Civil Service Reform*

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Abstract

Civil service rules governing the selection and motivation of bureaucrats are among the defining institutions of modern democracies. Although this is an active area of reform in the US and elsewhere, economic analyses of the issue are virtually nonexistent. This paper provides a welfare evaluation of civil service reform. It describes the effect of reform on the interaction of politicians, voters, and bureaucrats, and shows that society often faces trade-offs between improving the bureaucracy or improving the performance of politicians. My results characterize the conditions under which merit-based recruitment and civil service protections such as tenure can improve welfare.

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1 Introduction

Laws governing the merit-based selection and compensation of bureaucrats and their protection from political pressure are commonly viewed as a staple of a well-functioning democracy. Because bureaucrats protected from politics may also be less responsive to legitimate policy directives, the optimal structure of civil service laws is a nontrivial problem of institutional design. As a result, rules governing the operation of bureaucracies have been an active area of institutional reform in the US and around the world.[1] By this measure, the importance of civil service laws rivals that of electoral rules (e.g., districting, campaign finance) and political decision-making rules (e.g., super-majority requirements, line-item veto powers). But while the latter have been subjected to extensive economic analysis,[2] little is known about the impact of civil service reform.

This paper presents a theoretical analysis of civil service laws. At their core, these laws govern (i) the selection of bureaucrats, typically through competitive examinations, and (ii) the degree of control that politicians can exercise over them, which can be limited through civil service protections such as standardized pay scales and job tenure. While in practice laws have other details, understanding the two core mechanisms of selection and control is an important first step towards a better understanding of this institution. In the US federal government, the Pendleton Act of 1883 codified the selection of bureaucrats based on merit (professional qualifications), and this principle has rarely been questioned since. The desirable level of control has been more controversial, and while the Pendleton Act aimed at reducing control, more recent reforms beginning with the Civil Service Reform Act of

[1] Between 1981 and 1991, civil service reforms were a component in 90 World Bank loans to 44 different countries totalling over $ 4.6 billion (Lindauer and Nunberg, 1996). Every US president in the 20th century had a government reorganization program with personnel implications near the top of his reform agenda (see OPM (2003) for a history of federal reform proposals). State governments are also active reformers. Contentious legislation in Georgia (1996), Florida (2001), and Arizona (2012) ended traditional civil service protections, including tenure, for a substantial number of state employees. In 2011 pay-setting procedures were in the spotlight after a series of states, led by Wisconsin, repealed the collective bargaining rights of public employees.

[2] See Besley and Case (2003) for a survey of the literature on the policy effects of electoral and decision-making rules in US states.

1978 increased control and reduced bureaucrats' protections.[3] The analysis presented here describes the conditions under which these types of reforms are desirable. It shows that the selection and control of bureaucrats can interact in subtle ways with the electoral process, affecting not just what bureaucrats do, but also which politicians get elected and the policies they choose once in office. In particular, society will often face a trade-off between improving the bureaucracy or improving the performance of politicians.

My results are based on three broad ideas concerning civil service reform. First, civil service rules can interfere with the ability of elections to discipline politicians. This is because bureaucrats affect a politician's payoff from holding office, and therefore the value of being reelected. If a politician gets lower utility from working with a better bureaucracy, then improving the bureaucracy lowers his value of reelection, and hence his incentive to choose policies that benefit voters. For example, a "corrupt" mayor may carry out socially beneficial policies as long as being surrounded by loyal (corrupt) bureaucrats makes reelection worthwhile. Civil service reform can reduce bureaucratic corruption either through better selection (if more honest bureaucrats are hired) or reduced control (if bureaucrats become more honest once they are protected from the mayor). This can lower the mayor's utility from holding office, and cause him to abandon the beneficial policies. The more corrupt the politician (i.e., the more he needs elections to remain honest), the more his incentive to choose good policies is likely to decrease when the bureaucracy improves.

