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A Drawback of Political Accountability

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We investigate the behavior of an incumbent politician in the presence of career concern in a multiple-task setting with both adverse selection and moral hazard. We show that an incumbent politician faced with an election appropriates less rent than he would under no career concerns, but at the same time distorts policy choice to signal his type. Due to the conflicting effects, the overall effect of political accountability on welfare is ambiguous. This also implies that contrary to some existing literature, the productivity of politicians retained by elections may improve over time. We also consider the implication of our analysis for term limits.

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I. Introduction

It has long been noticed by economists and political scientists that like other economic agents, politicians are affected by career concerns. In the context of politics, career concerns take the form of facing elections. It is generally believed that elections enhance political accountability by giving politicians the incentive to work harder in order to survive the elections. Implicit in this belief is the assumption that the effects of such incentives are beneficial to the general public; politicians work harder to win the election and naturally it will do good to the voters.

On reflection, however, enhancing political accountability may generate conflicting effects. On one hand, rent seeking politicians who face elections may work harder to win the election. On the other hand, such incentives may induce politicians to distort policy choice in order to impress voters. For example, incumbent politicians may allocate resources in such a way that voters get

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immediate benefits before election.

The second effect obtains trivially if voters vote for the incumbent as a *quid pro quo*, i.e., if they cast their vote to the incumbent in return for the benefits they have received. If voters base their decision solely on the benefits they receive, politicians will try to improve their short run performance to impress the voters. However, such a 'transaction' can hardly be rational for the voter since a rational voter should compare the future payoffs that the incumbent will bring if he is reelected with those that a new politician may bring. If, however, the voters can extract some information about the incumbent from the policy choice and if the information can be used to forecast their future payoffs, such a retrospective behavior can be accommodated in a rational voter framework.

In this paper, we investigate the behavior of an incumbent politician in the presence of career concern in a multiple-task setting with both adverse selection and moral hazard. We show in a rational voter framework that an incumbent faced with an election would appropriate less rent but distort policy choice, whereas an incumbent without such concerns would not distort policy choice while appropriating more rent. A brief overview of the model is as follows. There are two types of politicians, a good type and a bad type. A good type's payoff is aligned, although not completely, with the voter's welfare whereas a bad type only cares about rent. The incumbent politician can appropriate resources for his personal use or invest them in two different projects, a short term and a long term project. The short term project yields output before the election but the benefit from the long term project is realized after the election. Therefore, at the time of election, voters only observe the investment in the short term project. We show that in equilibrium a good type incumbent appropriates less rent but at the same time overinvests in the short term project to signal his type. In the second period, in which there is no electoral concerns, he appropriates more rent but does not distort the investment decision. Hence, the welfare effect is ambiguous. Although the incumbent takes more for his personal use in the second period, he optimally allocates the remaining resources and hence the social welfare may be higher in the second period. This result is in contrast with Banks and Sundaram (1998), in which the principal is always better off in the first period.

The result of this paper provides some implications for the recent debate in Korea over the presidential term limits. In Korea, the president at present cannot serve more than one term. Opponents of the current system argue that the current system fails to provide sufficient incentive to work hard and results in lack of accountability. Hence, they propose that the presidential term limit be extended to two as in the U.S. This paper highlights that the simple argument that the president will work harder in the presence of electoral concerns may not be well founded; he may work harder in the sense that he appropriates less rent but he may distort policy choice to win the election and remain in office. Overall, it is not clear at least theoretically which effect dominates.

The remainder of this paper is organized as follows. Before we move to Section 2, where we present the model, we briefly review related literature. In Section 3, we solve the model and characterize the equilibria of the game. In Section 4, we conduct welfare analysis. We conclude in Section 5.

1.1 Related Literature

Holmstrom (1982) first addresses career concerns issue in managerial context. Gibbons and Murphy (1992), Banks and Sundaram (1998), and Dewatripont *et al*. (1999a, b) further develop this issue theoretically.

There is large literature on policy distortion that career concerns cause. Persson and Svensson (1989) show that faced with an election, a conservative and a progressive government would choose a level of public consumption that is in between the levels the two governments would choose in the absence of career concerns. Grossman and Helpman (1994) investigate an incumbent government's choice of trade policy that arises as a political equilibrium in the presence of special interest groups. Hess and Orphanides (1995) show that under career concerns an incumbent leader with an unfavorable economic performance record may initiate a war to force the learning of his war leadership abilities and thus salvage his reelection. Coate and Morris (1995) investigate the form of transfers to special interests using a signaling game framework. They show that when voters have imperfect information about both the effects of policy and the predispositions of politicians, inefficient methods of redistribution may be employed. Rogoff (1990) analyzes political budget cycles using a model similar to ours. In that paper, however, rent is given exogenously and hence moral hazard problem is not explicitly dealt with. In contrast, we derive the amount of rent endogenously in this paper. We also provide welfare comparison.

Glazer (1989) considers the choice of policy durability problem in a different setting with different meaning of the term 'long-lived project.' Focusing on the uncertainty in collective decision making, he argues that there is a bias toward a durable project.

Our paper is also related to the literature on term limits. Research on term limits grew significantly in the last couple of decades. Most research focuses on legislative term limits and provides rationale for or investigates the consequences of term limits. See López (2003) for a survey. Friedmand and Wittman (1995) and Elhauge (1998), for example, view term limits as a means to reduce interdistrict inequalities in legislative power that arise due to seniority. Dick and Lott (1993) address the paradox that voters reelect their own incumbents and at the same time strongly favor term limits. They suggest that term limits may be a solution to the free rider problem in which voters have an incentive to keep their incumbent although collectively replacing senior politicians with fresh ones will bring about a Pareto improvement. Recently, some papers address term limits in the framework of political accountability. Konrad and Torsvik (1997) suggest that seniority in office gives politicians ability to learn about the bureaucrats' true abilities, which may induce bureaucrats to waste resources to hide their true abilities. Therefore, term limits can be seen as a device for overcoming this problem. Akemann and Kanczuk (2003) construct a model that examines the effect of variations in both term limits and term lengths. They argue that term limits may harm political accountability and competency selection but may also have positive effects by serving as a commitment device not to reelect incumbents. Smart and Strum (2004) argue that term limits can be welfare-improving by reducing the value of holding office and thereby inducing truthful behavior by incumbents. In their model, however, the reduced value of holding office is so low that politicians with two-term limits behave truthfully even in the first term. This is at odds with the empirical findings by, for example, Besley and Case (1995) and Johnson and Crain (2004). These studies find that the behavior of politicians who face a binding term limit differs from that of politicians who are able to run again. In our model, the incumbent behaves differently in different terms of tenure.

