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Abstract

We propose a theory to explain why, and under what circumstances, a politician delegates policy tasks to a technocrat in an independent institution, and analyze under what conditions delegation is optimal for society. Our theory builds on Holmström's (1982, 1999) hidden effort principal-agent model. The election pressures faced by politicians, together with the absence of such pressures for technocrats, give rise to a dynamic incentive structure that formalizes two rationales for delegation, one advanced by Hamilton (1788) and the other by Blinder (1998). Delegation trades off the cost of having a possibly incompetent technocrat with a long-term job contract against the benefit of having a technocrat who (i) invests more effort into the specialized policy task and (ii) is better insulated from shifts in public opinion. A natural application of our framework leads to a new theory of central bank independence.

Key words: delegation, elections, career concerns, learning-by-doing, insulation, central bank independence

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"It is a general principle of human nature, that a man will be interested in whatever he possesses, in proportion to the firmness or precariousness of the tenure by which he holds it; will be less attached to what he holds by a momentary or uncertain title, than to what he enjoys by a durable or certain title; and, of course, will be willing to risk more for the sake of the one, than for the sake of the other."

Alexander Hamilton (1788), Federalist Paper 71: The Duration in Office of the Executive

"Many governments wisely try to depoliticize monetary policy by, for example, putting it in the hands of unelected technocrats with *long terms of office* and *insulation* from the hurly-burly of politics" (emphasis added)

Alan S. Blinder (1998), former Vice-Chairman of the Federal Reserve, pp. 56-57.

1 Introduction

In most countries some important and prestigious public policy tasks, such as interpreting the constitution or conducting monetary policy, are delegated to public officials who are insulated from both job insecurity and political interferences thanks to long term employment contracts. The judges at the U.S. Supreme Court, for example, are appointed for life and are independent of the elected executive. Similarly, many governments delegate monetary policy to an independent institution that is ruled by career public officials whose terms of office are much longer than the average elected official's.

In some cases delegation of political power is constitutionally mandated, as in the case of the Supreme Court in the US, while in others politicians find it in their own interest to delegate power, even if they are not constitutionally required to do so. A voluntary transfer of power has been particularly noticeable in the case of monetary policy in recent decades. Granting the Bank of England independence, for example, was one of the first act of the Labor government when it took power in the United Kingdom in 1997. That politicians give away power, on their own accord, may be considered somewhat of a puzzle. Most people, and many political economy models, assume that politicians are in the game of accumulating power, rather than giving it away.

In this paper, we tackle the following questions. First, why do politicians voluntarily give away some power and delegate critical public policy tasks to technocrats in independent institutions? Second, do politicians delegate enough tasks—i.e., can delegation be optimal from the perspective of society while not being in the interest of the politician, and if so, under what conditions?

To analyze these questions we model the incentives that technocrats and politicians face. Our model assumes a representative democracy where *all* agents have the same preferences. The difference between a politician and a technocrat is that the politician is subject to elections while the technocrat is not. This difference, captured by short-term election pressures, drives all of our results. Election pressures create a rich dynamic incentive structure in our model through the interaction of private and public signals and unobservable effort levels by the policymakers.

The framework we propose underlines a basic cost-benefit trade-off for delegation. The cost of delegation is that the technocrat cannot be dismissed from his job, even if he is incompetent. In the case of the US Federal Reserve this cost is not trivial, since each governor is appointed by the president for a 14 year term (with the exception of the chairman).[1] In the US Supreme Court this cost is even starker because justices are appointed for life. Delegation, of course, is more costly if the ability of job candidates cannot be ascertained *perfectly* prior to hiring (a realistic feature of any hiring decision). Delegation is also more costly if the technocrat is not responsive to changing preferences of the electorate. On the benefit side we identify two benefits of delegation. They formalize Alexander Hamilton's argument for long-term contracts for the executive and Alan Blinder's case for having a technocrat running monetary policy (both cited above).

Hamilton's rationale for delegation to a technocrat with a long-term employment contract is that he will be ready to "risk more"/work harder for a policy task that he holds, with certainty, for a considerable amount of time. In our model a long-term employment contract enables the policymaker to have a long-term horizon which may improve his performance. In particular we show that a longer employment contract gives the long-term appointee an incentive to invest more effort into his *job specific* decision making, due to a learning effect, thereby increasing the quality of his decisions. We label this the *learning-by-doing* effect.

Alan Blinder's argument for delegation is the second benefit we study. Blinder suggests that monetary policy should be put in the hands of unelected technocrats with *long terms of office* and *insulation* from the hurly-burly of politics. We model Blinder's idea by showing that a politician has an incentive to follow the whims of public opinion. In particular, we show that when there is a public signal about the policy problem, the politician has a perverse incentive to follow public opinion even if he has *superior* private information that contradicts it. The reason is that the politician is reluctant to go against public opinion since if he is wrong (and the public is correct) this would signal low ability and lack of good judgement, and prevent the politician from being re-elected. In contrast, by following public opinion the politician reveals nothing about his ability so the public has no incentive to throw him out of office. A technocrat with a long-term job contract, however, does not face this dilemma since he is insulated from the electorate. We label this the *insulation effect*.

We draw several lessons from the model, besides identifying and formalizing the basic trade-off outlined above. One is that the more complex the policy task the more desirable it is to delegate it to a technocrat. Another is that the larger the degree of private benefit from political office (which may include outright corruption) the lower the politician's incentive to delegate. Uncertainty about the competency of officeholder works in the same direction. We are also able

[1] Although if a governor does not complete his term, his successor does not get a new 14 year term, but first has to serve the existing 14 year term. Hence many governors have, in practice, a shorter term once appointed.

to show that delegation is always socially optimal when the policymaker bases his decisions on public opinion, even if the politician may not always find it privately optimal to delegate power in these circumstances. Furthermore, we show that if delegation occurs, it is always socially optimal in our model. The converse, however, is not true; i.e., some tasks are not delegated in equilibrium even though their delegation would improve social welfare.

Our model of dynamic incentives in public policy builds on the seminal career concerns model of Holmström (1982/1999). Holmström shows that, within a firm, a manager of unknown ability can be induced to supply effort that is not directly observed by relying on the manager's concerns about his future career; i.e., implicit incentives motivate the manager. We extend Holmström's model in three ways. First, the manager/policymaker is disciplined by elections, whereas in Holmström's model incentives are shaped by the expectation of higher future wages. Second we introduce learning in the model to formalize Hamilton's learning-by-doing effect. Third, we introduce a public signal about the desirability of the policy decisions to formalize Blinder's insulation effect. The first extension was first introduced by Persson and Tabellini (2000).[2] The second two are new to the literature and are necessary to model the benefits of delegation that we emphasize. A further difference to Persson and Tabellini (2000) is that we study a signal extraction game which may be helpful for many applications, such as studying optimal delegation of monetary policy, as we illustrate in an example in Section 5.

Our paper provides a formalization of the literature on constitutionalism, whereby certain issues are taken "off the table" in everyday policymaking in order to insulate policymakers from short-term pressures of public opinion. One criteria for insulation in this literature is that there should be a broad agreement on the (long-term) goals of policies that are taken "off the table" (see, e.g., Elster (1995) and Drazen (2002)), a criteria that our model satisfies, since all agents have the same preferences.

Maskin and Tirole (2004) address similar questions to ours. They investigate which policy decisions should be made by politicians and which ones should be decided by judges.[3] A similarity between our paper and theirs is that both illustrate that elections give a politician perverse incentives to follow public opinion rather than taking advantage of superior private information. In Maskin and Tirole's two period model, a politician may have a pandering motive because he has a hidden agenda. A politician who is a corporate crony, for example, pretends to be consumer friendly to hide his true preferences for corporate pork, in order to ensure an election in the second period. In the second period he is free to act on his corporate cronyism because he will not be subject to elections at that time. In contrast to Maskin and Tirole's pandering effect our insulation motive is not related to hidden agendas. Instead the politician might follow public opinion to eliminate signals about the quality of his judgement. A politician may choose

[2] See also Le Borgne and Lockwood (2003) who study questions that are more similar to ours although they do not model the learning or insulation effects. Instead they assume that effort and ability are multiplicative which also gives a rationale for delegation (through an "experimentation" channel).

[3] Besley and Coate (2001) contrast direct election with political appointment of regulators in a model where electing regulators produces more pro-consumer regulators.

to support a popular war, for example, not because he wishes to hide that he is a "dove" (so he can act upon his true dovish motives in period 2), but because if the war turns out to be successful he does not want to be the only one who voted against it since this would reveal lack of good judgement. A politician in our model is tempted to follows public opinion because even if the war turns out badly he is not likely to be thrown out of office if everyone else made the same error in judgement. Our insulation motive therefore relates to a different set of policy tasks than Maskin and Tirole's hidden agenda model. It arises because elections give rise to perverse *dynamic incentives* even if all agents have the same political agenda.

Alesina and Tabellini (2006) also address questions similar to ours, i.e., when should policy tasks be delegated to technocrats? A key difference is that Alesina and Tabellini assume that the trade-off between technocrats and politicians stem from the different intrinsic preferences of these agents: some agents are born politicians while others are born technocrats. In contrast, we assume a representative democracy where everyone has ex ante the same preferences. To some extent one may interpret our result as giving foundations for different reduced form utility functions of technocrats versus politicians by modelling how elections change the dynamic incentives of policymakers. Another difference is that while we illustrate the role of insulation and learning, Alesina and Tabellini mainly focus on other reasons for delegation such as issues related to dynamic inconsistency of public policy, which is an important consideration that we abstract from.

2 The Framework

In this section we develop the basic political economy setup. The economy is populated by a large number of citizens and evolves over two time periods, $t = 1, 2$. There is a political office that can be occupied by only one citizen, the "officeholder". In this representative democracy, the officeholder is entrusted with (and held accountable for) policy decisions. The game begins with the random selection/election from the population of a citizen to become the elected officeholder (called "politician" thereafter). The politician can decide whether to make the policy decision himself or to delegate it to an appointed agent, which we call a "technocrat", who is not subject to re-election (i.e., he has a longer term in office).