Second, civil service rules can interfere with the ability of elections to screen politicians. This is due to bureaucrats' role in transmitting information between politicians and voters. Voters need information on the actions of politicians to hold them accountable, but they rarely observe directly what happens in the legislature or in the White House, much less what happens in a governor's or a mayor's office. What they typically see are the actions of bureaucrats, and they judge politicians based on the policies as implemented by these bu-

[3] This parallels the history of the British civil service, where the initial emphasis on selection and reduced control beginning in the mid-19th century was followed by reforms towards increased control initiated by the Thatcher government in the 1970s.

reaucrats.[4] Improving the bureaucracy is likely to make its actions less informative regarding the behavior of politicians. For example, a bureaucrat who always awards procurement contracts to the lowest bidder is less informative to voters than one who awards the contract to the politician's cousin when asked to do so. An honest bureaucrat makes it harder for voters to throw corrupt politicians out of office. Thus, improving the bureaucracy can lower the quality of incumbent politicians.

Finally, civil service protections such as tenure remove the alignment between bureaucrats' and politicians' incentives and this can have socially undesirable consequences. Without tenure a bureaucrat who wants to keep his job needs the politician to be reelected, with tenure he does not. A tenure system can result in strategic behavior by the bureaucrat: when he learns that the politician does not share his preferences, he can lower his reelection chances by implementing bad policies. Thus, tenured bad bureaucrats can sabotage good politicians without having to worry about losing their jobs.[5] Similarly, tenured good bureaucrats have less reason to protest against bad policies that will get a bad politician thrown out of office.

I study these ideas in a simple political agency model with voters, politicians, and bureaucrats.[6] In the model, policies are chosen by politicians but implemented by bureaucrats, and bureaucrats can decide not to comply with the politician's choice. Noncompliant bureaucrats may be punished, capturing the politician's degree of control over the bureaucracy. Politicians as well as bureaucrats can have preferences aligned with voters' ("good") or misaligned with voters' ("bad"). Voters observe implemented policies, attempt to infer the quality of

[4] This seems well understood by the mayors interviewed by Tolchin and Tolchin (1971), who complained that voters hold them responsible for the policies implemented by bureaucrats who have a large degree of discretion. "Adding to their difficulties as mayor is the public belief that they do command, causing the shower of blame which inevitably rains on them when services fail to run optimally." (p73).

[5] Indeed, politicians often worry that bureaucrats protected by tenure will have electoral costs for them. As Roosevelt "kingmaker" James A. Farley noted: "Some of the greatest troubles the President has had were caused by subordinate officials who were in sharp disagreement with his policies and, rightly or wrongly, were sabotaging the job he was trying to accomplish." (quoted in White and Smith, 1939, p92).

[6] This model is one of the few existing attempts to understand the "multilayered agency problem between voters, politicians, and bureaucrats which has not been studied extensively in the agency model." (Besley, 2006, p232)

both the politician and the bureaucrat, and decide whether to reelect the politician. Section 3 presents the simplest version of the model, where in each period the politician interacts with a bureaucrat randomly chosen from a large bureaucracy. In Section 4 bureaucrats "live" for two periods, engage in forward-looking strategic behavior, and the politician has the option to fire them. Section 5 studies various other extensions.

The results help rationalize various aspects of real-world civil service reforms. I find that lowering politicians' control over bureaucrats is beneficial if politicians' quality is low *and* elections are ineffective at disciplining them, which is in line with the views commonly held by reformers in the Progressive era. My results also explain why it is important to pair reduced control with improved selection that raises the quality of bureaucrats. This provides a rationale for early US reforms emphasizing merit-based recruitment. However, unless the quality of bureaucrats can be improved substantially, improving the bureaucracy can lead to lower welfare because this makes it harder for voters to discipline and screen bad politicians. When the quality of bureaucrats is low, giving politicians more control can raise welfare, in line with provisions of the Civil Service Reform Act and other recent reforms aimed at increasing the responsiveness of the bureaucracy. Interestingly, I find that increasing political control can increase welfare even if politicians are worse than bureaucrats. More generally, my findings suggest that traditional civil service rules emphasizing reduced control and improved bureaucratic selection may be a useful substitute for, but not a good complement to well-functioning democratic elections.

In this model, tenure makes both bad and good bureaucrats less likely to implement good policies. The latter happens because a bad policy reveals to voters that the incumbent politician is bad, and a tenured bureaucrat can thus get the politician replaced while keeping his job. In the short run, any welfare gains from bureaucrats' tenure can only come from improving the performance of politicians. Alternatively, tenure can raise welfare when the long-run gains from an improved bureaucracy offset the short run welfare losses from worse bureaucratic performance. My results provide a rationale for putting top-level bureaucratic

positions that offer more possibilities for strategic behavior outside the scope of civil service protections, as is done in many civil service systems. The results also suggest that pairing tenure with provisions to support whistle-blowers can be important. This may allow a bureaucrat to reveal a bad politician's type to voters without implementing bad policies.

