or*

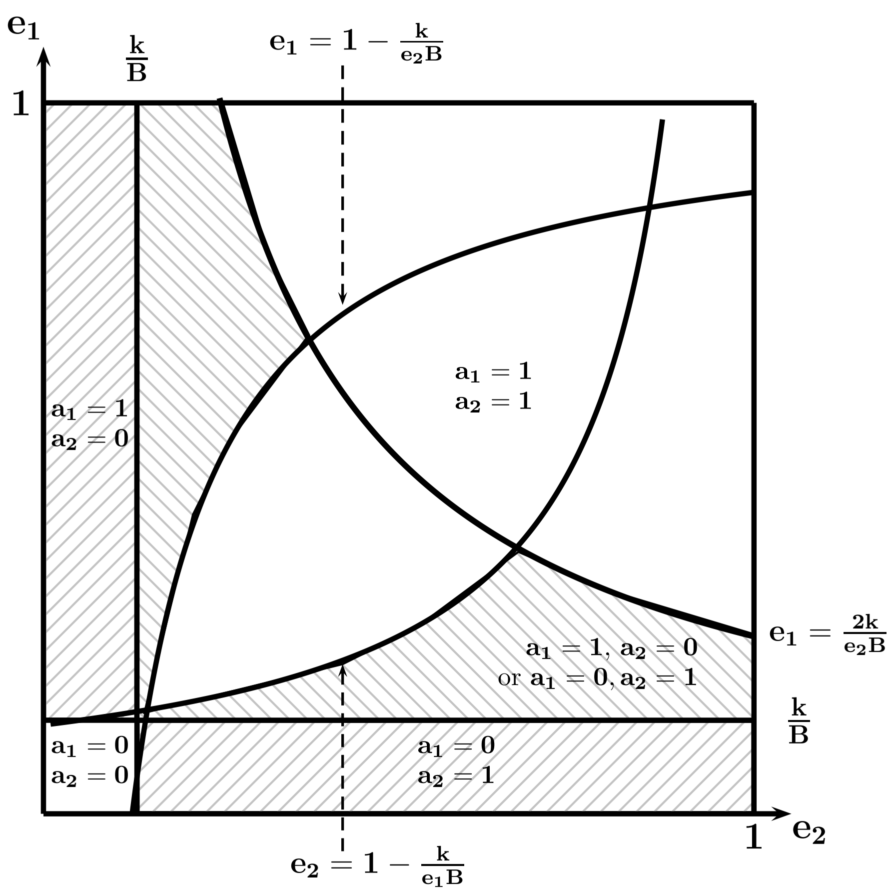
   (b) $1 - \frac{k}{e_j B} \geq e_i \geq \frac{k}{(1-e_j)B}$ *and* $e_i^H(1 - e_j^H) > e_i^L(1 - e_j^L)$ *for all* $i = 1, 2$, *in which case the Voter reelects if, and only if,* $s_i = 1$ *for at least some* $i = 1, 2$.

2. *The Agent chooses* $(a_i = 1, a_j = 0)$ *if* $e_i \geq k/B$, *and the Voter reelects if, and only if,* $s_i = 1$.

3. *The Agent chooses* $(a_1 = 0, a_2 = 0)$ *if* $e_i < k/B$ *for all* $i = 1, 2$, *and is never reelected.*

We illustrate these results in figure 1 below. This figure represents for given values of k, and B, the highest level of effort by the Agent that can be sustained in equilibrium as a function of the probabilities of success e_1, and e_2. Remember that e_1 and e_2 are compound probabilities, with $e_i := \pi e_i^H + (1 - \pi)e_i^L$. As explained above, for the equilibria in which the Agent chooses to exert high effort on both tasks, additional restrictions on e_i^H, e_i^L, $i = 1, 2$, need to be satisfied. These additional restrictions are not depicted in the figure. For any value of $(e_1, e_2) \in (0, 1)^2$, there exists an infinity of e_i^H, e_i^L, $i = 1, 2$, and π that satisfy $e_i := \pi e_i^H + (1 - \pi)e_i^L$, $i = 1, 2$, and the additional restrictions on e_i^H, e_i^L, $i = 1, 2$, necessary to sustain the equilibrium under consideration.

Figure 1: Equilibrium Behavior in the Baseline Multi-Task Model



Two aspects of this characterization are worthy of particular note. The first concerns the reelection strategies that are able too extract highest effort from the Agent. Giving the Agent strong incentives – reelecting if and only if there is success on both tasks – is effective as ensuring success when $e_i \geq \frac{2k}{e_j B}$ for all $i = 1, 2$. When this condition is violated, strong

incentives cannot encourage the Agent to choose $(a_1 = 1, a_2 = 1)$. However, when $e_i < \frac{2k}{e_j B}$ but condition (3) holds, weaker incentives – reelecting if and only if there is success on at least one task – are able to do precisely that. This happens when the complexity of tasks is sufficiently high but not too high relative to the cost (of effort)-benefit (of office) ratio: when the complexity gets sufficiently low, strong incentives become effective again, and when complexity is too high to meet (3), even these weaker incentives cannot encourage the Agent to invest. This strong power of weaker incentives is a consequence of the coarse electoral contracts that are, of course, a key difference between political economy and industrial organization settings. In the electoral setting, the reward to the Agent is the control of a public office (B). Whereas in the IO settings, the principals can write a contract that assigns different rewards to the four possible events (success on neither task, only on the first, only on the second, and success on both), electoral principals are choosing from among binary contracts that constrain their ability to fine-tune the incentives. (CITE).