II. The Model

2.1 Setup of the Model

We consider a two-period model in which a politician in office allocates resources each period. There is an election near the end of the first period where the incumbent competes with a challenger. The incumbent can maintain his office only when he beats the challenger. Politicians come in two types, good and bad, and this is private information. A good type cares about voters' welfare to some extent whereas a bad type only cares about his own rent. Politicians are ex-ante identical; the probability that a politician is a good type is $\lambda \in (0,1)$.

Resources can be allocated across three different uses: personal rent, a short term project and a long term project. The difference between the short and the long term projects lies in the timing of the realization of the return; the return from the short term project is realized before the election whereas that from the long term project is realized after the election.[1] At the time of voting, voters observe the investment in

[1] It would be more natural to assume that the benefits from the long term project are realized in the second period. However, we assume that they are realized in the first period after the election since we are adopting a two-period model and we want to make the resource allocation problem of the policy maker identical across periods. In a two-period model, we cannot have long term projects in the second period if the benefits are realized next period. We could think of the benefits realized after the

the short term project but observe neither the investment in the long term project nor the amount of rent.

2.2 The Politician

Each period, the politician in office is endowed with resources of size 1. Let s, l, and r denote the investment in the short and the long term projects and the amount of rent, respectively. Then, the resource constraint for the politician is

$$s+l+r=1, \quad \text{where} \quad s,l,r \geq 0.$$

Since r is residually determined as $r=1-s-l$ once s and l are set, we will mainly focus on the pairs of (s, l).

Given an allocation (s, l), the utility of a good type politician in that period is given as

$$U_G(s,l)=f(s)+g(l)+u(1-s-l),$$

where f, s, and u are all strictly increasing and strictly concave.[2,3] We also assume that maximizing $U_G(s,l)$ yields an interior solution, i.e., $0<s,l,r<1$. A set of sufficient conditions for this is that

$$\lim_{s\to 0} f'(s)=\lim_{l\to 0} g'(l)=\lim_{r\to 0} u'(r)=\infty; \quad \lim_{s\to 1} f'(s), \quad \lim_{l\to 1} g'(l), \quad \lim_{r\to 1} u'(r)<\infty.$$

In contrast, a bad type only cares about rent. His utility from (s, l) is given by

$$U_B(s,l)=1-s-l.$$

The incumbent politician in the first period, if reelected, serves another term and again allocates resources. If he loses in the election, he ends up with the payoffs from the outside option in the second period, which is $\underline{u_G}$ for a good type and $\underline{u_B}$ for a bad type. In case the incumbent loses, the newly elected politician comes in office and again allocates resources.

election in our model as the present value of the benefits that are realized in the future.

[2] We assume a separately additive utility function for simplicity. The qualitative results of the paper will remain valid for a more general function with some mild restrictions on the function.

[3] There could be many other ways to model different types regarding rent seeking. For example, we could alternatively assume that a good type does not derive any utility from rent. In this paper, we assume that a good type also cares about rent since we are mainly interested in a good type's behavior including rent seeking in equilibrium. In this sense, a good type in the model refers to a 'better type' compared with a bad type.

For later use, we define the following. Let s^* and l^* be the solution to $\max_{s,l} U_G(s,l)$ and let $r^* = 1 - s^* - l^*$. Also let $U_G^* \equiv U_G(s^*, l^*)$. That is, U_G^* is the payoff to a good type politician from his favorite policy choice.

2.3 The Voter

Voters are all identical and hence we assume a representative voter.[4] In each period, he derives utility from the short and the long term projects. The voter's ex post utility that results from the policy choice (s, l) set by the incumbent is[5]

$$V(s,l) = f(s) + g(l).$$

Note that the voter observes only s and not l or r at the election time. Hence, the uncertainty about l is two-fold; the voter knows neither the type of the incumbent nor the amount of rent appropriated by the incumbent.

The voter's voting decision is also influenced by a stochastic preference shock. At the voting stage, voters have preferences for politicians unrelated to policy. Let ε be the incumbent's advantage or disadvantage in popularity over the challenger. The value of ε is unknown at the time of resource allocation; only its distribution is known. This shock reflects the uncertainty inherent in electoral process. We assume that ε is drawn from a continuous and strictly increasing distribution function F and that $E(\varepsilon) = 0$.

Figure 1 summarizes the timing of the events in the first period. Similar events occur in the second period except that there is no election.

III. Equilibrium

3.1 Backward Induction

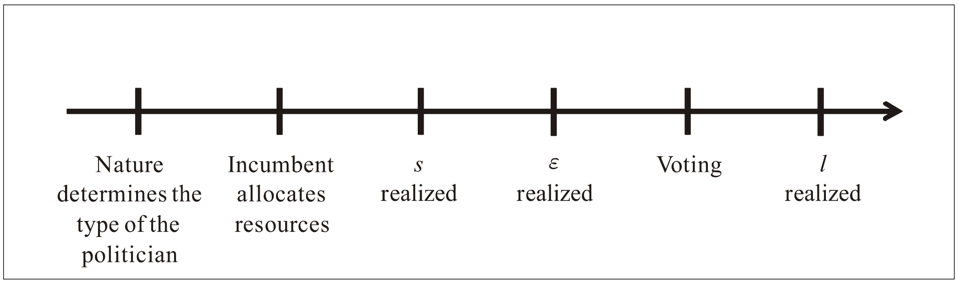
We first investigate the incumbent's decision in the second period. Based on this, we can derive the voter's optimal voting behavior. Then we study our main interest, the incumbent's behavior in the first period, in which he has career concerns. Throughout this paper, we only consider pure strategies.

Whoever comes in office in the second period has no career concerns and hence will always choose his favorite policy. Hence, a good type will choose (s^*, l^*). In contrast, a bad type will choose $(s,l) = (0,0)$, taking everything as rent.

[4] Alternatively, we could think of this voter as a pivotal voter who decides the winner.

[5] This suggests that a good type politician's interest is partially aligned with the voter's welfare.