2 Related literature

Most of the existing literature directly addressing theoretical considerations related to civil service reform is informal (see Pfiffner and Brook (2000) for an overview).[7] In particular, I know of no formal analysis of the welfare effects of civil service rules. Indirectly, the most relevant literature is that on bureaucracies, which remains small compared to the body of work on other political actors. Much of this literature has dealt with the question of delegation: whether policy makers are / should be elected or appointed. Recent work in economics includes Maskin and Tirole (2004), Alesina and Tabellini (2007), Coate and Knight (2011), and Vlaicu and Whalley (2011). These studies deal with the normative question of whether a decision maker should be elected (a politician), or appointed (a bureaucrat or a judge). Like them, my focus is normative, but I take it as given that the policy-making process involves *both* elected and non-elected decision makers. One question I study is how regulating the *interaction* between these two types of decision makers affects voters' ability to hold politicians accountable. While the existing literature seems most relevant in the case of high-level decision makers (e.g., whether the head of a federal agency or a city should be elected or appointed), I focus on the relationship between a politician and lower level bureaucrats who are typically the subject of civil service regulations.

In political science, studies on delegation usually take a positive (as opposed to normative) approach and ask about the conditions under which a politician will *choose* to delegate some

[7] A handful of empirical studies exist on civil service systems in specific settings, including municipal reforms in the Progressive era (Rauch, 1995), merit selection of US judges (Hanssen, 2004), the tenure system of English judges (Blanes i Vidal and Leaver, 2011), and merit systems in US states (Folke et al., 2011, Ujhelyi, 2014).

of his authority to another, possibly non-elected, decision maker (e.g., Horn, 1995, Epstein and O'Halloran, 1999, Gailmard and Patty, 2007, 2013, Fox and Jordan, 2011). Applied to civil service rules, this literature suggests interesting reasons why a politician might want to introduce laws that grant bureaucrats substantial discretion.[8] At the same time, while most politicians have the option to delegate specific tasks to subordinates, few have the ability to put in place or dismantle a comprehensive civil service system. Thus, models where delegation is one politician's choice have limited applicability to the problem of designing optimal civil service rules. By contrast, I model these rules as institutional *constraints* on politicians, and ask what type of constraints a *social planner* would like to introduce.[9]

A second strand of the literature on bureaucracies, including Besley and McLaren (1993) and Prendergast (2007), has studied the selection of bureaucrats with the right preferences. These models do not have elected politicians, but instead focus on the relationship between bureaucrats and their clients. In particular, Prendergast (2007) shows that in some cases it is beneficial to have a bureaucrat who has different preferences from that of his clients. A necessary (but, interestingly, not sufficient) condition for this is that clients' preferences be the opposite of society's. By explicitly modeling the electoral process, my paper offers a complementary perspective. Here, it may in fact be beneficial to have bureaucrats whose preferences are misaligned with society's, because this may improve the ability of elections to discipline or screen politicians.

Since civil service rules are the alternative to a patronage system, this paper also relates naturally to studies of political patronage (see Ujhelyi and Calvo (2013) and the references therein). While civil service reform is often advocated by simply referring to the disad-

[8] For example, Gailmard and Patty (2007, 2013) present a model in which a politician delegates authority in order to give bureaucrats an incentive to invest in expertise. By contrast, in Fox and Jordan (2011) a bad politician delegates in order to shift the blame for bad policies onto the bureaucrat, and avoid being punished by voters. Johnson and Libecap (1994) discuss US civil service in the federal government as being motivated by politicians' increasing transaction costs from patronage.

[9] That most politicians view civil service rules as constraints is supported by extensive descriptive evidence (e.g., Tolchin and Tolchin, 1971), by empirical evidence showing that these rules limit politicians' ability to distribute patronage (Folke et al., 2011, Ujhelyi, 2014), and by the fact that once introduced, they are difficult to reverse and tend to change infrequently (Ting et al., 2013, Ujhelyi, 2014).

vantages of patronage, this paper may contribute to a more balanced evaluation of these alternatives.