The second aspect of the characterization concerns the presence of equilibrium "accountability traps" in our setting. Condition in part 2 of Proposition 2 is consistent with conditions in 1a and 1b, implying equilibrium multiplicity. The basic intuition is that when the Voter is expecting less from the Agent, the Agent may have no incentives to do more. Part 2 of the proposition refers to the circumstance in which the expectation is low: the Voter expects that the Agent will invest only in one task; facing this expectation, the Agent does exactly that. Part 1 of the proposition, on the other hand, describes the cases in which the Voter's expectations are high, and the Agent's choices meet them. In effect, the lower expectations "trap" the players in the low-accountability setting (Ashworth et al. 2014). As Dewatripont et al. (1999a and b) show, this equilibrium multiplicity is a product of a multiplicative production technology – a feature of our model – which creates strong type-action complementarities.[5]

[5] A somewhat different, though related, way of looking at it is suggested by Ashworth et al. (2014), who

3.2 Policy Bundling

We now study the equilibrium of the bundled institution in the presence of interest groups. We proceed in two steps. We first derive the best responses of the Agent and the Interest Group to reelection rules used by the Voter. We then derive the conditions under which these reelection strategies are sequentially rational given the expected behavior of the Agent and the Interest Group.

Suppose the Voter reelects the Agent if, and only if, there is policy success on both tasks. Then, upon rejecting the bribe offered by the Interest Group, the Agent chooses $(a_1 = 1, a_2 = 1)$, if, and only if, $e_1 e_2 B - 2k \geq 0$. Assuming this last condition is satisfied, the Agent will accept the bribe offer if, and only if,

$$b \geq e_1 e_2 B - 2k.$$

Upon accepting this bribe, the Agent will choose not to exert any effort, i.e. choose $(a_1 = 0, a_2 = 0)$. Indeed, once the Agent chooses not to exert effort on task 1, he is certain to be dismissed independent of the outcome on task 2. In equilibrium, then, the Interest Group chooses between the lowest bribe $\underline{b} = e_1 e_2 B - 2k$ that the Agent is willing to accept and $b = 0$. Upon offering $\underline{b}$, the Interest Group's payoff is $u_{IG}(f) - \underline{b}$, while upon offering $b = 0$, it's expected payoff is $(1 - e_1) u_{IG}(f)$. Thus, the Interest Group will offer a bribe $\underline{b}$ if, and only if,

$$u_{IG}(f) \geq e_2 B - 2k/e_1 := \tilde{u}.$$

show that if the noise density relative to the cross-product of action and type satisfies the strict MLRP, then the necessary and sufficient condition for equilibrium multiplicity is that when the voter expects the agent to take higher action, the agent's expected probability of retention is higher. While we do not make the MLRP assumption on the noise density, their necessary and sufficient condition for multiplicity also holds in our model.

We now derive the conditions under which it is sequentially rational for the Voter to reelect if, and only if, there is policy success on both tasks given that the Voter believes that the Agent and the Interest Group are best-responding to such a reelection strategy. To understand the construction of the beliefs, remember that the Voter is uncertain about the value $u_{IG}(f)$ that the Interest Group attaches to policy failure and that $u_{IG}(f)$ is drawn from a distribution function $F(\cdot)$ with full support on the real line $\mathbb{R}$. It follows that with probability $F(\tilde{u}) \in (0,1)$ the Interest Group chooses not to bribe the Agent. We thus have

$$\begin{aligned}
Pr(\theta &= \theta_H | s_1 = 1, s_2 = 1) = \frac{F(\tilde{u}) e_1^H e_2^H \pi}{F(\tilde{u}) e_1^H e_2^H \pi + F(\tilde{u}) e_1^L e_2^L \pi} \\
Pr(\theta &= \theta_H | s_1 = 0, s_2 = 0) = \frac{\left[F(\tilde{u})(1-e_1^H)(1-e_2^H) + 1 - F(\tilde{u})\right]\pi}{\left[F(\tilde{u})(1-e_1^H)(1-e_2^H) + 1 - F(\tilde{u})\right]\pi + \left[F(\tilde{u})(1-e_1^L)(1-e_2^L) + 1 - F(\tilde{u})\right](1-\pi)} \\
Pr(\theta &= \theta_H | s_i = 1, s_j = 0) = \frac{F(\tilde{u}) e_i^H (1-e_j^H)\pi}{F(\tilde{u}) e_i^H (1-e_j^H)\pi + F(\tilde{u}) e_i^L (1-e_j^L)\pi}
\end{aligned}$$

Note that $Pr(\theta = \theta_H | s_1 = 1, s_2 = 1) > \pi$ and $Pr(\theta = \theta_H | s_1 = 0, s_2 = 0) < \pi$, as $e_i^H > e_i^L$ for all $i = 1, 2$. But $Pr(\theta = \theta_H | s_i = 1, s_j = 0) < \pi$ if, and only if, Condition (1) fails, i.e., if, and only if, $e_i^H(1-e_j^H) < e_i^L(1-e_j^L)$.

Thus, we have the following result:

Observation 4. *(Equilibrium with Strong Incentives) The strategy profile under which*

1. *the Interest Group offers a bribe* $\underline{b} = e_1 e_2 B - 2k$ *if, and only if,* $u_{IG}(f) \geq e_2 B - 2k/e_1 \geq 0$;

2. *the Agent accepts the bribe if, and only if,* $b \geq e_1 e_2 B - 2k$ *and, if accepting, chooses* $(a_1 = 0, a_2 = 0)$, *and if rejecting,* $(a_1 = 1, a_2 = 1)$;

3. *the Voter reelects if, and only if,* $(s_1 = 1, s_2 = 1)$

is consistent with equilibrium play if, and only if, $e_i^H(1-e_j^H) < e_i^L(1-e_j^L)$ *for all* $i = 1, 2$, $j \neq i$ *and* $e_1e_2B - 2k \geq 0$.

One aspect of the equilibrium profile described in this observation comports with an intuitive understanding of the possibility of policy capture by an interest group. Relative to the same conditions on the parameters that were sustaining the $(a_1 = 1, a_2 = 1)$ Agent choices under the strong electoral incentives in the baseline environment, the presence of the effective Interest Group reduces the Agent's effort on the task that it seeks to capture (task 1). However, there is another aspect of this profile as well, the effort reduction on task 1 has a spillover effect for task 2 as well: under the strong incentives, if task 1 is captured, the Agent will not invest in task 2. The effect then, is still lower effort, as well as the decrease in the expectation of updating on the Agent's type.