[Figure 1] Timing of Events in the First Period



At the time of the election, the voter observes only s and ε. Let $\lambda(s)$ be the voter's updated belief about the probability that the incumbent is a good type given s. The voter knows that if a good type comes in office in the second period, he will get $V_G \equiv V(s^*, l^*)$. Likewise, if a bad type comes in office, the voter will get $V_B \equiv V(0,0)$. Since the challenger is ex ante identical to the incumbent and nothing is known about him, the expected payoff to the voter from electing the challenger is $\lambda V_G + (1-\lambda)V_B$, where λ is the ex-ante probability that a politician is a good type. Hence, he will vote for the incumbent if[6]

$$\lambda(s)V_G + (1-\lambda(s))V_B + \varepsilon \ge \lambda V_G + (1-\lambda)V_B,$$

or equivalently, $\varepsilon \ge (\lambda - \lambda(s))(V_G - V_B)$, which occurs with probability

$$1 - F[(\lambda - \lambda(s))(V_G - V_B)].$$

Define

$$p_{\lambda(s)} \equiv 1 - F[(\lambda - \lambda(s))(V_G - V_B)].$$

That is, $p_{\lambda(s)}$ is the probability that the incumbent will win when the updated belief is $\lambda(s)$. Then, $p = p_1$ if the voter is sure that the incumbent is a good type, $p = p_\lambda$ if the voter's prior belief is maintained, and $p = p_0$ if the voter is sure that the incumbent is a bad type.

We are now ready to analyze the incumbent's choice in the first period. Before we proceed, however, it should be noted that when the incumbent chooses s in the first period, his choice of l and r should be optimal. That is, given his choice s, the choice of l and r should be such that it maximizes his payoff subject to the constraint that the investment in the short term project is s. For a good type,

[6] We assume that the voter votes for the incumbent when indifferent. Assuming otherwise would not change the result.

denote the optimal value of l by $l(s)$. That is, $l(s)$ is the solution to

$$\max_{l} f(s)+g(l)+u(1-s-l)$$

for a given s. Now define $U(s)$ as

$$U(s) \equiv U_G(s,l(s)).$$

That is, $U(s)$ is the payoff to a good type when he chooses the optimal l for a given s. The choice of a bad type is straightforward. For any s, his optimal choice is $l=0$ and $r=1-s$ since his utility depends only on rent.

In the next subsection, we will first consider separating equilibria, in which different types choose different resource allocation. Then we will consider a case in which the two types pool on the same choice.

3.2 Separating Equilibria

Let s_G and s_B denote the investment in the short term project made by a good and a bad type, respectively. We consider a case in which $s_G \neq s_B$. The belief consistent with this is $\lambda(s_G)=1$ and $\lambda(s_B)=0$. Given $\lambda(s_B)=0$, then, it should be that $s_B=0$ since in equilibrium the type of a bad politician will be revealed anyway. Regarding the off-equilibrium beliefs, we let $\lambda(s)=0$ for $s \neq s_G$, 0.

Now think about the conditions under which such a separating equilibrium may exist. For a good type to choose s_G, the resulting payoff should be no smaller than that from his most profitable deviation, which is (s^*,l^*) given $\lambda(s)=0$ for $s \neq s_G$. Therefore, for a good type to choose s_G, we should have

$$U(s_G)+p_1U_G^*+(1-p_1)\underline{u_G} \geq U_G^*+p_0U_G^*+(1-p_0)\underline{u_G},$$

or equivalently

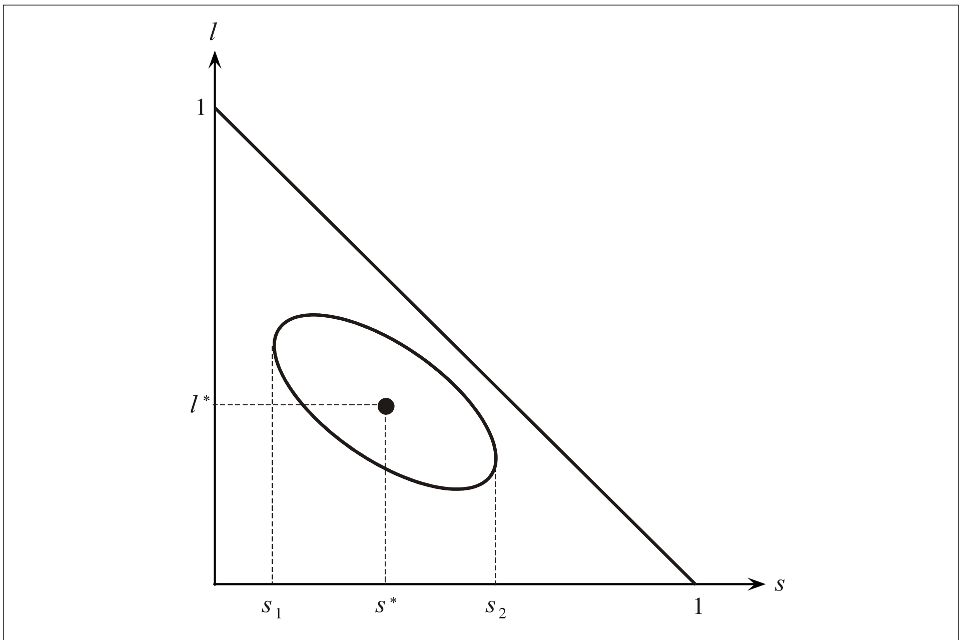
$$U(s_G) \geq U_G^* -(p_1-p_0)(U_G^* - \underline{u_G}). \tag{1}$$

This condition implies that s_G should not be too costly for a good type to use as a signal. Since $U_G(s,l)$ is strictly concave and hence strictly quasi-concave, the set of pairs (s,l) that satisfy the following inequality is a convex set.

$$U_G(s,l) \geq U_G^* -(p_1-p_0)(U_G^* - \underline{u_G}).$$

In terms of s_G, this implies that the set of s_G that satisfies (1) is a closed interval.[7] Let s_1 and s_2 be the minimum and maximum of s in the set.[8] See Figure 2.

[Figure 2] A Good Type in Separating Equilibria



Now consider a bad type. For a bad type not to mimic a good type and stick with $s=0$, the following should hold:

$$1+p_0\cdot 1+(1-p_0)\underline{u_B} \geq 1-s_G+p_1\cdot 1+(1-p_1)\underline{u_B}\ ,$$

which is equivalent to

[7] Alternatively, we can get the same conclusion by showing that $U(s)$ is strictly concave in s. From

$$U(s)=f(s)+g(l(s))+u(1-s-l(s))\ ,$$

we have

$$\begin{aligned} U'(s) &= f'(s)+g'(l(s))l'(s)-u'(1-s-l(s))\cdot(1+l'(s)) \\ &= f'(s)-u'(1-s-l(s))+l'(s)\left\{g'(l(s))-u'(1-s-l(s))\right\} \\ &= f'(s)-u'(1-s-l(s))\ , \end{aligned}$$

which we can directly get by applying the envelope theorem.