Finally, this paper belongs more broadly to the political agency literature concerned with the ability of elections to resolve informational problems in politics.[10] There has been growing interest in understanding whether this role of elections could be affected by institutional features such as term limits (Besley and Case, 1995, Smart and Sturm, 2013), separation of powers (Persson et al., 1997), or fiscal restraints (Besley and Smart, 2007). The present paper shows how civil service rules interact with the disciplining or screening of politicians in the electoral process.

3 The benchmark model

In this section, I set up the benchmark model, describe the equilibrium, and analyze the effect of civil service reforms that change politicians' control or improve the selection of bureaucrats. All proofs for this section are in the Appendix.

3.1 Setup

There are two periods, with an election held between the two. In both periods, an incumbent politician chooses a policy $E \in \{0, 1\}$. The policy is implemented by a bureaucrat who has discretion in shaping the implementation process. The policy actually implemented may therefore be different from the one chosen by the politician: let $e \in \{0, 1\}$ denote the implemented policy (throughout, I use lower case variables to distinguish bureaucrats from politicians). If $e = E$, the bureaucrat complies with the policy chosen by the politician. Here, "policies" are construed broadly and can include formal directives as well as informal requests. For example, a politician may specify the criteria for delivering low-income subsidies, and a social worker may decide whether or not to follow these criteria in distributing

[10] Barro (1973) and Ferejohn (1986) are the classic references on the role of elections in disciplining politicians, while Rogoff (1990) is the seminal study on revealing hidden information.

checks. Or a politician may ask a bureaucrat to favor a particular contractor in a procurement tender, and the bureaucrat may favor that contractor or not. Lipsky (1980) and Wilson (1989) discuss a long list of examples to show that most bureaucrats have a large degree of discretion in implementing policies.

Whether policy 0 or 1 is more desirable to voters depends on the state of the world $S \in \{0, 1\}$. Both states have equal probability and are realized independently in each period. Voters derive utility from the implemented policy according to the function

$$U(e, S) = \begin{cases} \Delta & if \quad e = S \\ 0 & if \quad e = 1 - S \end{cases}, \tag{1}$$

where $\Delta > 0$, and I will therefore refer to policies equal to S as "good" policies, while policies equal to $1 - S$ are "bad". All players discount period-2 payoffs by a factor β.

The politician can be of two types, Good or Bad. Good politicians derive the same payoff from implemented policies as the voters do: $V^{GP}(e, S) \equiv U(e, S)$. Bad politicians prefer bad policies, perhaps because they are supported by some special interest who does not share the preferences of voters. Specifically, a bad politician's payoff from the policy implemented by the bureaucrat is

$$V^{BP}(e, S) = \begin{cases} 0 & if \quad e = S \\ R & if \quad e = 1 - S \end{cases},$$

where R, the bad politician's rent from the implementation of his favorite policy, is drawn from a distribution on $[0, \infty)$ with cdf $G(.)$ and mean $\bar{R}$. Politicians may also derive a payoff from the act of choosing a policy (or, equivalently, may dislike it when a bureaucrat does not comply with their choice). I capture this by letting politicians' payoff be $V(E, e, S) = V(e, S)$ if $e = E$ but $V(E, e, S) = \mu V(e, S)$ if $e \neq E$, where $\mu \in (0, 1)$ is a constant. Lower values of μ imply a larger disutility from noncompliance by the bureaucrat.[11] Politicians also receive

[11] That the politician has some cost from a noncompliant bureaucrat (captured by μ) seems intuitive but is not crucial. The main role of this assumption is to break ties in situations where, during the game, a politician is indifferent between two policies (see the discussion of equilibrium below). One could also set

a fixed benefit V_0 from holding office, and the probability that a politician is good is Π.

Bureaucrats' objectives may differ from politicians'. The literature has modeled this by assuming either that bureaucrats have their own preferences regarding policies (e.g., Prendergast, 2007), or that bureaucrats have career concerns in the sense that they care about society's perception of their abilities (Alesina and Tabellini, 2007). Here, I follow the first route, which yields a consistent model of politicians and bureaucrats: both can be good or bad. In Section 5.3, I show how the results below can be generalized in a version of the model with career concerns.