We next characterize the equilibria in which the Voter uses weaker incentives. Suppose the Voter reelects the Agent if, and only if, there is policy success on at least one task and assume that $e_i(1 - e_j)B - k \geq 0$ for all $i = 1, 2, j \neq i$. Following the analysis in the previous section, these conditions imply that the Agent is best off choosing $(a_1 = 1, a_2 = 1)$, upon rejecting the bribe offered by the Interest Group. Upon accepting the bribe the Agent has to choose between $(a_1 = 0, a_2 = 0)$ and $(a_1 = 0, a_2 = 1)$. As the Voter reelects upon observing $(s_1 = 0, s_2 = 1)$, choosing $(a_1 = 0, a_2 = 1)$ yields an expected payoff of $e_2B - k$. As the Voter does not reelect upon observing failure on both tasks, choosing $(a_1 = 0, a_2 = 0)$ yields a payoff of 0. By assumption we have $e_2(1 - e_1)B - k \geq 0$, which implies $e_2B - k > 0$. Hence, the Agent chooses $(a_1 = 0, a_2 = 1)$ upon accepting the bribe.

Choosing $(a_1 = 1, a_2 = 1)$ over $(a_1 = 0, a_2 = 1)$ yields the Agent an additional expected payoff of $e_1(1 - e_2)B - k \geq 0$. Hence, the Agent accepts the bribe if, and only if, the bribe

compensates the Agent for this additional expected payoff, i.e. if, and only if,

$$b \geq e_1(1-e_2)B - k.$$

In equilibrium, then, the Interest Group chooses between the lowest bribe $\underline{\underline{b}} = e_1(1-e_2)B-k$ that the Agent is willing to accept and $b=0$. Upon offering $\underline{\underline{b}}$, the Interest Group's payoff is $u_{IG}(f) - \underline{\underline{b}}$, while upon offering $b=0$, it's expected payoff is $(1-e_1)u_{IG}(f)$. Thus, the Interest Group will offer a bribe $\underline{\underline{b}}$ if, and only if,

$$u_{IG}(f) \geq (1-e_2)B - k/e_1 := \check{u}.$$

We now derive the conditions under which it is sequentially rational for the Voter to reelect if, and only if, there is policy success on at least one task given that the Voter believes that the Agent and the Interest Group are best-responding to such a reelection strategy. To understand the construction of the beliefs, remember that the Voter is uncertain about the value $u_{IG}(f)$ that the Interest Group attaches to policy failure and that $u_{IG}(f)$ is drawn from a distribution function $F(\cdot)$ with full support on the real line $\mathbb{R}$. It follows that with probability $F(\check{u}) \in (0,1)$ the Interest Group chooses not to bribe the Agent and the Agent chooses $(a_1 = 1, a_2 = 1)$, while with probability $(1 - F(\check{u}))$ the Interest Group bribes the Agent which then chooses $(a_1 = 0, a_2 = 1)$. We thus have

$$
\begin{aligned}
Pr(\theta &= \theta_H|s_1 = 1, s_2 = 1) = \frac{F(\check{u})e_1^H e_2^H \pi}{F(\check{u})e_1^H e_2^H \pi + F(\check{u})e_1^L e_2^L \pi} \\
Pr(\theta &= \theta_H|s_1 = 0, s_2 = 0) \\
&= \frac{\left[F(\check{u})(1-e_1^H)(1-e_2^H) + (1-F(\check{u}))(1-e_2^H)\right]\pi}{\left[F(\check{u})(1-e_1^H)(1-e_2^H) + (1-F(\check{u}))(1-e_2^H)\right]\pi + \left[F(\check{u})(1-e_1^L)(1-e_2^L) + (1-F(\check{u}))(1-e_2^L)\right](1-\pi)} \\
Pr(\theta &= \theta_H|s_1 = 1, s_2 = 0) = \frac{F(\check{u})e_1^H(1-e_2^H)\pi}{F(\check{u})e_1^H(1-e_2^H)\pi + F(\check{u})e_1^L(1-e_2^L)\pi} \\
Pr(\theta &= \theta_H|s_1 = 0, s_2 = 1) \\
&= \frac{\left[F(\check{u})(1-e_1^H)e_2^H + (1-F(\check{u}))e_2^H\right]\pi}{\left[F(\check{u})(1-e_1^H)e_2^H + (1-F(\check{u}))e_2^H\right]\pi + \left[F(\check{u})(1-e_1^L)e_2^L + (1-F(\check{u}))e_2^L\right](1-\pi)}
\end{aligned}
$$

Note that $Pr(\theta = \theta_H|s_1 = 1, s_2 = 1) > \pi$ and $Pr(\theta = \theta_H|s_1 = 0, s_2 = 0) < \pi$, as $e_i^H > e_i^L$ for all $i = 1, 2$. But $Pr(\theta = \theta_H|s_1 = 1, s_2 = 0) > \pi$ if, and only if, Condition (1) holds, i.e., if, and only if, $e_1^H(1-e_2^H) > e_1^L(1-e_2^L)$, while $Pr(\theta = \theta_H|s_1 = 0, s_2 = 1) > \pi$ if, and only if, $e_2^H(1-e_1^H F(\check{u})) > e_1^L(1-e_2^L F(\check{u}))$. This last condition is significantly different from the corresponding condition, namely $e_2^H(1-e_1^H) > e_1^L(1-e_2^L)$, in the baseline model. Let $S := \{\mathbf{e} := (e_1^H, e_1^L, e_2^H, e_2^L) \in (0,1)^4 : e_2^H(1-e_1^H) < e_2^L(1-e_1^L)\}$. S represents the set of vectors $(e_1^H, e_1^L, e_2^H, e_2^L)$ such that, if the Voter expects the Agent to choose $(a_1 = 1, a_2 = 1)$, the Voter would not reelect the Agent upon observing failure on task 1 and success on task 2. Indeed, if the Voter expects the Agent to choose $(a_1 = 1, a_2 = 1)$ then failure on task 1 is a signal of low ability of the Agent whereas success on task 2 is a signal of high ability. If failure on task 1 is a stronger signal of low ability than success on task 2 is a signal of high ability, i.e. when $e_2^H(1-e_1^H) < e_1^L(1-e_2^L)$, then the Voter should not reelect. For any $\mathbf{e} \in S$, there exists a probability of bribery $1-F(\check{u}) \in (0,1)$, such that $e_2^H(1-e_1^H F(\check{u})) > e_1^L(1-e_2^L F(\check{u}))$, i.e. such that the Voter reelects upon observing failure on task 1 and success on task 2. The reason is as follows. If the Voter expects the Agent to choose $(a_1 = 0, a_2 = 1)$, then observing failure on task 1 does not convey any information about the type of the Agent, whereas observing