2.1 Political Agency Setup

We present a simple setup where citizens' utilities are a function of a policy decision. The quality of this policy decision depends both on ability and effort of the officeholder. An individual's utility is given by

$$U_t^j = E \sum_{t=1}^{2} v_t^j$$

where the index j refers either to the officeholder ("o") or a citizen ("c"). The period payoff is

$$v_t^j = v_t^c\,(i_t, \bar{r}_t) + R^j - \frac{\alpha}{2}(e_t^j)^2 \tag{1}$$

where $v_t^c(.)$ is a payoff due to a public policy that accrues to all citizens at time t; this payoff depends on the interaction of the policy decision i_t and a shock $\bar{r}_t$. The term $\frac{\alpha}{2}(e_t^j)^2$ represents the cost of effort. The quality of the policy decision (i.e., the choice of i_t) is a function of how well the policymaker can predict $\bar{r}_t$. This prediction depends on the effort and ability of the policymaker in a way we describe in the next subsection. Since effort is only useful to the officeholder $e^j = 0$ when $j = c$. R^j is a binary variable which is equal to R if citizen j is the officeholder ($j = o$), and zero otherwise. R is an "ego rent" from being in office and managing the public good (as in Rogoff and Sibert, 1988), deriving from the prestige associated with managing public affairs. To economize on notation, we abstract from discounting since it does not add any insight.

To clarify the game we now put more structure on (1) although we will take advantage of the more general formulation in our application in Section 5. In each period $t = 1, 2$, whoever is the officeholder has to make a binary policy decision by choosing i_t^H or i_t^L. This decision can refer to any public policy; one may for example think of it as choosing between whether or not to fight a war, to invest in a public project, or raising or lowering interest rates. For simplicity we assume in the baseline illustration that $\bar{r}_t$ can only take on two values, either $\bar{r}^H$ or $\bar{r}^L$ with equal probability, i.e., $Prob(\bar{r}_t = \bar{r}^H) = Prob(\bar{r}_t = \bar{r}^L) = \frac{1}{2}$, and we assume that the policymaker (and the public) do not know this variable before choosing i_t. The policy problem is thus to select i_t optimally conditional on a forecast about $\bar{r}_t$. In the baseline illustration we normalize the payoffs so that if the policymaker correctly predicts $\bar{r}_t$ then

$$v^c\left(i^H, \bar{r}^H\right) = v^c\left(i^L, \bar{r}^L\right) = 0 \tag{2}$$

and if he makes a mistake then

$$v^c\left(i^H, \bar{r}^L\right) = v^c\left(i^L, r^H\right) = -1. \tag{3}$$

2.1.1 Private signal

The officeholder receives a private signal σ_t about the realization of the shock $\bar{r}_t$. We assume that the quality of the private signal depends both on effort and ability of the officeholder. To make our point in the simplest setup possible, we assume that two signals can occur that correspond to the two shocks, i.e., $\sigma_t \in \{\sigma^H, \sigma^L\}$. If the officeholder bases his decision on his private signal his optimal policy decision is trivial: he will set i^H if he observes σ^H and i^L if he observes σ^L. The combination of the officeholder's forecast and the realization of the shock produce a state s. Four possible states can therefore arise in a given period depending on whether the shock (labeled as H or L) has been rightly (R) or wrongly (W) predicted: i.e., $s = r\sigma \in \{HR, HW, LR, LW\}$. Since we assume symmetric payoffs in the baseline example for HR, LR on one hand and HW, LW on the other the only pay-off relevant events are whether the officeholder is right or wrong. The probability that a new officeholder receives a right signal σ conditional on a shock $\bar{r}$, his effort level e, and expected ability θ is:[4]

$$Prob(\text{Right signal for the officeholder}) = Prob(\sigma^H \mid \bar{r}_1 = \bar{r}^H, e_1, \theta) = Prob(\sigma^L \mid \bar{r}_1 = \bar{r}^L, e_1, \theta)$$
$$= \frac{1}{2} + \theta + e_1$$

and the probability of the wrong signal is:

$$Prob(\text{Wrong signal for the officeholder}) = Prob(\sigma^H \mid \bar{r}_1 = \bar{r}^L, e_1, \theta) = Prob(\sigma^L \mid \bar{r}_1 = r^H, e_1, \theta) \tag{4}$$
$$= \frac{1}{2} - \theta - e_1$$

Here θ is the forecasting ability of the officeholder. It is a random draw from a distribution that can take two values "good" or "bad", i.e., $\theta_G > \theta_B = 0$ with equal probabilities $\frac{1}{2}$. We refer to $a \in \{G, B\}$ as the (ability) types of the citizens. We assume that citizens do not know θ but they all know the joint distribution of θ, i.e., there is *symmetric incomplete information*. This uncertainty can also apply to a subset of the pool of candidates for public office (e.g., citizens with a Ph.D. in economics). All that is needed for our results is that there is some remaining uncertainty among candidates. Of course the probability needs to be between 0 and 1 which implies bounds on the feasible values of e and θ.

When the first-period officeholder is in office in period two, we assume there is a *learning-by-doing* effect, so that

$$Prob(\text{Right signal for officeholder}) = Prob(\sigma^H \mid \bar{r}_2 = \bar{r}^H, e_2, \theta) = Prob(\sigma^L \mid \bar{r}_1 = \bar{r}^L, e_1, \theta) \tag{5}$$
$$= \frac{1}{2} + \theta + \beta e_1 + e_2 \tag{6}$$

and then the probability of the wrong signal is

$$Prob(\text{Wrong signal for officeholder}) = Prob(\sigma^L \mid \bar{r}_1 = r^L, \bar{r}_1, \theta) = Prob(\sigma^H \mid \bar{r}_1 = \bar{r}^H, e_1, \theta) \tag{7}$$
$$= \frac{1}{2} - \theta - \beta e_1 - e_2 \tag{8}$$

where the coefficient $\beta > 0$. We interpret this coefficient as corresponding to the complexity of the task at hand since it implies that effort put in the first-period translates into better learning for period two forecasting. For a complex task one would expect job experience and learning on the job to be extremely important while less relevant for a simple or a manual task. Adding the term βe_1 in the second period production function is a simple and transparent way of introducing a learning-by-doing effect, i.e., experience in office increases the ability of the officeholder. Thus, effort in the first-period is akin to a (sunk cost) investment; if the first-period officeholder is

[4] In an early version of this paper (Eggertsson and Le Borgne, 2003) a richer (but more complex) forecasting technology was presented (whereby ability and effort entered multiplicatively). This gave rise to an experimentation motive.

also in office in the second period, his effort invested in learning (say about the functioning of an economy, the structure of the central bank, etc.) means his accumulated (task specific) knowledge gives him an incumbency advantage compared to a new officeholder.

In the case where there is a new officeholder in period 2 he uses the forecasting technology in 4; a period 1 officeholder that is thrown out of office cannot pass on his *individual-and-job-specific* knowledge to his successor.

2.1.2 Public signal

We also assume that there is a public signal ρ_t about the realization of the shock $\bar{r}_t$ that can take the values ρ^H and ρ^L. We assume that this signal is created through a process similar to the private signal, i.e.,

$$\begin{aligned} Prob(\text{Right public signal}) = Prob(\rho^H \mid \bar{r}_1 = \bar{r}^H) &= Prob(\rho^L \mid \bar{r}_1 = \bar{r}^L) \\ = \frac{1}{2} + E_p\theta &= \frac{1}{2} + \frac{1}{2}\theta_G \end{aligned}$$

and the probability of the wrong signal is

$$\begin{aligned} Prob(\text{Wrong public signal}) = Prob(\rho^H \mid \bar{r}_1 = \bar{r}^L) &= Prob(\rho^L \mid \bar{r}_1 = r^H) \\ = \frac{1}{2} - E_p\theta &= \frac{1}{2} - \frac{1}{2}\theta_G \end{aligned} \tag{9}$$

where $E_p\theta$ is the expected ability of the whole population. This captures the idea that public opinion is formed by the average cognitive abilities of the citizens. Because each citizen does not expect to be pivotal in the policy decision, they do not exert any effort to improve the quality of the public signal. Hence the signal tends, on average, to be of worse quality than the private signal of the officeholder as long as he exerts a positive effort level.

2.1.3 Institutions

The politician (randomly selected from the set of citizens), once "elected" at the beginning of period $t = 1$ decides to have the public good being produced under one of two possible institutions/regimes:

Delegation

At the beginning of period $t = 1$, the politician appoints an agent (a technocrat) to be officeholder and make the policy decision. Since all citizens are ex ante identical, this agent is randomly selected by the politician from the set of citizens, and is (contractually) in office for *both* periods. When the politician delegates the policy decision his utility then becomes the same as that of a (representative) citizen (he is not in charge of policy, so $j \neq o$ in (1)) except that he receives a small political rent from office R^D. This captures the idea that elected office confers some prestige to the politician, and the fact that voters, who in equilibrium understand the motives for delegation, view favorably a politician who delegates a task (say monetary policy), as citizens know that this is welfare increasing for them (this is shown later in the paper), or the

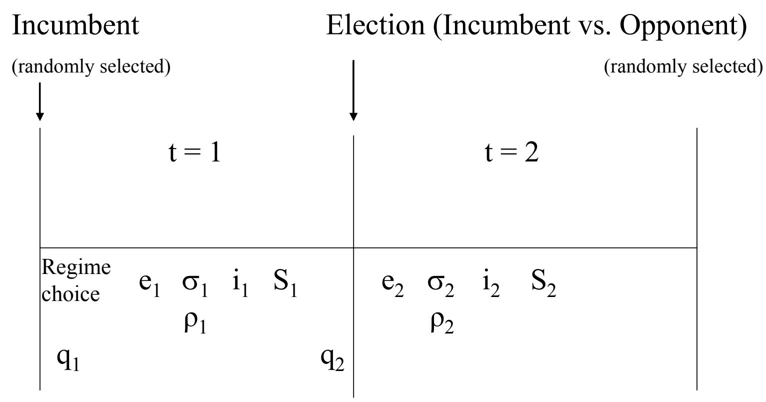

Figure 1: Timing

fact that the politician is the principal of the technocrat, a position that confers some "ego rent". We assume that delegation is credible, i.e., that the politician can make a binding promise not to fire the person he delegates powers to for the duration of the game. This is an important—and entirely reasonable in our view—assumption . To remove a governor of the Federal Reserve or a supreme court justice, for example, is exceedingly hard and while not impossible it would be prohibitively costly for most elected politicians.[5]

Political control

At the beginning of period $t = 1$, the elected politician decides to make the policy decision himself. The politician is in office during period $t = 1$ but faces an election at the beginning of period 2. At this stage, an opponent is randomly selected from the set of remaining citizens. Citizens then vote on the opponent versus the incumbent, and the winner is the officeholder in period $t = 2$.