Hence,

$$U''(s)=f''(s)+u''(1-s-l(s))\cdot(1+l'(s))<0$$

since $l'(s)<-1$ as will be shown later in the paper.

[8] We will think about the curvature of the ellipses in Section 4.

$$s_G \geq (p_1 - p_0)(1 - \underline{u_B}). \tag{2}$$

This condition implies that s_G should be significantly bigger than 0 to prevent a bad type from mimicking a good type. Let $s_3 = (p_1 - p_0)(1 - \underline{u_B})$.

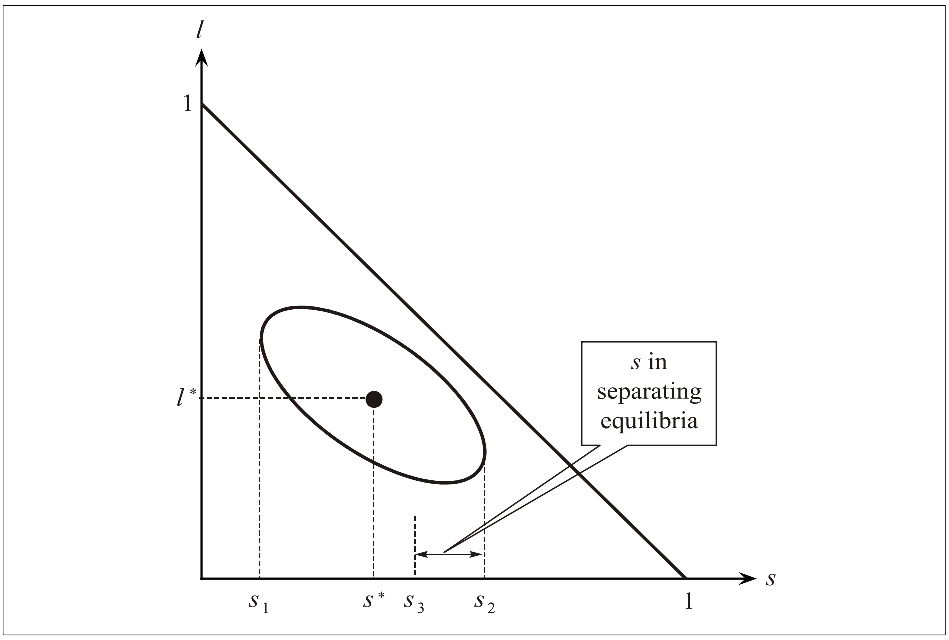
Separating equilibria exist only if (1) and (2) are satisfied together. In other words, separating equilibria exist only if $s_3 \leq s_2$. If this condition is not satisfied, a bad type can always mimic a good type and hence separating cannot occur. We will further assume the following:

Assumption 1

$$s^* < s_3 < s_2$$

The second inequality $s_3 < s_2$ is needed for the existence of separating equilibria as explained above. We assume the first inequality $s^* < s_3$ to make our problem more realistic and interesting. Suppose $s^* \geq s_3$ to the contrary. Then, a good type could always choose his favorite polity s^* and still successfully reveal his type, which makes the problem not only unrealistic but also uninteresting. The above assumption basically implies that in equilibrium, a good type would have to depart from his unconstrained best choice to signal his type. Figure 3 illustrates a case where Assumption 1 is satisfied.

[Figure 3] Separating Equilibria



It is straightforward that any $s_G \in [s_3, s_2]$ will work for a good type. Hence, we obtain the following result.

Proposition 1 *Under Assumption 1, the following strategies and beliefs constitute separating equilibria of the game:*

$$s_G \in [s_3, s_2], \quad s_B = 0; \quad \lambda(s_G) = 1, \quad \lambda(s) = 0 \ \textit{for all} \quad s \neq s_G .$$

There exist a continuum of equilibria. Note that in equilibrium, a good type politician directs more resources towards the short term project than he would in the absence of the election. We are mainly interested in the effect of this on the voter's welfare. We will turn to this issue in the next section.

Regarding the multiplicity of equilibria, if we further impose the Intuitive Criterion by Cho and Kreps (1987) as a refinement device, we can obtain a unique equilibrium, in which $s_G = s_3$. The logic for this is similar to that for the 'Riley (1979) outcome' in the job market signaling by Spence (1973). To see this, fix $s_G \in (s_3, s_2]$ and consider a deviation $s'_G \in (s_3, s_G)$. Since this deviation satisfies (2), a bad type will never choose such an s'_G even if it makes the voter believe that he is a good type. However, a good type would be willing to choose such an s'_G if it still convinces the voter that he is a good type since s'_G is closer to s^* than s_G is. Therefore, the reasonable belief when observing $s'_G \in (s_3, s_G)$ is $\lambda(s'_G) = 1$ but this is inconsistent with the belief system in the equilibrium above, i.e., $\lambda(s) = 0$ for all $s \neq s_G$. The only case in which this does not occur is when $s_G = s_3$. We will mainly focus on this Riley outcome in Section 4 when we conduct welfare analysis.

3.3 Pooling Equilibria

Now consider a case in which $s_G = s_B = s_p$. Since different types pool on the same signal, the prior belief is maintained and hence $\lambda(s_p) = \lambda$. For $s \neq s_p$, let $\lambda(s) = 0$.

Now think about the conditions under which a pooling equilibrium may exist. For a good type to pool on s_p, the payoff from s_p should be no smaller than the payoff from the most profitable deviation, which is (s^*, l^*) given $\lambda(s) = 0$ for $s \neq s_p$. Then, we should have

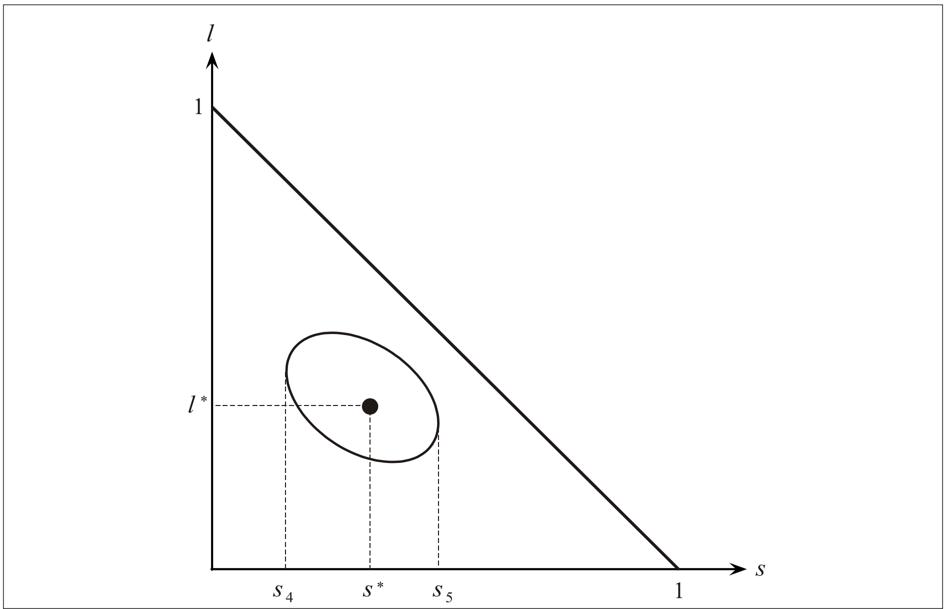
$$U(s_p) + p_\lambda U_G^* + (1 - p_\lambda)\underline{u_G} \geq U_G^* + p_0 U_G^* + (1 - p_0)\underline{u_G} ,$$