success on task 2 is a signal of high ability. Consequently, if the Voter expects the Agent to choose $(a_1 = 0, a_2 = 1)$, the Voter updates positively upon observing $(s_1 = 0, s_2 = 1)$ and should reelect. The presence of the Interest Group creates uncertainty on part of the Voter on which actions the Agent has chosen. The Voter expects the Agent to choose $(a_1 = 1, a_2 = 1)$ when not bribed, which occurs with probability $F(\breve{u})$, and $(a_1 = 0, a_2 = 1)$ when bribed, which happens with probability $1 - F(\breve{u})$. The possibility that the Agent has been bribed, and chooses $(a_1 = 0, a_2 = 1)$ leads the Voter to update more favorably on the type of the Agent upon observing $(s_1 = 0, s_2 = 1)$. For sufficiently high probability $1 - F(\breve{u})$ the Voter will believe that the Agent is more likely to be of high ability than a replacement and will therefore choose to reelect.

Thus, we have the following result:

Observation 5. *(Equilibrium with Moderate Incentives) The strategy profile under which*

1. *the Interest Group offers a bribe* $b = e_1(1 - e_2)B - k$ *if, and only if,* $u_{IG}(f) \geq (1 - e_2)B - k/e_1 \geq 0$;
2. *the Agent accepts the bribe if, and only if,* $b \geq e_1(1-e_2)B-k$ *and, if accepting, chooses* $(a_1 = 0, a_2 = 1)$, *and if rejecting,* $(a_1 = 1, a_2 = 1)$;
3. *the Voter reelects if, and only if, there is success on at least one task*

is consistent with equilibrium play if, and only if, $e_i(1 - e_j)B - k \geq 0$ *for all* $i = 1, 2$, $j \neq i$, $e_1^H(1 - e_2^H) > e_1^L(1 - e_2^L)$, *and* $e_2^H(1 - e_1^H F(\breve{u})) > e_2^L(1 - e_1^L F(\breve{u}))$.

The equilibrium behavior under the moderate incentives suggests two implications that push in opposite directions. First, and similar to the Interest Group's effect under the strong incentives, the presence of the interest group can lead to a policy (task) capture,

and, in so doing, lower the Voter's welfare. Indeed, under moderate incentives, the Interest Group reduces the ranges of values (e_1, e_2, k, B) under which the equilibrium effort profile of $(a_1 = 1, a_2 = 1)$ can be sustained. Note, though, that with the moderate incentives, there is no negative spillover effect with respect to task 2: holding fixed the equilibrium size of the bribe, the downside of the Interest Group is, thus, lower than under the strong incentives. (The equilibrium size of the bribe under the strong incentives may be higher or lower than under the moderate incentives.)

But the second implication points to the positive, rather than the negative effect of the Interest Group's presence. This can be seen from the comparison of Observation 5 to Part 1(b) of Proposition 2. The presence of interest group on task 1 increases ranges of parameter values e_i^H, e_i^L, $i = 1, 2$, under which $(a_1 = 1, a_2 = 1)$ equilibrium can be sustained. Hence, there exists a non-empty set $S' = \{(e_1^H, e_1^L, e_2^H, e_2^L, k, B, u_{IG}(f), F(\check{u})) \ : \ (1) \ e_1^H(1 - e_2^H) > e_1^L(1 - e_2^L), \ (2) \ e_2^H(1 - e_1^H) < e_2^L(1 - e_1^L), \ (3) \ e_2^H(1 - e_1^H F(\check{u})) > e_2^L(1 - e_1^L F(\check{u})), \text{ and } (4) \ 1 - \frac{k}{e_2 B} \geq e_i \geq \frac{k}{(1-e_2)B - u_{IG}(f)}\}$, such that without the Interest Group, the best the Voter can hope for is $(a_1 = 1, a_2 = 0)$ or $(a_1 = 0, a_2 = 1)$ equilibria but with the Interest Group – by assumption, primitively adverse to the Voter's interests – we can sustain the equilibrium in which the Agent may choose $(a_1 = 1, a_2 = 1)$ instead. Indeed, when the vector of primitives is in S', the presence of the Interest Group (weakly) improves both the expected effort from the Agent and the Voter's learning about the Agent's type. This improvement comes from the fact that the presence of the Interest Group blurs the Voter's expectations about the Agent's effort choices and thus leads the Voter to reelect upon observing $(s_1 = 0, s_2 = 1)$.

Our next two results characterize the equilibrium play under targeted incentives – when the Voter is conditioning on success with respect to a specific single task. When that task is the one that the Interest Group seeks to capture, the outcome is, naturally, determined by the strength of its appeal to the Interest Group. To capture this task, the Interest Group's

bribe must be higher than under the moderate incentives, thus promoting the electoral accountability with respect to that task, but the effort on the second task is guaranteed to be 0, lowering the Voter's welfare. When the electoral incentives target task 2, no bribing occur in equilibrium – the Interest Group gets its preferred policy for free – and the Agent invests effort into task 2 with certainty.