Under both delegation and political control we impose the individual rationality condition that the officeholder prefers to be in office than not, which is simply the condition that the net rent from office is positive. The timing of events in the game is shown in Figure 1.

[5]For example, Franklin Delano Roosevelt, one of the most powerful President in US history, tried to change the Supreme Court in the spring of 1937 but failed.

3 Hamilton's hypothesis: Learning

In this section we show the basic trade-off between delegation and political control abstracting from the public signal. We show this by illustrating the learning effect that arises due to delegation (this formalizes Hamilton's hypothesis). In Section 4 we introducing a public signal into the model which generates an insulation incentive.

3.1 Equilibrium

In order for the politician to decide whether to make the policy decision himself or to delegate it, he compares his utility under both regimes. This, in turn, is a function of the equilibrium level of effort and ability. We first derive the effort level chosen in period 2. This effort level is the same whether or not there is delegation, since the officeholder faces the same maximization problem in either case. We then calculate the effort choice in period 1, which depends on the policy regime.

3.1.1 Period 2 effort

We solve the officeholder's decision problem by backward induction. In the last period ($t = 2$) we have a static game. The maximization problem of the officeholder (politician or technocrat) is to select e_2 to maximize utility in period 2 that is given by

$$U_2 = \left\{ R - \frac{1}{2}\alpha e_2^2 \right\} - \{\frac{1}{2} - E_a\theta - e_2\}$$

The first bracket is the net rent from office. The second bracket is the probability of the officeholder choosing the wrong policy decision. This probability is decreasing in effort and expected ability of the officeholder, denoted $E_a\theta$. If the officeholder was not in office in the previous period then $E_a\theta = \frac{1}{2}\theta_G$. If the officeholder was in office in the previous period then $E_a\theta = \frac{1}{2}\theta_G + \beta e_1$ because of the learning-by-doing effect explained above. Recall that we assume, for simplicity, that $v^c\left(i^H, \bar{r}^H\right) = v_t^c\left(i^L, \bar{r}^L\right) = 0$ so only the probability of making the wrong decision appears explicitly in this utility function. Also recall that we normalized $v^c\left(i^H, \bar{r}^L\right) = v^c\left(i^L, \bar{r}^H\right) = -1$ so that there is nothing that scales the probability in the utility function. The first order condition of this maximization problem is $\alpha e_2 - 1 = 0$ so that equilibrium effort, denoted e^* is:

$$e^* = \alpha^{-1} > 0 \tag{10}$$

The effort choice does not depend on $E_a\theta$, thus it is independent of the officeholder's ability and his tenure.

3.1.2 Period 1 effort under delegation

When the politician delegates the policy decision, the first-period maximization problem of the technocrat (superscript "T") is to select e_1 (taking the optimal choice of e_2 as given) to maximize expected utility in period 1 that is given by

$$U_1^T = \left\{2R - \frac{1}{2}\alpha e_1^2 - \frac{1}{2}\alpha e_2^2\right\} - \{\frac{1}{2} - \frac{1}{2}\theta_G - e_1\} - \{\frac{1}{2} - \frac{1}{2}\theta_G - \beta e_1 - e_2\} \tag{11}$$

The first bracket captures, again, the net rent from office of the technocrat. The second (third) bracket is the probability of taking the wrong policy decision in period one (two). The probability of making a mistake in period 2 is also a function of effort in period 1 because of the learning-by-doing effect. This leads to first order condition $\alpha e_1^T - (1+\beta) = 0$ so that a technocrat's first-period equilibrium level of effort is

$$e_1^T = \frac{1}{\alpha}(1+\beta) > 0 \tag{12}$$

The first-period effort level is composed of two terms; the first (1) is the first-period gain from increasing effort, while the second (β) represents the marginal gain due to the value of effort in period 1 on the quality of the policy decision in period 2; we call this term the *learning-by-doing effect*. This arises because effort in period one has a long-lasting effect on the officeholder's forecasting ability. This implies that effort is greater in period 1 than the period 2 effort level, i.e.,

$$e_1^T = \frac{1+\beta}{\alpha} > e^* = \frac{1}{\alpha} > 0 \tag{e1A}$$

3.1.3 Period 1 effort without delegation

The analysis is more complex without delegation (i.e., political control) because we have a game of incomplete information. We characterize the perfect Bayesian equilibria (PBE) of this game. The effort choice of the officeholder in period 2, whether he is new in office or not, is $e^* = \alpha^{-1}$. So, the expected utility from electing a new politician in office is

$$U_2^{NP} = -\{\frac{1}{2} - \frac{1}{2}\theta_G - e^*\}$$

where NP stands for electing a "new politician". In deciding between a new officeholder and the incumbent voters compare the expected utility of retaining the incumbent politician which is given by:

$$U_2^{IP} = -\{\frac{1}{2} - q(s_1)\theta_G - \beta e_1 - e^*\}$$

where IP stands for re-electing the "incumbent politician". The variable $q(s_1)$ is indexed by the realization of the state in period 1. It is the probability voters put on whether the policymaker is a good type. Note that this probability depends on the realization of the policy decision and the shock $\bar{r}_1$ both of which are observed before voting. The politician is thrown out of office if $U_2^{IP} < U_2^{NP}$, i.e.,

$$q(s_1)\theta_G + \beta e_1 < \frac{1}{2}\theta_G \tag{13}$$

Note that the learning-by-doing effect, i.e., βe_1, gives the politician an incumbency advantage. We compute the probability $q(s_1)$ by using Bayes rule. In the case where the politician makes a wrong forecast, for example, it can be calculated by computing the probability that the shock is low when the signal is high (this probability is the same, under our assumption, as the one when the shock is high but the signal is low), i.e.,

$$q(s_1 \in \text{Wrong signal}) = q_W(\theta_G, e_1) = \Pr ob(\theta_G \mid \bar{r}_1 = \bar{r}^L, \sigma^H, e_1)$$
$$= \frac{\frac{1}{2}Prob(\sigma^H \mid \bar{r}_1 = \bar{r}^L, e_1, \theta_G)}{\frac{1}{2}Prob(\sigma^H \mid \bar{r}_1 = \bar{r}^L, e_1, \theta_G) + \frac{1}{2}Prob(\sigma^H \mid \bar{r}_1 = \bar{r}^L, e_1, \theta_B)}$$
$$= \frac{\frac{1}{2} - \theta_G - e_1}{2(\frac{1}{2} - \frac{1}{2}\theta_G - e_1)}$$

Substituting this into (13), the officeholder is thrown out of office if and only if the incumbency effect is small enough, i.e.,

$$\beta e_1 < \frac{\frac{1}{2}\theta_G^2}{1 - \theta_G - 2e_1} \tag{14}$$

In order to focus on election versus appointment of officeholder, we assume that this condition is satisfied, since if it were violated the incumbent would always be elected.[6] We can always choose β small enough so that this condition is satisfied (since in the limit, as $\beta = 0$, there is no incumbency advantage).

Using Bayes rule, the probability of the policymaker being a good type conditional on receiving the right signal is given by

$$q(s_1 \in \text{Right signal}) = q_R(e_1, \theta_G) = \frac{\frac{1}{2} + \theta_G + e_1}{2(\frac{1}{2} + \frac{1}{2}\theta_G + e_1)} \tag{15}$$

The choice of first-period policies and effort of the incumbent politician is the e_1 (taking e_2 as given) that maximizes expected utility in period 1 which is given by

$$U_1^P = \left\{R - \frac{1}{2}\alpha e_1^2\right\} + \{\frac{1}{2} + \frac{1}{2}\theta_G + e_1\}(R - \frac{1}{2}\alpha e_2^2) - \{\frac{1}{2} - \frac{1}{2}\theta_G - e_1\} \tag{16}$$
$$- \{\frac{1}{2} + \frac{1}{2}\theta_G + e_1\}\{\frac{1}{2} - q_R(e_1, \theta_G)\theta_G - \beta e_1 - e_2\} - \{\frac{1}{2} - \frac{1}{2}\theta_G - e_1\}\{\frac{1}{2} - \frac{1}{2}\theta_G - e^*\}$$

The difference between this expression and the utility of the technocrat (U_1^T) is that the politician is uncertain whether or not he will stay in office in period 2. This is the reason why the net rent from office in period 2, i.e., $(R - \frac{\alpha}{2}e_2^2)$, is multiplied by $\{\frac{1}{2} + \frac{1}{2}\theta_G + e_1\}$ which is the probability of the officeholder being right in period 1. If he is wrong, he loses the election in the beginning of period 2. The third curly bracket corresponds, as in the delegation case, to the probability of making a wrong decision in period 1. The first term of the second line corresponds to the loss of utility associated with making a wrong forecast in period 2 and this term is weighted by the probability of the politician still being in office. Note that the probability of the politician

[6] We also need to ensure that it is individually rational for both the incumbent and the opponent to stand for election, given voters' cutoff rule. The individual rationality condition requires that this gain be positive. For this to be the case, we impose the weak assumption that $R \geq \frac{\alpha}{2}e^*$, i.e., that the net rent from office is nonnegative.

still being in office needs to be weighted by the probability of being a good type conditional on the politician being re-elected (i.e., he made the right decision in period 1) using the Bayes rule. Finally the last term is the utility of the politician in period 2 if he gets the policy wrong in period 1, weighted by the probability of that happening. In this case he will receive the same utility as the average citizen and the outcome does not depend on his effort in period 1 or 2.