Like the politician, the bureaucrat can also be good or bad and his type is private information. Good bureaucrats have the same utility function (1) as voters, while bad bureaucrats' preferences are given by

$$v(e,S) = \begin{cases} 0 & if \quad e = S \\ r & if \quad e = 1 - S \end{cases}.$$

Thus, bad bureaucrats want the opposite of what voters want, receiving a rent r if a bad policy is implemented. For simplicity, I assume that r is fixed exogenously.[12] Just as for politicians, bad bureaucrats' payoff could represent their personal preference or the influence of some interest group. It could also represent incompetence, if for example the bad policy is always easier to implement than the good one. I assume that bad bureaucrats are not "very bad" in the sense that their rent from a bad policy does not exceed good bureaucrats' payoff Δ from a good policy: $r < \Delta$. I discuss relaxing this assumption in Section 5.2.

A bureaucrat who does not comply with the politician's policy choice may be punished: choosing a policy $e \neq E$ has a cost h, such as a reduction in pay. In the benchmark model, the parameter h will provide a tractable way to capture the politician's degree of control

$\mu = 1$ and assume that politicians break ties based on $V(e,S)$. This would change Lemma 1 below without affecting any of the subsequent results.

[12] One could allow r to be a random variable without changing the analysis of the benchmark model. Results that depend on the magnitude of r relative to other parameters would then hold with some probability.

over bureaucrats.[13] The probability of a good bureaucrat is π, and I start by assuming that the bureaucrat's type is realized independently in each period. This may capture a situation where the specific bureaucrat charged with policy implementation is drawn randomly from the bureaucracy, so that the politician only interacts with any one bureaucrat over a short horizon. I relax this assumption and consider forward-looking bureaucrats in Section 4.[14]

The timing is as follows. At the start of period 1, the politician and the bureaucrat learn their type and the state S_1. A bad politician also learns the rent R_1. The politician chooses a policy E_1 for the first period. The bureaucrat implements a policy e_1. The implemented policy is observed publicly, and first-period payoffs are realized. Voters decide whether or not to reelect the politician. If they do not reelect, a new politician is chosen randomly. At the start of period 2, the state S_2, the rent R_2 and the bureaucrat's type are realized. The politician in office chooses a policy E_2, the bureaucrat implements a policy e_2, payoffs are realized and the game ends.[15]

The assumption that voters only see the policy as implemented by the bureaucrat, but not the politician's choice, captures the idea that most people's direct experience with government is through the bureaucracy. For example, "[f]or many people, their only concrete experience with the national government is their contact with an administrative agency like the Social Security Administration, the Immigration and Naturalization Service, or the Internal Revenue Service." (Lewis, 2003, p1.) Even if voters know that politicians passed a new tax law or reformed healthcare, they are unlikely to know what exactly these policies entail until they see them implemented by bureaucrats. Accordingly, in many cases, voters can only form beliefs about the quality of politicians' choices based on the quality of the policies

[13] The value of h can be thought of as the upper limit on the punishment available to the politician. To maximize the likelihood of compliance, the politician will always commit to a punishment equal to h.

[14] One could also extend the model to assume that good (bad) politicians are more (less) likely to have good bureaucrats. For example, replace π with $\kappa\pi$, $\kappa \in (0,1)$ for bad politicians. Then the analysis below is valid as long as κ is sufficiently large.

[15] In this model, the bureaucrat's role is simply to implement the policy chosen by the politician. He has no superior ability or information compared to the politician - his purpose is purely logistical (for example, it would be too costly if the politician used his time and other resources to implement the policy himself). Allowing for superior bureaucratic expertise would raise issues of strategic communication, and is a potentially interesting extension.

implemented by the bureaucrats. I consider the implications of relaxing this assumption in Section 5.1.

3.2 Equilibrium

The solution concept is Perfect Bayesian Equilibrium. Since there are no strategic considerations in period 2, the equilibrium is fully characterized by period-1 strategies. It consists of policy choices for each type of politician, policies implemented by each type of bureaucrat (conditional on the politician's choice), voter beliefs about the politician's type, and reelection decisions by voters given the observed policy. In equilibrium, strategies are best responses to each-other given voters' beliefs, and these beliefs are formed rationally given the strategies.

Given our assumptions on the bureaucrat's payoffs, a good (bad) bureaucrat always complies with good (bad) policies chosen by the politician. In addition, each type complies with policies he doesn't like when the punishment is sufficiently large. Thus, if a politician chooses policy E in state S, the probability that the policy will be implemented if it is good is

$$\Pr(e = E|S, E = S) = \pi + (1 - \pi)I_{r<h} \equiv \phi^G \tag{2}$$

while the probability that it will be implemented if it is bad is

$$\Pr(e = E|S, E = 1 - S) = \pi I_{\Delta<h} + 1 - \pi \equiv \phi^B, \tag{3}$$

where I is an indicator equal to 1 if the condition in its subscript is true and 0 otherwise. These expressions give the probability of compliance with good or bad policies, respectively.