Observation 6. *(Equilibrium with Targeted Incentives I) The strategy profile under which*

1. *the Interest Group offers a bribe* $b = e_1 B - k$ *if, and only if,* $u_{IG}(f) \geq B - k/e_1 \geq 0$;
2. *the Agent accepts the bribe if, and only if,* $b \geq e_1 B - k$, *and, if accepting, chooses* $(a_1 = 0, a_2 = 0)$, *and, if rejecting,* $(a_1 = 1, a_2 = 0)$;
3. *the Voter reelects if, and only if, he observes success on task 1*

is consistent with equilibrium play if, and only if, $e_1 B - k \geq 0$.

Observation 7. *(Equilibrium with Targeted Incentives II) The strategy profile under which*

1. *the Interest Group offers a bribe* $b = 0$;
2. *the Agent rejects the bribe and chooses* $(a_1 = 0, a_2 = 1)$;
3. *the Voter reelects if, and only if, he observes success on task 2*

is consistent with equilibrium play if, and only if, $e_2 B - k \geq 0$.

Putting together the preceding analysis yields the following characterization:

Proposition 2. *On the equilibrium path of play:*

1. *The Agent chooses* $(a_1 = 1, a_2 = 1)$ *if, and only if, either*

   (a) $e_1 \geq \frac{2k}{e_2 B - u_{IG}(f)}$ *and* $e_i^H(1 - e_j^H) < e_i^L(1 - e_j^L)$ *for all* $i = 1, 2$, *in which case the Voter reelects if, and only if,* $(s_1 = 1, s_2 = 1)$ *or*

   (b) $1 - \frac{k}{e_2 B} \geq e_i \geq \frac{k}{(1-e_2)B - u_{IG}(f)}$, $e_1^H(1 - e_2^H) > e_1^L(1 - e_2^L)$, *and* $e_2^H(1 - e_1^H F(\check{u})) > e_2^L(1 - e_1^L F(\check{u}))$, *in which case the Voter reelects if, and only if,* $s_i = 1$ *for at least some* $i = 1, 2$.

2. *The Agent chooses* $(a_1 = 1, a_2 = 0)$ *if* $e_1 \geq k/(B - u_{IG}(f))$, *and the Voter reelects if, and only if,* $s_1 = 1$.

3. *The Agent chooses* $(a_1 = 0, a_2 = 1)$ *if* $e_2 > k/B$, *and the Voter reelects if* $s_2 = 1$.

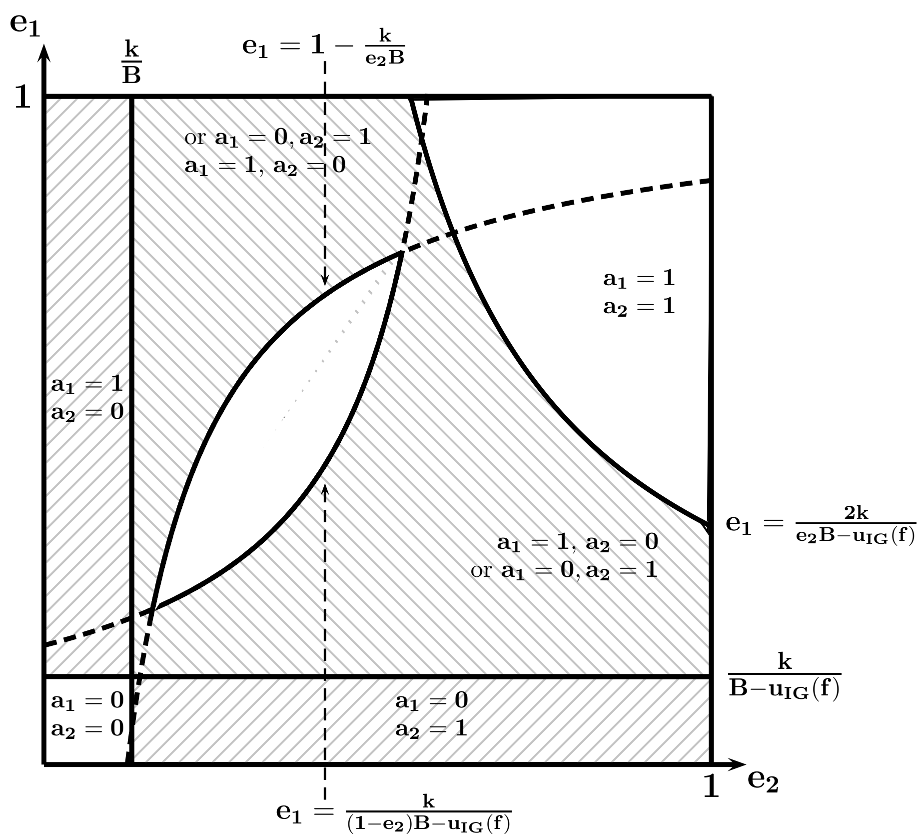
4. *The Agent chooses* $(a_1 = 0, a_2 = 0)$ *if*

   (a) $e_1 < k/(B - u_{IG}(f))$, *and* $e_2 < k/B$ *and is never reelected, or*

   (b) $e_1 < \frac{2k}{e_2 B - u_{IG}(f)}$ *and* $e_i^H(1 - e_j^H) < e_i^L(1 - e_j^L)$ *for all* $i = 1, 2$, *in which case the Voter reelects if, and only if,* $(s_1 = 1, s_2 = 1)$.

We illustrate these results in figure 2 below. This figure represents for given values of k, B, and $u_{IG}(f)$, the highest level of effort by the Agent that can be sustained in equilibrium as a function of the probabilities of success e_1, and e_2. Remember that e_1 and e_2 are compound probabilities, with $e_i := \pi e_i^H + (1 - \pi)e_i^L$. As explained above, for the equilibria in which the Agent chooses to exert high effort on both tasks, additional restrictions on e_i^H, e_i^L, $i = 1, 2$, not depicted in the figure need to be satisfied. For any value of $(e_1, e_2) \in (0, 1)^2$, there exists an infinity of e_i^H, e_i^L, $i = 1, 2$, and π that satisfy $e_i := \pi e_i^H + (1 - \pi)e_i^L$, $i = 1, 2$, and the additional restrictions on e_i^H, e_i^L, $i = 1, 2$, necessary to sustain the equilibrium under consideration.