The first order condition with respect to effort is:

$$\alpha e_1 = (R - \frac{1}{2\alpha}) + 1 + \beta(\frac{1}{2} + \frac{1}{2}\theta_G + 2e_1) + \theta_G\{q_R - \frac{1}{2}\} + \frac{\partial q_R}{\partial e_1}\theta_G\{\frac{1}{2} + \frac{1}{2}\theta_G + e_1\} \tag{17}$$

Using (15) we observe that both last two terms equal $\frac{1}{4}\frac{\theta_G^2}{(\frac{1}{2}+\frac{1}{2}\theta_G+e_1)}$ but with the opposite sign and thus cancel out. Assuming that $\alpha \neq 2\beta$ to ensure that a solution exists the effort level that solves (17), denoted e_1^P, is

$$e_1^P = \frac{\{1 + \beta(\frac{1}{2} + \frac{1}{2}\theta_G)\} + \{R - \frac{1}{2\alpha}\}}{\alpha - 2\beta} > 0 \tag{18}$$

We show in the appendix that the denominator of this expression has to be positive. There are two effects that influence the politician's effort, the *learning-by-doing* effect and the *career concerns* effect. As already discussed, the former is related to both the complexity of the task and the expected first-period ability of the officeholder, while the latter is an increasing function of the net rent from office. Under the delegation regime the career concerns effect was not present since the officeholder is in office in period two with probability one (so that his net rent is guaranteed). The career concerns effect (extending Holmström's terminology to the political/administration context) captures the incentive the first-period incumbent has to increase effort above its myopic level so as to raise the probability of staying in office and receiving the net (private) rent from office on top of the utility that each (representative) citizen obtains. The career concerns effect could also be coined a *tournament* effect (Lazear and Rosen (1981); Green and Stokey (1983)), since it induces extra effort through the reward of a prize (the private rent) which is only available to the winner of the election.

3.2 Delegation of Political Power

3.2.1 Welfare and The Existence of Trade-offs Between Regimes

We can now analyze whether a newly elected politician has any incentive to delegate the policy decision. Recall that, by assumption, if a politician delegates the policy decision but still remains in office he gets a rent $R^D > 0$ (as the principal of the technocrat) that is strictly less than the *net* rent from office that the technocrat obtains (and the politician supplies not effort). Let us call the politician's utility when he delegates U^D, and recall that we denote his utility U^P if he does not delegate. Thus the politician delegates iff

$$U^D > U^P \tag{19}$$

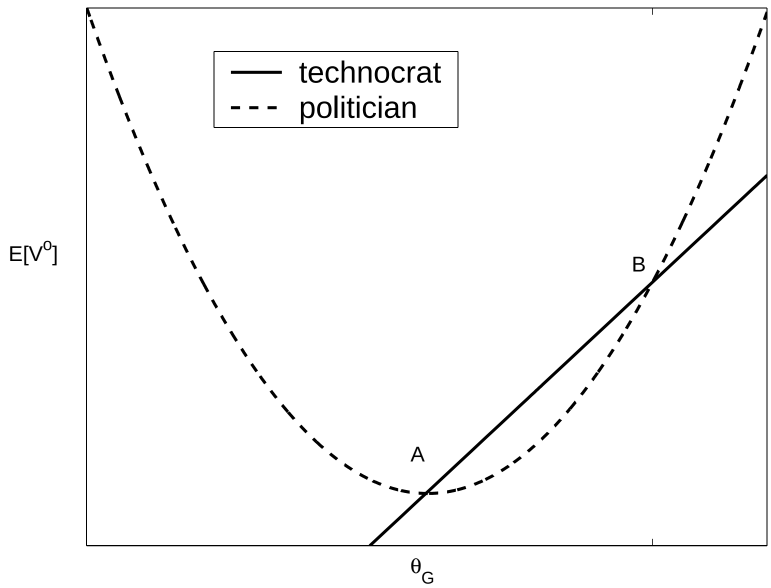

Figure 2: Possible cutoff for welfare

where, after substituting the equilibrium effort values into the above equation, we get

$$U^D = 2R^D - 1 + \theta_G + \frac{(1+\beta)^2 + 1}{\alpha} \tag{20}$$

which is only a function of the structural parameters R^D, θ_G, β and α. Note that this utility is an increasing function of θ_G with a slope of 1. The utility of the politician if he does not delegate can also be written in terms of the structural parameters by substituting (10) and (18) into (16). We can express U^P in terms of a quadratic function of θ_G so that

$$U^P = \gamma_1 + \gamma_2\theta_G + \gamma_3\theta_G^2 \tag{21}$$

where

$$\gamma_3 = \left(\frac{1}{4}\frac{\beta^2}{\alpha - 2\beta} + \frac{1}{4}\frac{\beta^3}{(\alpha - 2\beta)^2} - \frac{1}{8}\alpha\frac{\beta^2}{(\alpha - 2\beta)^2} + \frac{1}{4}\right) > 0$$

and we show in the appendix that γ_3 must be positive for all permissible parameters in the model. Therefore, utility is increasing in θ_G in the positive quadrant (U^D, θ_G) space.

The generic form of U^P and U^D as a function of θ_G (or, in the general case where $\theta_B \neq 0$: $\theta_G - \theta_B$) is shown in Figure 2. The curve when the politician chooses not to delegate is denoted "politician" while the curve when he chooses to delegate is denoted "technocrat".

As can be seen, there are, in general, two possible intersections for these curves. However, only one of them is an admissible equilibrium of our model, namely point B. To see this suppose that point A is an equilibrium. Note that the slope of the U^P curve is smaller than that of U^D. Consider now the utility under Delegation. Using (20) we have

$$\frac{\partial U^D}{\partial \theta_G} = 1$$

and, using the envelope theorem, we can calculate the slope of U^P by taking a partial derivative of (16) to obtain:[7]

$$\frac{\partial U^P}{\partial \theta_G} = 1 + \frac{1}{2}(R - c(e_2)) + \frac{1}{2}\theta_G \beta e_1 + \frac{1}{2}(q_R - \frac{1}{2}) + \frac{\partial q_R}{\partial \theta_G}\{\frac{1}{2} + \frac{1}{2}\theta_G + e_1\} > \frac{\partial U^D}{\partial \theta_G}$$

but we know that this cannot be the case in point A (because the slope of U^P line in Figure 2 is smaller than the technocrat line). So this cannot be an equilibrium for the parameter values we assume (i.e., positive rents and positive effort).

The discussion above indicates that, for a given set of parameters, equilibrium will be on the right hand side of point A in Figure 2. If the ability spread is in the range between A and B delegation dominates political control, while political control dominates delegation to the right hand side of B. To have an interesting theory of endogenous delegation we must show that an equilibrium exists on both sides of point B, depending on the parameters. If this can be established, we can discuss how the equilibrium depends on parameter values and whether or not delegation occurs in equilibrium. Thus the question of most economic interest is whether there *exists* a trade-off between delegation and political control, i.e., are there configurations of the parameters on both sides of B that satisfy all the restrictions of the model?

In addition to the welfare functions derived in equations (20) and (16) a candidate solution has to satisfy the conditions that (i) the implied probabilities of every event are between 0 and 1; (ii) effort is positive; and (iii) the individual rationality constraints of the politician and technocrat are satisfied. The proof of existence of this policy trade-off is trivial. We only need to establish a numerical example that shows that for one set of parameters delegation dominates and in another it does not. This example is given below. With existence of solution established we can discuss how the welfare trade-off depends on the different parameters of the model. That discussion does not require any of parameter values in Example 1.

Example 1. Suppose that the coefficients of the model are $(\theta_G, R, R^D, \alpha, \beta) = (0.2, 0.2, 0.15, 100, 1)$. This implies that $(e_1^T, e_1^P, e^*, U^D, U^P) = (0.02, 0.018, 0.01, -0.45, -0.46)$, i.e., $U^D > U^P$, the necessary conditions are satisfied, and delegation dominates. If we assume instead that $\theta_G = 0.4$ (and the same values for the other parameters) then $(e_1^T, e_1^P, e^*, U^D, U^P) = (0.02, 0.0193, 0.01, -0.25, -0.2402)$, i.e., $U^D < U^P$, the necessary conditions are satisfied, and delegation is dominated so that the politician retains control.

3.2.2 The Welfare Trade-off

The last section established that endogenous delegation can occur and that, whether or not it happens depends on the parameters of the model. In other words the nature of the policy task has an effect on whether or not delegation takes place. We established that it can be *individually rational* for a self-interested politician to delegate policy decisions. In this case the officeholder becomes the agent of the elected politician, who himself is the representative of citizens at large.

[7] One can confirm by (15) that $\frac{\partial q_R}{\partial \theta_G} > 0$ and we know from Bayes rule that $q_R > \frac{1}{2}$.

It is also clear that the individual rationality constraint of an appointed officeholder is satisfied since he also gets a strictly positive private rent from office so that he is better off than the rest of the citizenry. We also showed that the utility of the officeholder is increasing in θ_G whether or not he delegates power but it increases *more* if he retains power, i.e., the slope of U^P is greater than U^D.

The relationship between the utility of the politician with and without delegation is shown in Figure 3 below. This figure corresponds to the right hand side of point A in Figure 2. For small values of the ability parameter, delegation to a technocrat dominates. As θ_G increases (or, more generally, the spread between θ_G and θ_B) the utility of keeping power increases until the two lines cross so that the politician does not delegate any more. The intuition is straightforward and captures—albeit in a crude fashion—the main trade-off between delegation and democratically accountable power: if the politician appoints an independent technocrat he cannot fire him (even if he turns out not to be as competent as expected)! If there is significant uncertainty about the ability of the technocrat, the politician will be increasingly reluctant to give away power that extends beyond his election term because society can be stuck with an incompetent technocrat that cannot be fired.

The slope of the two curves, therefore, indicates that the politician will be more willing to delegate power to technocrats if he can easily identify whether or not the candidates are qualified to handle it, since this implies a lower spread between θ_G and θ_B. In the case of a Governor of the Federal Reserve, for example, one may argue that it is fairly easy to identify the necessary qualification of a candidate (e.g., experience in banking or academia, a Ph.D., etc.). The nature of the task at the Federal Reserve is also fairly uncontroversial and well agreed upon (i.e., pursue "maximum employment" and "stable prices"). Similarly before appointing a judge to the Supreme Court the politician can observe the track record of the technocrat (i.e., the judge) and the objective of the judge is fairly well agreed upon (interpreting the constitution). Arguably the ability of technocrats to perform some other tasks may be subject to a greater uncertainty. Some public offices, fiscal policy for example, depend on interpreting the wishes and needs of the electorate which may frequently shift over time. In this case technical qualification may not be sufficient for determining whether a candidate is suitable for appointment or not, which is an argument for the politician to maintain power in his own hands.