which is equivalent to

$$U(s_p) \geq U_G^* - (p_\lambda - p_0)(U_G^* - \underline{u_G}) . \tag{3}$$

This condition implies that s_p should not be too costly, i.e., it should not be too far from s^*.[9] Let s_4 and s_5 be the minimum and maximum s_p that satisfy (3), respectively. See Figure 4.

[Figure 4] A Good Type in Pooling Equilibria



Now consider a bad type. The most profitable deviation for a bad type would be $s = l = 0$ and $r = 1$. For a bad type to choose s_p, therefore, we should have

$$1 - s_p + p_\lambda \cdot 1 + (1 - p_\lambda)\underline{u_B} \geq 1 + p_0 \cdot 1 + (1 - p_0)\underline{u_G},$$

or equivalently

$$s_p \leq (p_\lambda - p_0)(1 - \underline{u_B}). \tag{4}$$

Just like for a good type, this condition implies that choosing s_p should not be too costly for a bad type.[10] Let $s_6 = (p_\lambda - p_0)(1 - \underline{u_B})$.

Pooling equilibria may exist only when both (3) and (4) are satisfied, i.e., when $s_6 \geq s_4$.[11] Figure 5 illustrates such a case.

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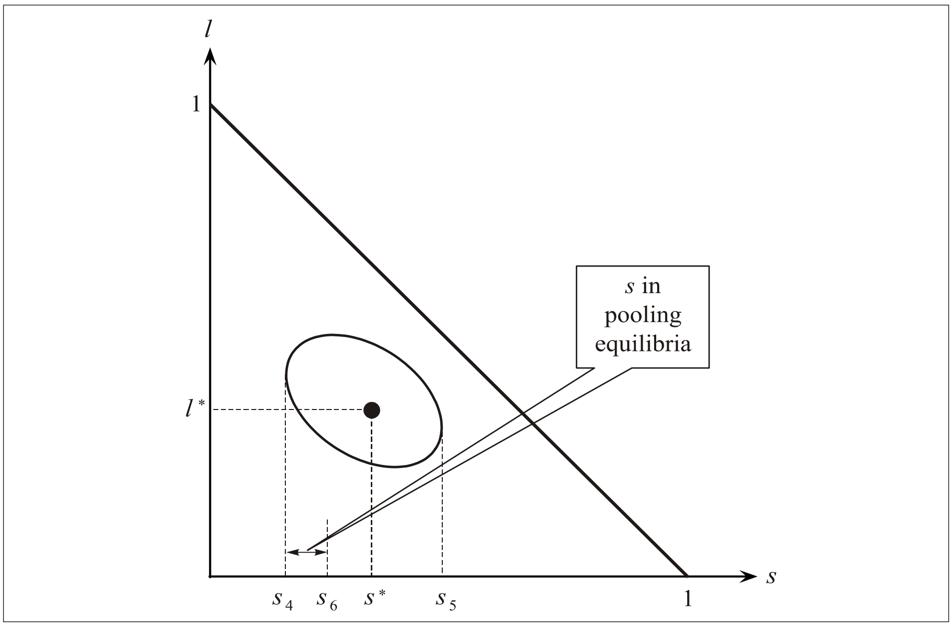
[9] Notice that the right hand side of (3) is bigger than that of (1), which means that (3) is stricter than (1).

[10] Notice that the right hand side of (4) is smaller than that of (2).

[11] Note that Assumption 1 does not guarantee this.

[Figure 5] Pooling Equilibria



We have the following result.

Proposition 2 *Pooling equilibria exist when* $s_6 \geq s_4$. *In a pooling equilibrium, the following holds:*

$$s_G = s_B = s_p \in [s_4, s_6]; \quad \lambda(s_p) = \lambda, \quad \lambda(s) = 0 \;\; \textit{for all} \;\; s \neq s_p.$$

In any pooling equilibria, a bad type directs more resources to the short term project than he would in the absence of career concerns. How a good type's investment in the short term project compares with s^*, his choice in the absence of election, depends on whether $s_p > s^*$ or $s_p < s^*$.

We could refine the set of equilibria by requiring the Intuitive Criterion as we did for the separating equilibria. We show in the Appendix that under fairly mild conditions, no pooling equilibria pass the Intuitive Criterion.

Lastly, note that since $s_6 < s_3$, the sets of s in the separating and pooling equilibria are disjoint.[12] That is, the same signal cannot be used both in separating and pooling equilibria.

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[12] Note that $s_3 - s_6 = (p_1 - p_0)(1 - \underline{u_B}) - (p_\lambda - p_0)(1 - \underline{u_B}) = (p_1 - p_\lambda)(1 - \underline{u_B}) > 0$.

IV. Welfare Analysis

We found in Section 3 that the incumbent's behavior is affected by the election. In the separating equilibria, a good type directs more resources to the short term project than he would in the absence of an election. In the pooling equilibria, both types are affected by the election; compared with the choice in the absence of career concerns, a bad type directs more resources to the short term project whereas a good type's choice depends on whether $s_p > s^*$ or $s_p < s^*$.

In any case, it is true that in either type of equilibria, at least one type is affected by the election. We are mainly interested in how the voter's welfare is affected by the politician's choice. Presumably, there are two mixed effects. On one hand, it may benefit the voter as politicians would decrease his rent and direct more resources to the public projects. On the other hand, the composition of the investments may not be optimal since the politician may distort resource allocation to signal his type.

To analyze such mixed effects formally, we have to choose a specific equilibrium outcome from Section 3. Throughout this section, we will work with the Riley outcome of the separating equilibria. That is, we will analyze the equilibrium in which $s_G = s_3$ and $s_B = 0$. However, the qualitative result in this section will continue to hold for other equilibria as well since they also involve similar type of distortion in resource allocation.