Figure 2: Equilibrium Behavior Under Bundling



As expected, the set of values (e_1, e_2) for which a positive effort equilibrium can be sustained is increasing in the value of holding office B and decreasing in the cost of effort k, and in the value of failure to the Interest Group $u_{IG}(f)$.

3.3 Policy Unbundling

In this section we solve for the equilibrium under unbundling. Suppose the Voter reelects the Agent if, and only if he observes success. Then, in the case of Agent A_2, who does not interact with an interest group, this implies that if the Agent chooses to exert effort ($a_2 = 1$) he receives an expected payoff of $e_2 B_2 - k$. If on the other hand, he chooses not to exert effort, he receives a payoff of 0. It follows that the Agent A_2 chooses to exert effort in equilibrium only if, $e_2 B_2 - k \geq 0$. In turn, if the Voter expects the Agent to exert effort $a_2 = 1$, then the Voter believes the Agent to be of high type upon observing policy success with probability $Pr(\theta = \theta_H | s_2 = 1) = \frac{e_2^H \pi}{e_2^H \pi + e_2^L (1-\pi)} > \pi$ as $e_2^H > e_2^L$. Moreover, we have $Pr(\theta = \theta_H | s_2 = 0) = \frac{(1-e_2^H)\pi}{(1-e_2^H)\pi + (1-e_2^L)(1-\pi)} < \pi$ as $e_2^H > e_2^L$. As a consequence, it is a best-response for the Voter to reelect the Agent if, and only if, the policy outcome is success. Summarizing:

Observation 8. *The strategy profile under which the Agent A_2 chooses $a_2 = 1$ and is re-elected if, and only if, the Voter observes success on dimension 2 is consistent with equilibrium play if, and only if $e_2 B_2 - k \geq 0$.*

If the Voter reelects if, and only if, he observes success, then, if the Agent A_1 refuses the bribe of the Interest Group and chooses to exert effort, i.e. chooses $a_1 = 1$, he receives an expected payoff of $e_1 B_1 - k$. If $e_1 B_1 - k < 0$, Agent A_1 will thus choose not to exert effort independently of the behavior of the Interest Group. To make the problem non-trivial let us thus assume that upon rejecting the bribe the Agent prefers exerting effort, i.e. $e_1 B - k \geq 0$. In this case the Agent A_1 refuses any bribe $b < e_1 B - k$ and accepts a bribe $b \geq e_1 B_1 - k$. The Interest Group in turn chooses between the lowest bribe that the Agent is willing to accept, i.e. $b_u = e_1 B_1 - k$, and $b = 0$. If the Interest Group offers b_u, the Agent accepts the bribe and chooses $a_1 = 0$. Hence, the payoff to the Interest Group of offering b_u is $u_{IG}(f) - b_u$, whereas

if the Interest Group offers $b = 0$, it receives a payoff of $(1 - e_1)u_{IG}(f)$. Thus, the Interest Group offers $b_u = e_1 B_1 - k$ when the value to the Interest Group of failure is sufficiently high, $u_{IG}(f) \geq B_1 - k/e_1 := u_u$, and $b = 0$ otherwise.

We now derive the conditions under which it is sequentially rational for the Voter to reelect if, and only if, there is policy success on task 1 given that the Voter believes that the Agent and the Interest Group are best-responding to such a reelection strategy. We have:

$$Pr(\theta = \theta_H | s_1 = 1) = \frac{F(u_u)e_1^H \pi}{F(u_u)e_1^H \pi + F(u_u)e_1^L(1-\pi)} > \pi$$

and

$$Pr(\theta = \theta_H | s_1 = 0) = \frac{\left[F(u_u)(1-e_1^H) + (1 - F(u_u))\right]\pi}{\left[F(u_u)(1-e_1^H) + (1 - F(u_u))\right]\pi + \left[F(u_u)(1-e_1^L) + (1 - F(u_u))\right](1-\pi)} < \pi$$

as $e_1^H > e_1^L$. Summarizing:

Observation 9. *The strategy profile under which*

1. *the Interest Group offers a bribe $b = e_1 B_1 - k$ if, and only if, $u_{IG}(f) \geq B_1 - k/e_1 \geq 0$;*
2. *the Agent accepts the bribe if, and only if, $b \geq e_1 B_1 - k$, and chooses $a_1 = 0$ if accepting and $a_1 = 1$ if rejecting;*
3. *the Voter reelects if, and only if, $s_1 = 1$.*

is consistent with equilibrium play if, and only if, $e_1 B_1 - k \geq 0$.

From Proposition 8 we can infer that the Agent A_2 will choose $a_2 = 1$ only if, $e_2 \geq k/B_2$, whereas Proposition 9 implies that Agent A_1 will choose $a_1 = 1$ only if, $e_1 \geq k/(B_1 - u_{IG}(f))$.

In terms of the total effort that the Voter can expect under unbundling we thus have the following result:

Proposition 3. *Suppose there is an Interest Group on policy dimension a_1 that can bribe the Agent A_1. Under unbundling, in the equilibrium that maximizes Voter welfare,*

1. *if $e_1 \geq k/(B_1 - u_{IG}(f))$, and $e_2 \geq k/B_2$, then both Agents exert effort, i.e. $(a_1 = 1, a_2 = 1)$,*

2. *if $e_1 \geq k/(B_1 - u_{IG}(f))$, and $e_2 < k/B_2$, then Agent A_1 exerts effort $a_1 = 1$, while Agent A_2 does not, i.e. $a_2 = 0$.*

3. *if $e_1 < k/(B_1 - u_{IG}(f))$, and $e_2 \geq k/B_2$, then Agent A_1 does not exert effort, i.e. $a_1 = 0$, while Agent A_2 does, i.e. $a_2 = 1$.*

4. *if $e_1 < k/(B_1 - u_{IG}(f))$, and $e_2 < k/B_2$, then neither of the Agents exerts effort, i.e. $(a_1 = 0, a_2 = 0)$.*

The comparative statics are intuitive and as expected. On both tasks, the effort exerted by the Agent (weakly) increases in the probability of success e_i and the value of holding office B_i. Moreover, the effort exerted by the Agent on task a_1 decreases as the value $u_{IG}(f)$ that the Interest Group assigns to the outcome $s_1 = 0$ increases.