There are other parameters, however, that can lead to endogenous delegation, namely the complexity of the task and rents from office.

3.2.3 Comparative Statics

Having established the existence of a trade-off between delegating power and retaining it, and having showed how it depends on the expected ability of the officeholder we now turn to analyzing the effect of the learning by doing effect, the cost of effort, and rents.

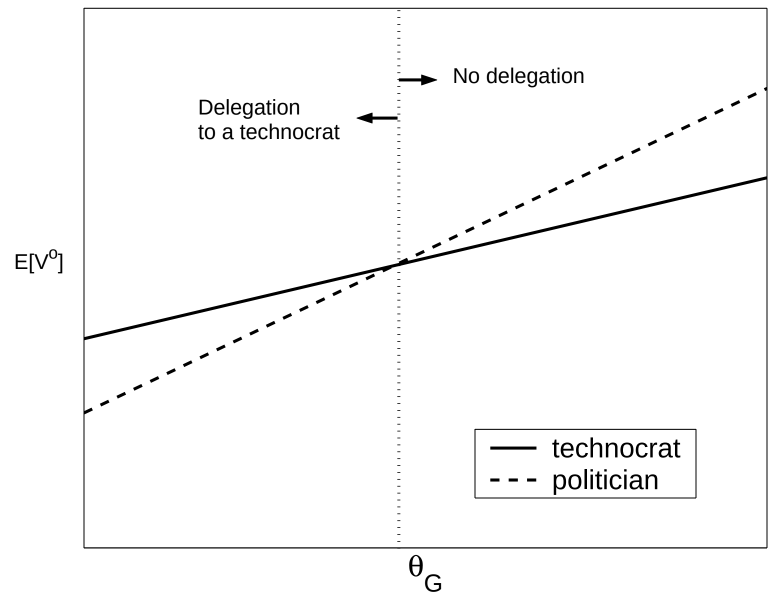

Figure 3: Basic tradeoff in delegation

Learning-by-doing (β) We are interested in knowing the effect at the margin (i.e., around the cutoff point of the two curves in Figure 3) of increasing the learning-by-doing effect in the forecasting task. To do this, we take the partial derivative of U^D, i.e.,

$$\frac{\partial U^D}{\partial \beta} = e_1 = 2\frac{1+\beta}{\alpha}$$

We can use the envelope theorem to calculate the derivative of U^P with respect to β, i.e.,

$$\frac{\partial U^P}{\partial \beta} = e_1(\frac{1}{2} + \frac{1}{2}\theta_G + e_1)$$

Consider the point at which the two curves intersect. At this point we know that the effort level expanded by the technocrat must be higher than that of the politician, so that $e_1^P < e_1^T$, since the technocrat needs to compensate the politician for the loss of rent. This implies that

$$\frac{\partial U^P}{\partial \beta} = e_1^P(\frac{1}{2} + \frac{1}{2}\theta_G + e_1^P) < \frac{1+\beta}{\alpha}(\frac{1}{2} + \frac{1}{2}\theta_G + e_1^P) < \frac{\partial U^D}{\partial \beta}$$

and the inequality follows because we know that $(\frac{1}{2} + \frac{1}{2}\theta_G + e_1) < 1$.

So, the more learning-by-doing on the job, the more desirable it is to delegate power as shown in Figure 4. First, observe that increasing β shifts both curves up so that it increases welfare in both regimes. The reason is that in both cases the officeholder will inherit his effort in period 1 (in the case of the politician this only increases welfare if he is reelected) and the higher β the more useful this will be for policy. The result above illustrates, however, that utility under the delegation regime (the solid curve) increases by more than utility if the politician retains power.

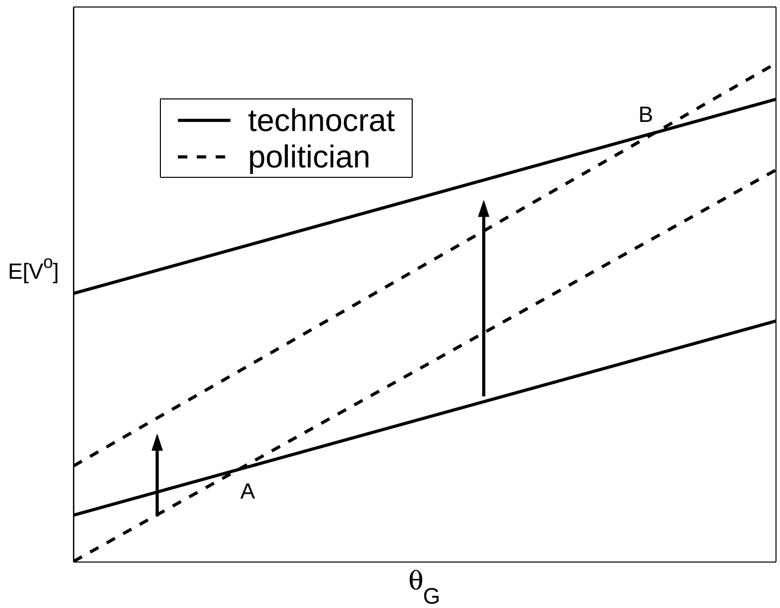

Figure 4: An increase in complexity of the task increases delegation.

The reason for this is that the technocrat has a higher stake in being in office (because he cannot be fired) so that his effort in period 1 is more sensitive to the learning parameter. In contrast, the envelope theorem implies that if the politician conducts the policy task then $\partial e_1^P/\partial\beta = 0$ (when this derivative is evaluated at the optimal e_1^P). Since the utility of the politician (and society in general) is increasing in the effort of the technocrat in period one this increase in the effort by the technocrat raises the politician's utility.

Thus, the more learning-by-doing, the more important it is to give it to a technocrat with a long-term contract because the long-term benefit of being in office gives him the *incentive* to invest in learning (supplying effort). This in effect is reminiscent of Hamilton's claim in the Federalist Paper 71 about the "tenure of the executive" cited in the introduction. Hamilton states "it is a general principle of human nature, that a man will be interested in whatever he possesses, in proportion to the firmness or precariousness of the tenure by which he holds it; will be less attached to what he holds by a momentary or uncertain title, than to what he enjoys by a durable or certain title; and, of course, will be willing to risk more for the sake of the one, than for the sake of the other." In the case of monetary policy there are probably few policy decisions that require more specialized knowledge at the decision level than monetary policy. The Federal Reserve in the US, for example, is the single largest employer of Ph.D. economists in the world. The discussion at FOMC meetings is highly technical where district bank presidents and staff economists may bring to bear a wealth of statistical and economic concepts before a policy decisions are made. It is not uncommon, for example, that policymakers discuss results from sophisticated statistical models with statical error bands, use anecdotes from different Federal Reserve district, and discuss different economic theories to interpret several different data series. There are few if any public policy tasks that involve technical discussion of this kind. In the case of fiscal policy, for example, it is rare that economic or statical theory is discussed in the context of everyday decision making at the US Treasury. It is not always the case, even, that the Secretary of the Treasury is familiar with the technical language required.

One possible interpretation of β is that it reflect "complexity" of the task. It seems reasonable to assume that more learning on the job is important in tasks that are complex than those that are relatively manual and simple.

Private information $(1/\alpha)$ We next consider comparative static with respect to the parameter α^{-1} which indexes the cost of effort. The higher α^{-1} the more effort both the technocrat and the politician will exert and thus the better informed they will be to make the best choice. As α^{-1} reaches the limit of feasible range for the model parameters, the policymaker will exert enough effort to be perfectly informed and reach the best possible decision. We are interested in knowing the effect of increasing $1/\alpha$ at the margin. The partial derivative of U^D is

$$\frac{\partial U^D}{\partial \alpha^{-1}} = (1+\beta)^2 + 1$$

We can use the envelope theorem to calculate the derivative of U^P with respect to α^{-1}

$$\frac{\partial U^P}{\partial \alpha^{-1}} = \frac{1}{2}\alpha^2 (e_1^P)^2 + \{\frac{1}{2} + \frac{1}{2}\theta_G + e_1^P\}\frac{1}{2}$$

Consider now the point at which the two curves U^P and U^D intersect. At this point we know that $e_1^P < e_1^T$ by the same argument as in the last section, so that

$$\frac{\partial U^P}{\partial \alpha^{-1}} = \frac{1}{2}\alpha^2 (e_1^P)^2 + \{\frac{1}{2} + \frac{1}{2}\theta_G + e_1^P\}\frac{1}{2} < \frac{1}{2}(1+\beta)^2 + \{\frac{1}{2} + \frac{1}{2}\theta_G + e_1^P\}\frac{1}{2} < \frac{\partial U^D}{\partial \alpha^{-1}}$$

which suggests that the comparative static of α^{-1} is the same as that of β. Thus our analysis suggests that the higher α^{-1} the higher the incentive for delegate policy to a technocrat and the graphical analysis in Figure 4 applies once again. We suggested in the last subsection that the parameter β was a measure of "complexity" of the policy task. We also wish to suggest a similar interpretation of α^{-1} because it measures the extent of "private information" the policymaker has relative to the public. We defer a further discussion of this interpretation to the next section where we discuss it in the context of the public signal when this interpretation is natural.

Rents and Corruption Finally, we can also see that increasing R will shift the "politician curve" up. This makes delegation less likely. The intuition is immediate: delegation is a way for the politician to increase his utility (and that of a representative citizen) because it depends on the common good. However, delegation comes at the expense of forsaking the net private rent associated with managing the public good (this private benefit can range from an ego rent to outright corruption). To the extent that this private rent is large, the concern of the politician for the public good will be smaller so that he is less likely to delegate.