In this section, we will consider two issues with regard to the voter's welfare. First, we will consider the payoff profile generated by the politician who serves both periods. Specifically, we will see whether the payoff to the voter generated by a good type politician improves or declines over time. Second, using the result about the payoff profile, we will consider the implication of the model for term limits.

4.1 Payoff Profile

In the separating equilibrium that we focus on in this section, a bad type who wins the election chooses $r = 1$ in both periods and therefore the payoff to the voter is trivially the same across periods. Thus, a more interesting question is whether the voter is made better off or worse off over time as a good type politician wins the election and hence remains in office in the second period.

In the separating equilibrium, the payoff to the voter in the first period is

$$V_1 \equiv f(s_3) + g(l(s_3)). \tag{5}$$

In the second period, the payoff is

$$V_G = f(s^*) + g(l^*).$$

Notice that (5) is closely related to the incumbent's maximization problem subject to the constraint $s = s_3$. Fix s and consider the following maximization problem:

$$\max_{l} f(s) + g(l) + u(1 - s - l)$$

The first order condition gives

$$g'(l) - u'(1 - s - l) = 0.$$

This condition implicitly defines the optimal l as a function of s. By the implicit function theorem, we obtain

$$\frac{dl}{ds} = -\frac{u''}{g'' + u''}. \tag{6}$$

Note that $dl/ds < 0$ and $0 < |dl/ds| < 1$. This implies that the optimal value of l decreases as s increases and that the absolute value of the slope of the optimal path of l is less than 1. Also notice that both (s^*, l^*) and $(s_3, l(s_3))$ are on this path. Since $s_3 > s^*$, it follows that $s_3 + l(s_3) > s^* + l^*$, which means that more resources are directed to public projects in the first period than in the second period. More formally, since

$$\frac{d}{ds}(s + l(s)) = 1 + \frac{dl}{ds} = 1 - \frac{u''}{g'' + u''} = \frac{g''}{g'' + u''} > 0$$

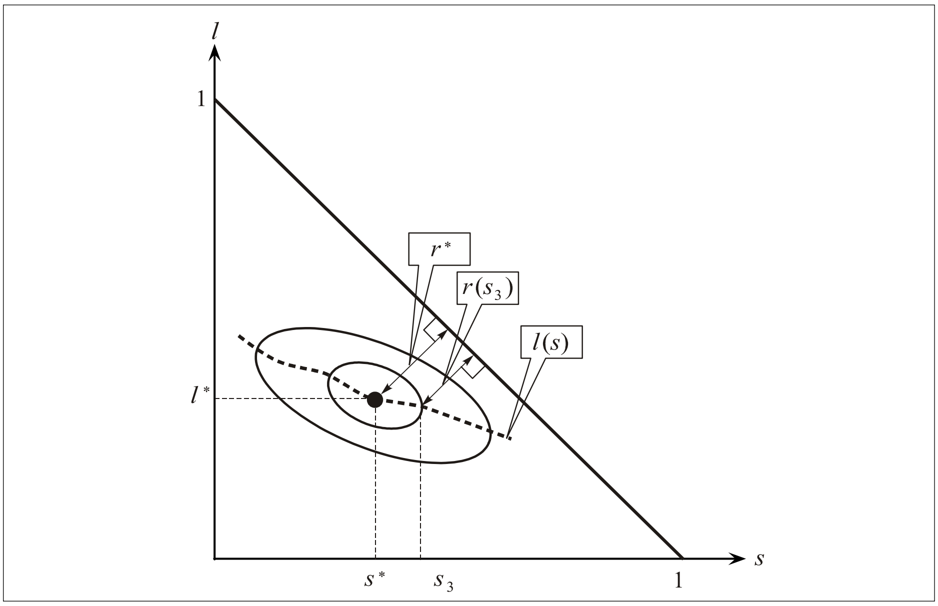
and $s_s > s^*$, it straightforwardly follows that

$$s_3 + l(s_3) > s^* + l^*.$$

Equivalently, this means that the rent is smaller in the first period than in the second period, i.e., $r(s_3) < r^*$. See Figure 6.

The above discussion implies that the incumbent works harder in the presence of the voter's monitoring in the sense that he allocates more resources to the public projects in the first period. However, this does not guarantee that the voter is better off in the first period. It is true that the incumbent appropriates less rent in the first period, but the problem is that the remaining resources are not allocated optimally from the viewpoint of the voter; the incumbent directs resources to the short term project beyond the optimal level. In the second period, in contrast, the politician takes more resources as rent but the remaining resources are allocated optimally.

[Figure 6] Rents in the Two Periods



To see this more explicitly, think about the relation between s and the optimal l for the voter given r. Fix r and consider the following problem:

$$\max_s f(s) + g(1-s-r)$$

The first order condition yields

$$f'(s) - g'(1-s-r) = 0.$$

By the implicit function theorem, we obtain

$$\frac{dr}{ds} = \frac{f'' + g''}{g''}$$

Hence,

$$\frac{dl}{ds} = \frac{d(1-s-r)}{ds} = -1 - \frac{dr}{ds} = -1 + \frac{f'' + g''}{g''} = \frac{f''}{g''} > 0. \quad (7)$$

Notice that (s^*, l^*) is on this path but $(s_3, l(s_3))$ is not.[13] Hence, although more

[13] In fact, (s^*, l^*) is the intersection of the two paths defined by (6) and (7) since (s^*, l^*) is the

resources are taken as rent in the second period, the remaining resources are allocated optimally from the viewpoint of the voter's welfare. In the first period, however, more resources are put to the public project but the allocation of resources is distorted.

Overall, the effect of the political accountability generated by the election on the voter's payoff is ambiguous. In fact, it turns out that when s_3 is very close to s^*, the voter is better off in the first period than in the second period, whereas the comparison is ambiguous if s_3 is significantly bigger than s^*. Formally, we have the following.

Proposition 3 For s_3 close to s^*, we have $V_1 > V_G$.