The following Proposition describes the equilibrium that I will focus on in the rest of the analysis. In the Online Appendix, I show that other equilibria either generate the same outcomes of interest, or they are not robust to a slight perturbation similar to Maskin and Tirole (2004).

Proposition 1 *The following is part of an equilibrium. In period 1, good politicians choose good policies, and bad politicians choose good policies if*

$$R_1 < \beta(\phi^B \bar{R} + V_0)\frac{\phi^B + \phi^G - 1}{\phi^B + \mu(\phi^G - 1)}. \tag{4}$$

Voters reelect the politician if and only if the policy implemented by the bureaucrat is good. In period 2, politicians always choose their preferred policy.

In Proposition 1, rational voters reelect a politician when they see that the policy implemented by the bureaucrat is good. When (4) holds, a bad politician "exercises discipline": he chooses a good policy in order to get reelected. In equilibrium, this happens with probability $\lambda = G(\beta(\phi^B \bar{R} + V_0)\frac{\phi^B+\phi^G-1}{\phi^B+\mu(\phi^G-1)})$. Discipline is more likely if the expected period-2 rent ($\bar{R}$) or the value of holding office (V_0) is large, if the politician is more patient (larger β), or if the rent from getting a bad policy implemented when a good policy was chosen is larger (larger μ). Most importantly, discipline is increasing in ϕ^G and ϕ^B:

Lemma 1 *Increased compliance with good or bad policies makes the politician more likely to exercise discipline.*

Lemma 1 together with Lemma 2 below are the keys to understanding the effects of civil service reform in the benchmark model. That compliance with a good policy makes this policy more attractive to the politician is natural since noncompliance is costly. But why does compliance with a *bad* policy improve discipline? This is because if reelected, a bad politician will choose such a policy in period 2 with probability one. If bureaucrats are more willing to comply with a bad policy tomorrow, this increases a bad politician's incentive to get reelected by choosing a good policy today. This suggests that in some cases there will be a trade-off between improving bureaucrats' and politicians' performance. Making bureaucrats less compliant with bad policies can reduce the effectiveness of elections in disciplining politicians.[16]

[16] This insight does not depend on there being a last period, as I show in Section 5.4 where I consider an

While the period-1 policy choices reflect discipline (or lack thereof), the period-2 policy choice shows the quality of politicians emerging from the electoral process. Our second key lemma states that more compliant bureaucrats lead to the election of better politicians.

Lemma 2 *Holding discipline (λ) constant, increased compliance with good or bad policies improves the quality of politicians.*[17]

This Lemma is the key to understanding how civil service reform interacts with the screening role of elections. Increased compliance means that the policy implemented by the bureaucrat is more informative regarding the policy chosen by the politician, and hence his type. Increased compliance with a good policy helps voters reelect good politicians, while increased compliance with a bad policy helps throw bad politicians out of office. This suggests that in some cases there will be a trade-off between improving bureaucrats' performance and politicians' *quality*. Making bureaucrats less compliant with bad policies can reduce the effectiveness of elections in screening politicians.[18]

I now use these results to study how civil service reform affects policy choices and voter welfare. As Lemmas 1 and 2 suggest, any direct effects have to be weighed against the impact on policy making through bureaucrats' compliance.

3.3 The welfare effects of bureaucrats' selection and control

Civil service reform often aims to improve bureaucrats' quality through entrance examinations and other qualification requirements. In the US, merit-based recruitment was introduced into the federal bureaucracy by the Pendleton Act of 1883, and lower-level governments gradually followed. In the model, the quality of the bureaucracy is captured by the

extension to an infinite horizon. What it depends on is the existence of future rents that can be obtained if the politician is reelected.

[17] As is common in political agency models, better discipline mechanically leads to less screening, as it implies that bad politicians are less likely to be revealed. By holding λ constant, Lemma 2 focuses on the effects that do not follow mechanically from Lemma 1.