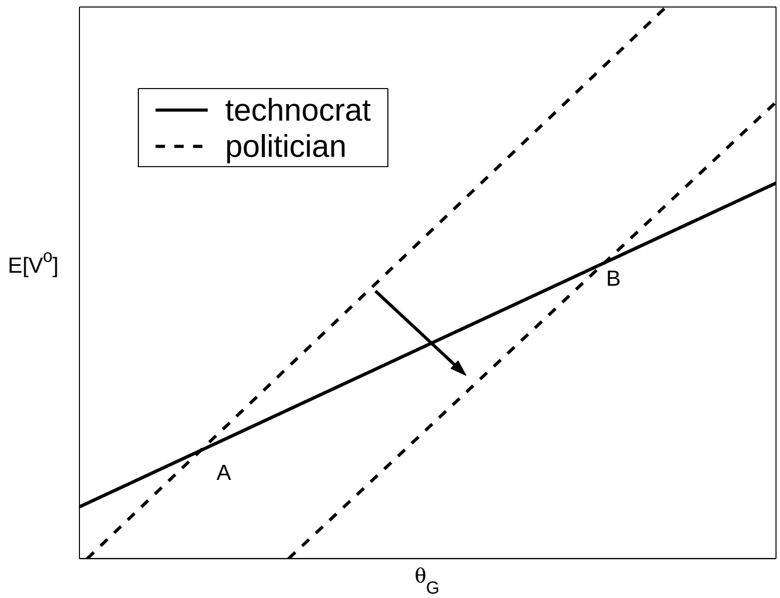

Figure 5: A decrease in corruption increases delegation.

So, to summarize:

Proposition 1. (Endogenous delegation of political power). *In the equilibrium of the model the set of variables* $(e_1^T, e_1^P, e^*, U^D, U^P)$ *depends on the set of variables* $(\theta_G, R, R^D, \alpha, \beta)$. *Delegation occurs if* $U^D > U^P$. *Both delegation and non-delegation equilibrium exist and which arises depends on the value of the parameters* $(\theta_G, R, R^D, \alpha, \beta)$. *For the policy task the following holds at the margin:*

i) An increase in the complexity of the task (measured by α^{-1}*or* β*) increases the incentive to delegate,*

ii) An increase in the rent from office (R) *reduces the incentive to delegate,*

iii) An increase in the uncertainty of the ability of the officeholder $(\theta_G - \theta_B)$ *reduces the incentive to delegate.*

The proof of existence of both equilibria follows from Example 1 and the rest from the discussion in the sections above.

3.3 Social welfare and delegation

Proposition 1 establishes a theory of delegation. It shows that the decision to delegate depends on the properties of the policy task and how it affects political rents. The question we now turn to is whether or not delegation is optimal for society as a whole (if it occurs) rather than from the perspective of the politician. Thus the question is under what circumstances $U_c^D > U_c^P$ where D denotes delegation, P that the politician retains power and c indicates that utility refers to that of the representative citizen. Observe that the politician's utility is the sum of his private rent from office and the citizens utility U_c^D or U_c^P. Assuming that the policymakers delegates, it is then straight forward to show that this is socially optimal if

$$2R^D < 2R - c(e_1^P) - c(e_2^P) \tag{22}$$

This condition implies that delegation will always be socially optimal as long as the "rent" the politician obtains by delegating power is smaller than the net rent he extracts when he performs the public task himself. We consider this to be a sensible condition to impose. The case when delegation occurs because the politician can extract higher private rents by delegating is theoretically uninteresting because in that case one could always engineer delegation by making R^D arbitrarily high. It is also implausible that a politician would receive higher *private* rents from the public office by giving it to someone else. Indeed imposing condition (22) makes our theory more interesting—and plausible—because it implies delegation can be optimal for the politician *even if* it reduces his net private rents.

So, to summarize:

Proposition 2. *Assume condition (22) holds. When delegation occurs, it is socially optimal.*

Even if delegation is always socially optimal under condition (22) it may well be the case that the politician does not want to delegate. In other words we may have the condition $U_c^D > U_c^P$ but $U^D < U^P$. This can arise because the politician may receive high rents from the policy task that more than compensate the (social) gains from delegating. In this case it would be optimal for the society to "force" the politician to delegate by constitutional rules.

4 Blinder's hypothesis: Insulation

We now turn to another key rationale for delegating policy to a technocrat: the fact that a technocrat is insulated from the whims and pressure of the citizenry while politicians may become "slaves of public opinion". It is indeed well known that politicians have a hard time contradicting or confronting the electorate prior to elections. To be more precise they have an incentive to ignore the superior private information they have about the policy choice and instead base policy on public opinion. This is always sub-optimal in our model because citizens all share the same preferences and the politician is not maximizing these preferences by following public opinion but instead sacrificing social welfare to be re-elected.

The setup is the same as in Section 3.1 except for the following changes. We now introduce the public forecast (ρ_t, $t = 1, 2$) of the shock which becomes available at the beginning of every period. As discussed in section 2, this forecast if formed in accordance to the same forecasting technology as the officeholders forecast, except that, since only the politician is compensated for supplying effort in producing the forecast, citizens' forecast are based only on average expected ability (i.e., citizens' effort is zero[8]). Recall that the officeholder's forecast is his private information so that

[8] We are assuming that there are many citizens so that each citizens opinion will not weigh much in public opinion. In this case the citizen will have no incentive to invest any effort.

he can either reveal it (as in the previous section) by basing his decision on it, or hide it by basing his decision on the public signal. Note that if the politician follows public opinion his actions will reveal nothing about his type. As a consequence we will see that, in equilibrium, he will always be re-elected since he has an incumbency advantage. This assumption captures the idea that a politician can always claim that a shock turned out to have been exceptional and that he cannot be blamed for it since the whole population agreed about the forecast.

When the politician can follow public opinion three equilibria are possible: (1) the politician delegates power to a technocrat (who is, by design, insulated from public opinion); (2) the politician does not delegate but uses his (superior, in expectations) private information to make policy choices; and (3) the politician does not delegate but mimics public opinion (public opinion equilibrium). The first and the second equilibria are exactly the same as we analyzed in the last section, since in these cases the public signal is ignored. We therefore turn directly to the public opinion equilibrium.

4.1 Public Opinion Equilibrium

In case the politician decides to follow public opinion in period 1 and base his decision on the public signal, his maximization problem becomes:[9]

$$\max_{e_1} U_1^{PO} = \left\{2R - \frac{1}{2}\alpha e_1^2 - \frac{1}{2}\alpha e_2^2\right\} - \left\{\frac{1}{2} - \frac{1}{2}\theta_G\right\} - \left\{\frac{1}{2} - \frac{1}{2}\theta_G - \beta e_1 - e_2\right\} \tag{23}$$

Throughout, the "PO" superscript refers to the politician following "public opinion". The first bracket captures, again, the net rents from office of the politician. The second bracket is the probability of taking the wrong policy decision in period one. When the politician follows public opinion this probability does not depend on his effort in period 1 since he will not base his decision on his private signal in that period. The last bracket is the probability of making the wrong policy decision in period two. Note that the probability of making a mistake in period 2 is also a function of effort in period 1 because of the learning-by-doing effect. The above problem leads to the following equilibrium effort level

$$e_1^{PO} = \frac{\beta}{\alpha} > 0 \tag{24}$$

which, depending on whether $\beta > 1$ or not, is higher (or not) than $e^* = \alpha^{-1}$, the period 2 effort level. Due to the learning-by-doing effect and a positive effort in period 1 it is easy to verify that the politician will always be re-elected. The reason is that, although his first-period action does not reveal any information to the public (because it is conditioned on the public signal), since the politician puts in (strictly) positive effort in period 1, he is expected to do better than anyone that runs for office against him (an incumbency advantage). To summarize:

[9] We are assuming parameters such that the politician would never want to resign voluntarily and would never want to follow public opion in period 2. It can be verified that we can always assume parameters for the rent and β so that this is the case.

Proposition 3. *If the politician follows public opinion he is always re-elected.*

Using this proposition we can then express the utility of the politician if he follows public opinion. It is obtained after substituting the equilibrium effort values (10) and (24) into (23), i.e.,

$$U^{PO} = 2R - 1 + \theta_G + \frac{1+\beta^2}{2\alpha} \tag{25}$$

When the politician follows the whims of public opinion utility takes exactly the same form as welfare under delegation, i.e., the line has a slope 1 in (U, θ_G) space. To investigate whether a politician will find it individually rational to follow public opinion and ignore his private information, we can perform the same analysis as when analyzing whether or not the politician delegates (Section 3.2). If we draw up a diagram in (U, θ_G) space we get the same picture as shown in Figure 3 with the line for the technocrat being replaced by the non-insulated politician. Thus the politician may, or may not choose to follow public opinion, depending on parameter values. It is easy to verify the proposition below following the steps shown in the previous section. In Proposition 4 we denote the equilibrium when the politician bases his decisions on his private information rather than public information by "P", and it is the same equilibrium as analyzed in last section where "P" stood for "politician":

Proposition 4. *In the equilibrium of the model the set of variables* $(e_1^{PO}, e_1^P, e^*, U^{PO}, U^P)$ *depends on the set of variables* $(\theta_G, R, \alpha, \beta)$. *The politician always follows public opinion if* $U^{PO} > U^P$. *Both equilibria exist, and which arises depends on the value of the parameters* $(\theta_G, R, \alpha, \beta)$. *For the policy task the following holds at the margin:*

i) An increase in the complexity of the task (β) *reduces the incentive to follow public opinion,*

ii) An increase in the rent from office (R) *increases the incentive to follow public opinion,*

iii) An increase in the uncertainty of the ability of the officeholder $(\theta_G - \theta_B)$ *reduces the incentive to follow public opinion.*

We now investigate whether a politician that always follows public opinion would ever choose to delegate policy to a technocrat so as to insulate the policy decisions from the whims of public perceptions.