Proof. Define $\tilde{V}(s) = f(s) + g(l(s))$. Then,

$$\frac{d\tilde{V}}{ds}\Big|_{s=s^*} = f'(s^*) + g'(l(s^*))\frac{dl}{ds}.$$

Since s^* and l^* solve

$$\max_{s,l} f(s) + g(l) + u(1-s-l),$$

it follows that $f'(s^*) = g'(l^*)$. Since $l^* = l(s^*)$, it follwos that $f'(s^*) = g'(l(s^*))$. Therefore,

$$\frac{d\tilde{V}}{ds}\Big|_{s=s^*} = f'(s^*)\left(1+\frac{dl}{ds}\right) = f'(s^*)\left(1-\frac{u''}{g''+u''}\right) = f'(s^*)\frac{g^n}{g''+u''} > 0. \quad \blacksquare$$

Intuitively, the indifference curve of the voter is tangent to the 'budget line' $s + l = 1 - r^*$ at (s^*, l^*) since (s^*, l^*) is the choice that maximizes the voter's payoff given $r = r^*$. Also note that the voter's indifference curves show diminishing MRS since $V(s,l) = f(s) + g(l)$ and f and g are concave. Finally, $0 < |dl/ds| < 1$. Therefore, the curve $l(s)$ cuts through the voter's indifference curve that goes through (s^*, l^*) and hence $V_1 > V_G$ if s_3 is close to s^*. However, if s_3 is much bigger than s^*, there is no such guarantee. Figure 7 illustrates cases where the voter's welfare is higher in the first period (point A) and the second period (point B), respectively.

The above result shows that if the policy distortion caused by the election is small, then voters benefit from it. If the distortion is big, however, voters may be better off

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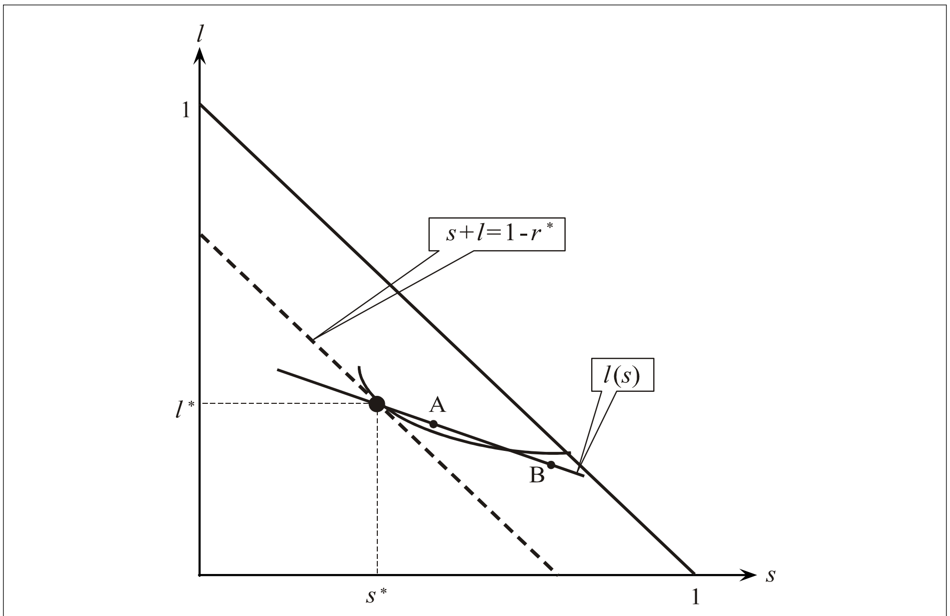
solution to the unconstrained maximization problem.

when politicians face no electoral concerns.

[Figure 7] Payoff Profiles



Hence, our model has a welfare implication that is in contrast with the result by Banks and Sundaram (1998). In their work, the productivity of an agent retained by the optimal cut-off rule necessarily declines over time. Our result indicates the possibility that if there are multiple tasks and if the output of some of them are unobservable at the time of screening, the productivity of an agent who survives the test may improve over time.

4.2 Term Limits

The behavior of the incumbent in our model can be thought of as that of a politician with two-term limits. One interesting question in our setting is whether two-term limits are superior to one-term limits. Let's first consider the ex ante equilibrium payoff over the two periods in our model, denoted by W_{2TL}, which can be regarded as the expected payoff to the voter under two-term limits:

$$\begin{aligned} W_{2TL} = &\lambda\left\{V_1 + p_1 V_G + (1-p_1)(\lambda V_G + (1-\lambda)V_B)\right\} \\ &+(1-\lambda)\left\{V_B + p_0 V_B + (1-p_0)(\lambda V_G + (1-\lambda)V_B\right\}. \end{aligned}$$

Rearranging this, we get

$$
\begin{aligned}
W_{2TL} &= \{\lambda V_1 + (1-\lambda)V_B\} \\
&\quad + \lambda(p_1 V_G + (1-p_1)(\lambda V_G + (1-\lambda)V_B)) \\
&\quad + (1-\lambda)(p_0 V_G + (1-p_0)(\lambda V_G + (1-\lambda)V_B)) \\
&= W_1 + W_2,
\end{aligned}
$$

where $W_1 = \lambda V_1 + (1-\lambda)V_B$, the expected payoff to the voter in the first period, and $W_2 = W_{2TL} - W_1$, the expected payoff to the voter in the second period.

If the politician cannot serve more than one term, in contrast, the ex ante payoff over the two periods will be

$$W_{1TL} \equiv 2\{\lambda V_G + (1-\lambda)V_B\} = 2W_m,$$

where $W_m = \lambda V_G + (1-\lambda)V_B$, the expected payoff to the voter from a randomly selected politician. This occurs because under one-term limits, ex ante identical politicians will be in office and behave in an unconstrained manner.

Note that $W_2 > W_m$.[14] Intuitively, this is because two-term limits have a 'selection effect.' Under two-term limits, a bad type loses the election with higher probability than a good type does; therefore, the policy maker in the second period is more likely to be a high type under two-term limits than under one-term limits. However, it is not clear whether W_1 is bigger or smaller than W_m. Suppose, for example, that $V_1 > V_G$. Then, obviously $W_{2TL} > W_{1TL}$ since $W_1 > W_m$ and $W_2 > W_m$. This occurs when the effect of the election on the politician's choice in the first period turns out to be beneficial to the voter. Even when $V_1 < V_G$, we may have $W_{2TL} > W_{1TL}$ as long as V_1 is not too small; if the selection effect in the second period more than compensates the policy distortion in the first period, two-term limits may be better than one-term limits. If the distortion is huge, however, one-term limits may be better than two-term limits. We have the following result:

Proposition 4 *There exists a cutoff value $V_c < V_G$ such that two-term limits are superior to one-term limits if and only if $V_1 > V_c$.*

Proof. It can be shown that

$$W_{2TL} - W_{1TL} = \lambda\{V_1 - V_G + (1-\lambda)(p_1 - p_0)(V_G - V_B)\}. \tag{8}$$

Define $V_c \equiv V_G - (1-\lambda)(p_1 - p_0)(V_G - V_B)$. Then $W_{2TL} > W_{1TL}$ if and only if $V_1 > V_c$. ■

[14] It can be easily shown that
$$W_2 - W_m = \lambda(1-\lambda)(p_1 - p_0)(V_G - V_B) > 0.$$

One could also think about the comparison of the two systems with respect to λ, which represents the general quality of politicians. The effects of change in λ on W_{2TL} and W_{1TL} are complicated, however, since λ affects W_{2TL} and W_{1TL} not only directly but also through p_1 and p_0. To single out its direct effect, let's assume that $p_1 - p_0$ does not depend on λ. Furthermore, we assume that $p_1 - p_0$ is not too small. Then, we obtain the following result.