3.4 Comparing Institutions

We now study under what institution the Voter is able to induce the Agent(s) to choose higher levels of effort in the presence of the interest group. While in the characterization of the equilibrium behavior under unbundling, we took (B_1, B_2) to be fixed, here we will allow

for the possibility that (B_1, B_2) may be set in such a way as to maximize the equilibrium Voter welfare. Recall that we impose no restriction on B_1 and B_2 except $B_1 + B_2 = B$.

We start by comparing the conditions under which the Agent(s) choose $(a_1 = 1, a_2 = 0)$ or $(a_1 = 0, a_2 = 1)$ in equilibrium. Under bundling, there exists an equilibrium in which the Agent chooses $(a_1 = 1, a_2 = 0)$ whenever $e_1 \geq \frac{k}{B - u_{IG}(f)}$, whereas under unbundling Agent A_1 chooses $a_1 = 1$ whenever $e_1 \geq \frac{k}{B_1 - u_{IG}(f)}$. Thus, while there exist parameter values $e_1, u_{IG}(f), k, B$, and B_1 such that the Agent chooses $a_1 = 1$ under bundling but not under unbundling, it is also true that for all $e_1, u_{IG}(f), k, B$, such that the Agent chooses $a_1 = 1$ under bundling, there exists a feasible pair (B_1, B_2) such that the Agent A_1 chooses $a_1 = 1$ under unbundling. A similar statement holds with respect to $a_2 = 1$.

The more interesting, and less straightforward, question concerns the ability to sustain investment into effort by the Agent(s) such that $(a_1 = 1, a_2 = 1)$ is implemented. As we now show, there are parameter values such that $(a_1 = 1, a_2 = 1)$ could be sustained under bundling, but not under unbundling, and vice versa, suggesting distinct underlying mechanisms and rich incentive dynamics in the relationship between the Voter and the Agent. To account for these mechanisms and the conditions under which one institution is better than the other at promoting investment into effort on both tasks, we proceed in a series of steps.

First, the institutional comparison highlights the way in which our model captures the standard intuition in favor of unbundling. As Besley and Coate (2003) have argued, under bundling, an elected official can behave in favor of special interests on some policy dimensions, yet still win reelection if he is making up for this bad behavior through good performance on other dimensions. In contrast, under unbundling, each Agent has to perform well on his respective policy dimension and cannot placate voters with good performance

on other dimensions. Unbundling, therefore, can improve decision-making and resistance to capture by special interests. This logic operates in our model as well. Indeed, there is a range of parameter values for which under bundling, the highest effort equilibrium has the Agent choose $(a_i = 1, a_j = 0)$ for some $i = 1, 2$, with the Voter reelecting the Agent whenever there is success on task i, despite the fact that the Voter understands that the Agent shirked on task j, including for the reasons of being captured by the Interest Group, while the unbundling of policy tasks into separate elected offices can induce the Agents to exert effort on both tasks $(a_1 = 1, a_2 = 1)$, instead of just one. This is the logic of part 2a of the proposition below.

Second, our model suggests a distinct further reason why it may be beneficial to unbundle policy tasks. As we showed above, when the electoral incentives are strong, in the sense that the Voter reelects the Agent if, and only if, there is success on both policy tasks, the bribery of the Agent by the Interest Group may actually result in the Agent shirking on all dimensions and choosing $(a_1 = 0, a_2 = 0)$. This negative spillover effect of the presence of the Interest Group on other policy dimensions stems from the high expectations that the Voter has about the Agent's behavior. (Indeed, if the Voter expects the Agent to only exert effort on task 2, the Voter will also reelect the Agent upon observing success on task 2, which would break this negative spillover effect.) It is because the Voter expects the Agent to exert effort on both tasks that the Voter reelects the Agent if, and only if, there is success on both tasks.

Besides generating this negative spillover effect, such high expectations also have the consequence of somewhat lowering the bribe that the Interest Group needs to pay to the Agent to prevent effort on task 1. Indeed, if the Voter reelects the Agent if, and only if, there is success on both tasks, the Agent has to work on both tasks and be rather lucky on both tasks to gain reelection. In other words, under strong electoral incentives, the

reelection prospects of the Agent are not particularly favorable. Consequently, the Interest Group only needs to pay the Agent $e_1e_2B - 2k$ to prevent the Agent not to exert any effort on task 1. If the Voter was expecting less of the Agent, reelecting whenever the Agent is successful on task 1, the bribe would increase to $e_1B - k > e_1e_2B - 2k$. Under unbundling, the Interest Group needs to pay the Agent a bribe of $e_1B_1 - k$, which, while (weakly) lower than $e_1B - k$, can be higher than $e_1e_2B - 2k$. These two effects of strong electoral incentives – the negative spillover effect and the relative reduction of the level of the bribe – have two consequences. First, for all parameter values such that the Agent chooses high effort on both tasks under bundling and strong incentives, there exists a feasible pair (B_1, B_2) such that the Agents choose $(a_1 = 1, a_2 = 1)$ under unbundling. This is part 1 of the proposition below. Moreover, there exist parameter values under which the Voter has high expectations but, given the realization of the Interest Group preferences, ends up with the Agent choosing no effort on any task $(a_1 = 0, a_2 = 0)$ under bundling, whereas the Voter would receive $(a_1 = 1, a_2 = 1)$ under unbundling. This is part 2b of the proposition below.