4.2 Welfare and The Existence of Trade-offs Between Regimes

Consider a range of parameters $(\theta_G, R, \alpha, \beta)$ so that the politician prefers to follow public opinion (i.e., $U^D > U^{PO}$). Note that this inequality does not depend on the value of θ_G. This is because the politician will never be fired. The key trade-off in this case comes through variations in the parameter α. The reasons for this is that, for low values of α, the technocrat invests more effort into policy making and thus has superior information about the policy task compared to the public. The politician that follows public opinion, however, invests little effort since he does not take advantage of his private information. This means that the cost of following public opinion is higher the lower is α. Figure 6 highlights the basic trade-offs facing a politician that follows

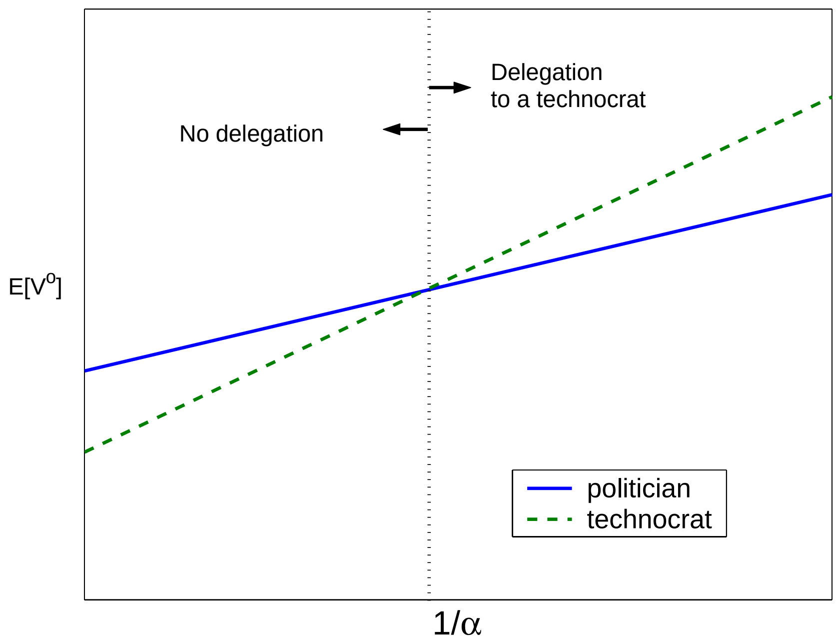

Figure 6: Basic insulation/mimicking tradeoff

public opinion. His welfare increases more slowly in α^{-1}—which is a measure of his private information—if he retains the policy task than if he delegates it to the technocrat. This can be seen by taking a partial derivative of U^D with respect to α^{-1}, i.e.,

$$\frac{\partial U^D}{\partial \alpha^{-1}} = 1 + \beta^2 + 1 + 2\beta > \frac{\partial U^{PO}}{\partial \alpha^{-1}} = \frac{1+\beta^2}{2}$$

Furthermore the higher the value of β the higher the incentive of a politician that follows public opinion to delegate to an insulated technocrat. To see this note that

$$\frac{\partial U^D}{\partial \beta} = e_1^T = \frac{1+\beta}{\alpha} > \frac{\partial U^{PO}}{\partial \beta} = e_1^{PO} = \frac{\beta}{\alpha}$$

The intuition for why a higher β increases the incentive for delegation is straight forward. Since the insulated technocrat supplies a higher effort in period 1 than the politician (because he uses this effort to retrieve a private signal for policy making), β, the learning-by-doing parameter, has a stronger impact on utility under delegation.

Interestingly, we can interpret both these parameters (i.e., α and β) as the degree of complexity of a task. Presumably the more complex the task is, the more important the learning effect is. One may also argue that the more important private information is for a given task—namely information that is only available to the technocrat—the more complex and "specialized" that task is. Thus these two effects reinforce each other: the more complex the task, the more important it is to delegate it.

Proposition 5. *The more complex the policy task (as measured by an increase in β and*

α^{-1}), the more likely a politician that is a slave of public opinion is to delegate it so that the policymaker is insulated from the whims of public opinion.

One implication of our analysis, which should be clear from the above discussion, is that if an equilibrium takes place in which the politician ignores his own information in favor of public opinion, it is always socially optimal to delegate to an insulated technocrat. To see this, note that when the politician follows the public opinion he does not reveal anything about his type; this indicates that there is no advantage of elections. In contrast there is always a benefit to delegation, since under delegation the technocrat is insulated from public opinion and, therefore, has an incentive to use his (superior) private information rather than the public signal. It is not guaranteed, however, that a politician who would follow public opinion would want to delegate even if it were socially optimal to do so. This depends on the private rents he extracts from office and the other parameters of the model. To summarize:

Proposition 6. *If the politician ignores his private information and follows public opinion in equilibrium, it is always socially optimal to delegate power to an insulated technocrat. However, it may not be in the interest of a politician to delegate.*

Another implication of the analysis is that the public signal makes it less likely that a politician chooses to delegate. This should be obvious because the public signal can only make a politician that chooses to retain power better off (since he is always free to ignore the signal). For a public signal to increase the incentive to delegate we would need to introduce some altruistic motives for politician (e.g., a legacy motive) or a belief that delegation today can commit future politicians to leave the policy task in the hands of technocrats. These extensions seem relatively straightforward and we leave them to future research.

5 Example: Central Bank Independence

In this section we embed our simple political economy model of Section 2.1 into a small but standard macro model to give an example of how the more general theory can be applied in practice. To do this we consider the standard "Phelps problem"[10] whereby the government minimizes deviation of inflation and the output gap from zero subject to an expectation-augmented Phillips curve, as in Kydland and Prescott (1977) and Barro and Gordon (1983). Unlike these authors we do not assume there is any inflation bias. The inflation bias is one of the traditional motivation for central bank independence. The Nobel prize committee, for example, cited central bank independence as one of the main practical implication of Kydland and Prescott's (1977) derivation of the inflation bias in its prize announcement in 2004. Here we illustrate how our mechanism can be considered as a complementary rationale to the inflation bias for central bank independence. Our theory of delegation, however, can be used for many different applications than monetary policy.

[10] This was first coined the Phelps problem by Thomas Sargent.

The period utility function of a (representative) citizen is given by Kydland-Prescott preferences:

$$v_t^c = -\frac{1}{2}\pi_t^2 - \frac{1}{2}\lambda x_t^2 \tag{26}$$

where π_t is inflation and x_t is the output gap, i.e., the deviation of output from the natural rate of output. The supply side is characterized by an expectation-augmented Phillips curve, as in Kydland and Prescott (1977),

$$\pi_t = \kappa x_t + \pi_t^e, \quad t = 1, 2 \tag{27}$$

where π_t^e denotes expectations of inflation that are formed before monetary policy is set in each period. We extend the Kydland-Prescott example by adding a demand side that relates the output gap to monetary policy

$$x_t = -\varepsilon(i_t - \bar{r}_t), \ t = 1, 2 \tag{28}$$

where i_t is the nominal interest rate and $\bar{r}_t$ is the natural rate of interest (Kydland and Prescott, in contrast, assume that the central bank controls inflation directly). Like the loss function and the Phillips curve, a demand equation of this kind can be derived from microfoundations, as illustrated for example in Eggertsson (2003). The natural rate of interest is only a function of exogenous shocks. It is the real interest rate that is consistent with output being at the natural rate of output at all times. We assume that the central bank chooses i_t in each period before the shock is realized so that the policy problem is exactly the same as discussed in Section 2 (but here the loss function is *endogenous* since it is a function of π_t and x_t). As before we assume that $\bar{r}_t$ is equal to r^H and r^L with equal probability.

If the central bank could perfectly forecast the natural rate of interest, it would set $i_t = \bar{r}_t$, resulting in zero inflation and zero output gap. This minimizes the bank's loss function. If the central bank cannot perfectly forecast the natural rate of output, this equilibrium may not be feasible. For example, if the central bank misses the target for the natural rate of interest so that $i_t < \bar{r}_t$, there will be excessive inflation and output will be above its natural level. By contrast, if $i_t > \bar{r}_t$ there will be deflation and output slump. Since the central bank sets the nominal interest rate before observing $\bar{r}_t$, its problem is to predict the future value of $\bar{r}_t$ in order to minimize its losses.

In the last (second) period, the maximization problem of the officeholder is to

$$\max_{\{e,i,\pi\}} E\left[v^o\right] \tag{29}$$

We analyze optimal policy under discretion. The government treats expectations as constants and this reduces the problem to a one-period model.

From (27) and (28), we get

$$x = -\varepsilon(i - \bar{r}) \tag{30}$$

$$\pi = -\varepsilon\kappa(i - \bar{r}) + \pi^e \tag{31}$$

$$x = -\varepsilon(i - \bar{r}) \tag{32}$$

where the government treats π^e as a constant. After substitution of (30) and (32) into (29), the maximization problem of the officeholder becomes

$$\max_i \frac{1}{2}(-\varepsilon\kappa(i^\sigma - \bar{r}^s) + \pi^e)^2 + \frac{1}{2}\lambda\left(-\varepsilon(i^\sigma - \bar{r}^s)\right)^2 \tag{33}$$

and the subscript $S\sigma \in \{HR, LR, HW, LW\}$ refers to the combination of the shock $s \in \{H, L\}$ and the forecast $\sigma \in \{H, L\}$, i.e., whether σ turns out to be a correct (R) forecast about S or not (W).

After rearranging the first-order conditions (w.r.t. e, i^H, i^L, π_{HR}, π_{HW}, π_{LR}, π_{LW}), the equilibrium values of i^H, i^L, π_{HR}, π_{HW}, π_{LR}, π_{LW} are:

$$i^H = \left(\frac{1}{2} + E_2[\theta]\, e\right)\bar{r}^H + \left(\frac{1}{2} - E_2[\theta] - e\right)\bar{r}^L \tag{34}$$

$$i^L = \left(\frac{1}{2} - E_2[\theta]\, e\right)\bar{r}^H + \left(\frac{1}{2} + E_2[\theta] + e\right)\bar{r}^L \tag{35}$$

$$\pi_{HR} = \varepsilon k\left(\frac{1}{2} - E_2[\theta] - e\right)\left(\bar{r}^H - \bar{r}^L\right) \tag{36}$$

$$\pi_{HW} = -\varepsilon k\left(\frac{1}{2} + E_2[\theta] + e\right)\left(\bar{r}^H - \bar{r}^L\right) \tag{37}$$

$$\pi_{LR} = -\varepsilon k\left(\frac{1}{2} - E_2[\theta] - e\right)\left(\bar{r}^H - \bar{r}^L\right) \tag{38}$$

$$\pi_{LW} = \varepsilon k\left(\frac{1}{2} + E_2[\theta] + e\right)\left(\bar{r}^H - \bar{r}^L\right) \tag{39}$$

$$x_s = k^{-1}\pi_s; \quad s \in \{HR, LR, HW, LW\} \tag{40}$$

where $E_2[\theta] = q\theta_G + (1-q)\,\theta_B + e_1$. Note here that we define the notation $E_2\theta$ as expected ability that includes the effort in the previous period.[11] We can notice that, with an endogenous loss function, all the equilibrium values are now functions of the expected ability of the officeholder, i.e., $e = e^*(q) > 0$, $i^H = i^{H*}(q)$, $i^L = i^{L*}(q)$, $\pi_s = \pi_s^*(q)$, and $x_s = x_s^*(q)$. To find the value for e we again obtain condition (10); we can then substitute the endogenous values of π_s and x_s into the loss functions and obtain the solution for e_2, i.e.,

$$e_2^{s_1} = \frac{\phi}{\alpha - \phi}E_2^{s_1}\theta, \qquad s_1 \in \{HR, LR, HW, LW\}$$

where we assume that the cost function is $c(e) = \frac{1}{2}\alpha e^2$ and defined the following coefficient $\phi = 4(1 + \frac{\lambda}{\kappa^2})\varepsilon^2 k^2\left(r^H - r^L\right)^2$. Note that we need $\alpha > \phi$ for an equilibrium with positive effort to exist. The effort choice depends on the realization of s_1 in period 1 since this has an effect on the expected ability of the officeholder. Note that this implies that in the macroeconomic setup the effort choice can be higher under delegation in both period 1 and 2, whereas in our previous section the effort choice was the same in period 2 across the two regimes.