Proposition 5 *Suppose* $V_G > V_1$ *and assume that* $p_1 - p_0$ *does not depend on* λ *and bigger than* $(V_G - V_1)/(V_G - V_B)$. *Then, there exists a cutoff* $\lambda_c \in (0,1)$ *such that two-term limits are superior to one-term limits for* $\lambda < \lambda_c$.

Proof. Let $p_1 - p_0 = k > 0$. Define

$$\Delta W(\lambda) = W_{2TL} - W_{1TL} = \lambda\{V_1 - V_G + (1-\lambda)k(V_G - V_B)\}$$

for $\lambda \in (0,1)$. Trivially, $\Delta W(0) = \Delta W(1) = 0$ since there is no signalling issue when $\lambda = 0$ or 1. For $\lambda \in (0,1)$, it follows that

$$\Delta W'(\lambda) = V_1 - V_G + (1-\lambda)k(V_G - V_B) - \lambda k(V_G - V_B) \text{ and}$$
$$\Delta W''(\lambda) = -2k(V_G - V_B) < 0.$$

Hence, $\Delta W(\lambda)$ is strictly concave in λ. Also notice that $\Delta W(\lambda)$ is continuous in λ for $\lambda \in (0,1)$ and

$$\lim_{\lambda \to +0} \Delta W(\lambda) = \Delta W(0) = 0 \quad \text{and} \quad \lim_{\lambda \to 1-0} \Delta W(\lambda) = V_1 - V_G < 0 = \Delta W(1).$$

Moreover,

$$\lim_{\lambda \to +0} \Delta W'(\lambda) = V_1 - V_G + k(V_G - V_B) > 0.$$

Therefore, there exists a unique $\lambda_c \in (0,1)$ such that $\Delta W(\lambda_c) = 0$ and hence we have

$$W_{2TL} \gtreqless W_{1TL} \text{ for } \lambda \lesseqgtr \lambda_c. \quad \blacksquare$$

Intuitively, two-term limits will be better when politicians are likely to be poor because then the selection effect under two-term limits will come useful. Notice, however, that the above proposition only holds when $p_1 - p_0$ does not depend on λ; that is, it deals with a case in which the indirect effect of λ on W_{2YL} and

W_{1TL} is very weak. If the assumption is not satisfied, more than one cutoff point may exist and hence the comparison will depend on the specific interval that λ falls into. Also notice that two-term limits are superior to one-term limits regardless of λ if $V_1 > V_G$.

V. Conclusion

In this paper, we show that in the presence of career concerns, politicians may work harder but at the same time may distort policy choice. The novelty of this paper is that we take both adverse selection and moral hazard into account in a multiple-task setting. Banks and Sundaram (1998) show that under the cut-off retention rule, agents who survive work harder in the first period and hence the principal is better off in the first period. This is the case since there is only one task and all the actions taken by the agent are observable. We show that this result may not hold if there are more than one task and some of them are not observable; the welfare effect of career concerns can go either way. Our discussion of term limits also shows that the simple argument that having the president face electoral concerns is socially beneficial since it will induce more efforts from the president may be misguided.

Our model is based on some simplifying assumptions: two discrete types of incumbents, no uncertainty in the output of the projects, identical voters, to name a few. We could, for example, assume a continuum of politician types and heterogeneity in voters and make the output of the projects influenced by the state of the world, which will make the model more realistic. However, generalization in these directions will not affect the results qualitatively and the main message of this paper will still remain valid.

Our discussion of term limits is very primitive and leaves much to be pursued. One of the interesting questions to be answered is about the different term limits for different offices. In Korea, for example, the president can serve only one term whereas provincial governors and mayors have three-term limits and lawmakers face no term limits. Exploring the rationale for this difference or evaluating the current system in terms of welfare will make an important and interesting research agenda.

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Appendix: Pooling Equilibria and the Intuitive Criterion

Fix a pooling equilibrium with $s_G = s_B = s_p$. Suppose that if a good type deviates to $s'_G > s_p$, then the voter somehow believes that he is a good type with certainty. Moreover, suppose a good type is indifferent between pooling on s_p and deviating to s'_G and thereby winning with probability p_1. Then, we have

$$U(s'_G) + p_1 U^*_G + (1-p_1)\underline{u_G} = U(s_p) + p_\lambda U^*_G + (1-p_\lambda)\underline{u_G}.$$

Similarly, suppose that a bad type can win with probability p_1 if he deviates to $s'_B > s_p$ and he is indifferent between this deviation and pooling on s_p. Then, we have

$$1 - s'_B + p_1 \cdot 1 + (1-p_1)\underline{u_B} = 1 - s_p + p_\lambda \cdot 1 + (1-p_\lambda)\underline{u_B}.$$

Now assume that (i) $s'_G \neq s'_B$ and (ii) min $\{s'_G, s'_B\} \leq 1$.

Then we can show that no pooling equilibria pass the Intuitive Criterion. Suppose $s'_G < s'_B$ and consider a deviation to $s' \in (s'_G, s'_B)$. A good type will never deviate to such an s' because he would be strictly worse off than under s_p even if choosing s' induces the voter to believe that the politician is certainly a good type. However, a bad type would be willing to choose s' if it makes the voter believe that he is a good type with probability 1. This means that s' is equilibrium dominated for a good type but not for a bad type and hence the reasonable belief is $\lambda(s') = 0$. But this is not consistent with the belief $\lambda(s) = 0$ for $s \neq s_p$.

If $s'_B < s'_G$, in contrast, it is straightforward that the opposite is true. Any $s' \in (s'_B, s'_G)$ is equilibrium dominated for a bad type but not for a good type and hence the reasonable belief is $\lambda(s') = 1$, which again is inconsistent with $\lambda(s) = 0$ for $s \neq s_p$. Therefore, no pooling equilibria pass the Intuitive Criterion.