Proposition 4. *1. Suppose $e_i^H(1 - e_j^H) < e_i^L(1 - e_j^L)$ for all $i = 1, 2$, $j \neq i$. Then, for all $(e_1, e_2, u_{IG}(f), k, B)$ such that there exists an equilibrium in which the Agent chooses $(a_1 = 1, a_2 = 1)$ under bundling, there exists a feasible pair (B_1, B_2) such that the Agents choose $(a_1 = 1, a_2 = 1)$ under unbundling.*

2. Further, if

(a) $e_1 \geq \frac{e_2k}{e_2(B-u_{IG}(f))-k}$ and either

i. $e_1^H(1 - e_2^H) < e_1^L(1 - e_1^L)$ and $e_2^H(1 - e_1^H) > e_2^L(1 - e_1^L)$ or

ii. $e_1^H(1 - e_2^H) > e_1^L(1 - e_1^L)$ and $e_2^H(1 - e_1^H F(\tilde{u}) > e_2^L(1 - e_1^L F(\tilde{u}))$,

(b) or $\frac{2k}{e_2B-u_{IG}(f)} > e_1 \geq \frac{e_2k}{e_2(B-u_{IG}(f))-k}$ and $e_i^H(1 - e_j^H) < e_i^L(1 - e_j^L)$ for all $i = 1, 2$, $j \neq i$,

then there is no equilibrium under bundling in which the Agent chooses $(a_1 = 1, a_2 = 1)$ *yet there exists a feasible pair* (B_1, B_2) *such that the Agents choose* $(a_1 = 1, a_2 = 1)$ *under unbundling.*

Third, our analysis also shows that, under moderate incentives, the standard intuition in favor of unbundling can be reversed. Indeed, when the probability of success on either task is relatively low, the respective benefits B_i of holding office need to be quite high on each task to sustain an equilibrium in which both Agents are choosing $a_i = 1$ under unbundling. When the Voter reelects the Agent whenever he is successful on at least one task, the probability that the Agent is retained under bundling, upon choosing $(a_1 = 1, a_2 = 1)$, increases to $e_1 + e_2 - e_1 e_2$ which is greater than the probability e_i of being retained for Agent A_i under unbundling. As a consequence, the Agent is willing to exert effort on both tasks, even for values of holding office B that are not sufficiently high to find an allocation (B_1, B_2), that would induce the Agents to choose $(a_1 = 1, a_2 = 1)$ under unbundling. This logic carries over even in the presence of the interest Group. Under bundling, with moderate incentives, the interest Group needs to pay the Agent $e_1(1 - e_2)B - k$ to guarantee failure on task 1, while under unbundling, the level of the bribe is $e_1 B_1 - k$. Depending on the value of B_1, the bribe may be higher or lower under bundling than under unbundling. Remember that to induce Agent A_2 to choose $a_2 = 1$ under unbundling, the value of holding office B_2 needs to satisfy $e_2 B_2 - k \geq 0$, and thus $B_2 \geq k/e_2$. Thus, the allocation of holding offices most likely to induce the Agents to choose $(a_1 = 1, a_2 = 1)$ under unbundling is $(B_1 = B - B_2, B_2 = k/e_2)$. If the probability of success is relatively low on both tasks the benefit of holding office B_2 needs to be quite high to induce Agent A_2 to choose $a_2 = 1$. Consequently, the value of holding office B_1 will be relatively low. In particular, there are values of e_1 and e_2 such that, even in the optimal allocation of (B_1, B_2), the level of the bribe is higher under bundling than under unbundling. In other words, when the consequences of decision-making are relatively

uncertain on both dimensions, moderate incentives, by giving the Agent a second chance at being retained under bundling, promotes investment on both tasks and may provide a stronger protection against the influence of interest groups than the unbundling of policy tasks.

Proposition 5. *Suppose* $e_1^H(1-e_2^H) > e_1^L(1-e_2^L)$, $e_2^H(1-e_1^H F(\tilde{u}) > e_2^L(1-e_1^L F(\tilde{u}))$. *Then,*

1. *if*

   (a) $e_1 \geq \max\{\frac{e_2 k}{e_2(B-u_{IG}(f))-k}, 1-\frac{k}{e_2 B}\}$, *or*

   (b) $\frac{k}{(1-e_2)B-u_{IG}(f)} > e_1 \geq \frac{e_2 k}{e_2(B-u_{IG}(f))-k}$,

   there exists no equilibrium under bundling in which the Agent chooses $(a_1 = 1, a_2 = 1)$ *yet there exists an allocation* (B_1, B_2) *such that the Agents choose* $(a_1 = 1, a_2 = 1)$ *under unbundling.*

2. *if* $\min\{\frac{e_2 k}{e_2(B-u_{IG}(f))-k}, 1-\frac{k}{e_2 B}\} \geq e_1 \geq \frac{k}{(1-e_2)B-u_{IG}(f)}$ *there is an equilibrium under bundling in which the Agent chooses* $(a_1 = 1, a_2 = 1)$ *yet there does not exist an allocation* (B_1, B_2) *such that the Agents choose* $(a_1 = 1, a_2 = 1)$ *under unbundling.*

Fourth, recall that in the section on bundling we showed that the presence of the Interest Group may, under moderate incentives, increase the effort allocation of the Agent from $(a_i = 1, a_j = 0)$, $i = 1, 2$, to $(a_1 = 1, a_2 = 1)$. An implication of this fact when comparing bundling to unbundling is that the presence of the interest Group may actually alter, even reverse, the comparison between the two institutions in favor of bundling. Indeed, there exist parameter values for which, without the interest Group, the Agents choose $(a_1 = 1, a_2 = 1)$ under unbundling, yet under bundling the Agent never chooses $(a_1 = 1, a_2 = 1)$. For a subset of these parameter values, with the interest Group, the optimal allocation $(a_1 = 1, a_2 = 1)$ is chosen under both institutions. More surprisingly, it is even the case that, for another

subset of these parameter values, the presence of the interest Group makes a high effort allocation ($a_1 = 1, a_2 = 1$) sustainable in equilibrium under bundling but unsustainable under unbundling. For these parameter values, whereas unbundling outperformed bundling in the absence of the interest Group, the exact opposite is true with the interest Group.

4 Conclusion/Further Research

The following robustness sections are to be added:

1. different competences of the Agent
2. multiple interest groups
3. interactions between tasks

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