The first-period allocation, as far as the macroeconomic variables is concerned (i.e., i^H, i^L, π_s, x_s), will be the same as those derived in (34)-(40) except that we replace $E_2[\theta]$ with $E_1[\theta]$

[11] However, as in Section 3, under Democracy, if the incumbent politician is not reelected, the e_1 term drops out.

and in this case e_1 does not appear in the expression for $E_1[\theta]$. The derivation of the first-period equilibrium effort level follows directly from the analysis of Section 2.1 with the added analytical complication that the loss function is endogenous. Note that the derivations (34)-(40) imply that, for given ability, a higher level of effort reduces output and inflation variability. Since delegation implies higher effort this implies that *if* a politician delegates power *then* central bank independence leads to a reduction in both output and inflation variability.

Our example makes some progress along a dimension that some have considered as a limitation of the literature on central bank independence. Much of this literature implies (see, e.g., Rogoff, 1985) that society delegates policy to achieve lower inflation variability, but at the cost of inducing higher variability in output (for a notable exception see Alesina and Gatti, 1995). Some argue that this prediction is not consistent with the data and that output and inflation variability usually go hand in hand (e.g., Alesina and Summers, 1993). In our example, delegation is not aimed at lowering inflation volatility at the expense of higher output volatility. Instead, it occurs to insulate monetary policy making from public opinion and facilitate learning. As a consequence our theory is consistent with a decline in output volatility going hand in hand with lower variability in inflation.

The model implies that average inflation is zero across regimes. This can be seen from equations (34)-(40). The model can be extended to imply that central bank independence also implies lower average inflation. Assume that society's loss function given by (26) is modified to:

$$v_t^c = -\mu_t \left[\frac{1}{2}\pi_t^2 + \frac{1}{2}\lambda x_t^2 \right] \tag{41}$$

This is a generalization of the previous loss function since we now allow the loss function to depend on the state of the economy so that $\mu_t(s)$ can take four values, i.e., $s \in \{HR, LR, HW, LW\}$. This loss function allows for asymmetry across states of the economy. In particular, one can consider the possibility that society attaches higher losses to a recession (i.e., a negative output gap and deflation) than to an expansion (i.e., a positive output gap and inflation), i.e. $\mu^{HR} < \mu^{LR}$ and $\mu^{HW} < \mu^{LW}$.

For a given level of effort, we can now solve for the optimal level of inflation, output and interest rate following the same steps as in the previous section. The only difference is that now $\pi^e \neq 0$. The resulting expressions for π_s and x_s are somewhat more complicated. What they illustrate is that a higher level of effort does not only reduce inflation and output variability but also the average level of inflation. When the central bank weighs recessions and booms differently, average inflation is different from zero. Since the central bank puts a lower weight on an economic boom than on a recession, it sets the nominal interest rate as if it is giving a higher probability on the recessionary state relative to the solution derived in the previous section. This causes an average inflation bias that is unrelated to the standard inflation bias.[12] What is immediately clear, however, is that a higher level of effort decreases average inflation since a higher level of

[12] Using the word "bias" here may be somewhat misleading, since higher average inflation is *optimal* for this social loss function (as opposed to the standard inflation bias that is suboptimal and is due to inefficient lack of credibility–the time inconsistency problem in monetary policy).

effort improves the accuracy of the central bank's forecast. Since central bank independence, when it occurs, is associated with higher effort, central bank independence leads not only to lower variability in output and inflation, but it also reduces the average level of inflation.

The standard argument for an independent central banker is that such a delegation can reduce or even eliminate an inflation bias (e.g., Rogoff, 1985). The theory of central bank independence that emerges from our simple example, however, does not rely on dynamic inconsistency, as is the case with existing theories of independent central banks. To the extent that preferences are heterogeneous, therefore, it will generally be better that the preferences of the policymaker reflect that of the underlying population. If one defines goal independence as the freedom for the central banker to choose its own goals, one can show from our model that while instrument independence is socially optimal, goal independence is not.

While the theory of central bank independence that is derived from this simple example does not rely on a dynamic inconsistency of monetary policy, as standard theories of central bank independence do, our theory does not contradict the conventional story. In this respect our story is a complement, rather than a substitute, for existing theories of central bank independence.

6 Conclusion

In this paper we have studied the costs and benefits of delegating public policy to an independent agency outside the political spectrum (i.e., free from election pressures). To get at the heart of the issue—the role of election pressures—we considered the most simple framework possible: a two period model with the possibility of elections at the end of period 1. While this framework is extremely simple, we hope that it gets at some basic issues that are likely to remain important in a more general setting. In particular, the dynamic incentive structure that arises because of elections enables us to formalize both Hamilton's (1788) and Blinder's (1998) rationales for delegation. Delegation trades-off the cost of having a possibly incompetent technocrat with a long-term job contract against the benefit of having a technocrat who (i) invests more effort into the specialized policy task and (ii) is better insulated from the whims of public opinion. We then showed the relevance of our model in the context of monetary policy and obtained new insights and conditions regarding central bank independence. To conclude, we wish to underline some limitations and suggest further extensions of the framework.

Perhaps the most important issue we abstract from is the role of dynamic inconsistency. We do so—not because we believe dynamic inconsistency is unimportant—but because that issue has been extensively studied before (the role of dynamic inconsistency in delegation of public tasks is analyzed by Alesina and Tabellini, 2006) and our goal is to focus instead on the role of election pressures on the incentives of the policymaker. Another important abstraction is the assumption that all agents have the same preferences. By abstracting from heterogenous preferences we exclude the possibility that the policymaker may have a hidden agenda. As shown by Maskin and Tirole (2004) hidden agendas can give the policymaker an incentive to pander to public opinion, a consideration that is not captured by our model but would tend to tilt the results even further towards delegation.

Perhaps the most important limitation of our model is that it has only two “periods”. An important extension would include several periods – which we believe is relatively straight forward. Our conjecture is that our results would generalize to this setting, i.e., Blinder’s and Hamilton’s hypothesis—that we formalize—would still be of great importance to understand the basic trade-offs for delegation. This extension, however, is also important for other reasons than to illustrate the robustness of the trade-offs that we illustrate. An extension of this kind could answer several questions in political economy that are quite unrelated to the issue of optimal delegation of political power, because it would allow us analyze the *optimal degree of election pressures* over time for a given policymaker. In contrast we have assumed that this is an *either/or* question because in our model the policymaker either faces elections at the end of period 1 or not. There is no middle ground. While this seems appropriate to analyze the choice between a politician and technocrat it rules several interesting possibilities that lie between those two extremes, i.e. how frequently should elections occur for the elected politician? What is the optimal term length? An extension to multiple periods—that allows for intermediate cases with varying degrees of election pressures—could answer questions such as: (1) Why did almost all US states in the period 1910-1970 lengthen the term of state governors from 2 years to 4 years? An analysis along the lines of our model would suggest that a 2 year term made the governor more susceptible to short-term pressures and also did not give the officeholder enough incentive to invest effort into learning on the job. These channels would be two reasons for the increase in state governors term length. The fact that terms were increased at different times in different states could give some empirical content to the various determinants of delegation we analyze in the model. (2) What tasks should be allocated to the Supreme Court in the United States (where members are appointed for life), which tasks should be allocated to Senate (where each senator has a term-length of 6 years), which ones to the President (with a 4 year term), and which policy tasks should allocated to the House of Representatives (each congressman has a term of 2 years). Our basic framework would suggest that the role of learning on the job, resistance to short-term political pressure and the danger of ending up with incompetent policymakers would all be important to understanding the optimal task allocation. Our hope is that the present framework will be helpful in addressing these important questions in future work.

A Appendix

A.1 Proof that $\alpha - 2\beta > 0$

First note that, since the probability has to between 0 and 1, we have that

$$\frac{1}{2} + \frac{1}{2}\theta_G + e_1 + \beta e_2 \leq 1$$

and that, using the equilibrium values for e_1 and e_2 under Delegation, we have

$$\frac{1}{2} + \frac{1+\beta}{\alpha} + \frac{\beta}{\alpha} \leq 1$$

so that

$$\frac{1+2\beta}{\alpha} \leq \frac{1}{2}$$

and

$$2(1+2\beta) \leq \alpha$$

which gives

$$\alpha - 2\beta \geq 2(1+\beta) > 0 \tag{42}$$

□

A.2 Proof that the coefficient γ_3 of $U^D = \gamma_1 + \gamma_2\theta_G + \gamma_3\theta_G^2$ is strictly positive

The coefficient γ_3 is strictly positive if

$$\frac{\beta^2}{\alpha - 2\beta} + \frac{\beta^3}{(\alpha - 2\beta)^2} > \frac{1}{2}\alpha\frac{\beta^2}{(\alpha - 2\beta)^2}$$

i.e., if

$$\begin{aligned}
(\alpha - 2\beta)\beta^2 + \beta^3 &> \frac{1}{2}\alpha\beta^2 \\
\alpha\beta^2 - \beta^3 &> \frac{1}{2}\alpha\beta^2 \\
\alpha - \beta &> \frac{1}{2}\alpha \\
\frac{1}{2}\alpha - \beta &> 0 \\
\alpha - 2\beta &> 0
\end{aligned}$$

which we know is strictly positive by (42).□

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