[18] Note that Lemmas 1 and 2 do not rely on a specific model of bureaucrat behavior. These results hold as long as bureaucrats can have some discretion, so that ϕ^G and ϕ^B are not always 1, regardless of where ϕ^G and ϕ^B come from. For example, this will also be true if bureaucrats have career concerns. I explore this extension in more detail in Section 5.3.

probability π that a bureaucrat's preferences are aligned with voters'. For example, civil service exams might be designed to select bureaucrats who are more likely to share society's preferences. Another important component of civil service laws is the degree of control they give politicians over bureaucrats, or the degree to which bureaucrats are "insulated" from politics. Control can be limited by fixed pay-scales and seniority-based promotions, tenure, and a prohibition on bureaucrats' performing political services. While the Pendleton Act reduced control, recent reforms starting with the 1978 Civil Service Reform Act sought to make bureaucrats more responsive by increasing control. In this benchmark model, the degree of control is captured by the size of the punishment h that the bureaucrat faces for not complying with the policy chosen by the politician. We can distinguish three regimes: *full control* over both good and bad bureaucrats ($\Delta < h$), *selective control* over bad but not over good bureaucrats ($r < h < \Delta$), and *no control* over either type of bureaucrat ($h < r$).

The question I ask here is: if society decides to engage in civil service reform that changes h or π, how will this affect the quality of politicians in office, the policies they choose, and voter welfare?

Not surprisingly, the first best can be achieved by a civil service reform that eliminates full control and simultaneously ensures that only good bureaucrats are hired. This follows immediately from (2) and (3): $h < \Delta$ and $\pi = 1$ yield $\phi^B = 0$ and $\phi^G = 1$, so that bureaucrats always implement good policies and the incumbent politician's type becomes irrelevant. Of course, such perfect reform is seldom feasible, just like it is generally not possible to replace politicians with bureaucrats (at least in the contexts where the question of optimal civil service rules arises).

Propositions 2 and 3 below describe the effects of changing control and selection on politicians' choices, the quality of politicians emerging from the electoral process, and voter

welfare.[19] The Online Appendix provides numerical examples.[20]

Proposition 2 *(i) Reducing the politician's control over bureaucrats makes the politician less likely to choose a good policy in period 1.*
(ii) No control always leads to worse period-2 politicians than selective or full control. Selective control leads to worse politicians than full control iff $\xi \equiv \frac{G[\beta(\bar{R}+V_0)]-G[\beta((1-\pi)\bar{R}+V_0)]}{1-G[\beta((1-\pi)\bar{R}+V_0)]} < \pi$.
(iii) In terms of voter welfare, selective control always dominates no control. Full control dominates selective control iff $\frac{1}{1-G[\beta((1-\pi)\bar{R}+V_0)])}\beta < \beta\Pi(2-\pi-\frac{\xi}{\pi}) - 1 + \frac{\xi}{\pi}$ *and it dominates no control iff* $(1-\Pi)(\Pi\beta + (1-\beta\Pi)G[\beta(\bar{R}+V_0)]) > (\pi-\Pi)(1+\beta)$.

Part (iii) of the proposition shows that removing the politician's control over bureaucrats can reduce welfare even if it is done selectively (so that the politician retains control over bad bureaucrats). Parts (i) and (ii) describe the mechanism behind this finding. Of course *conditional* on the policy chosen by the politician less control over good bureaucrats improves welfare. However, changing control will also affect politicians' choices

Part (i) of the Proposition shows that giving politicians less control always results in worse policy choices in period 1. This is a direct consequence of Lemma 1: less control means that the bureaucrat will be less likely to comply with the politician's choice and this lowers the politician's incentive to get reelected by choosing a good policy. Thus, we have a trade-off between bureaucrats' and politicians' performance. This can offset the direct benefit of reduced control and lead to lower welfare. To see how the parameters of the model affect this tradeoff, set voter's discount factor to 0, so that only period-1 welfare matters. Part (iii) then implies that giving the politician more control is desirable when the quality of the bureaucracy (π) is low or the quality of politicians (Π) is high.[21] However, more

[19] Although in this model politicians' choices have no social value of their own, in reality they may have long-term consequences beyond their effect on the current policies that bureaucrats implement. For example, they may affect voters' payoffs far in the future, or they may create constraints for future policy-making. Similarly, having higher quality politicians in office might have other benefits than the ones modeled here.

[20] As the proofs make clear, statements like "increase" should be read as "increase or stay constant" (i.e., weakly increase). I chose to drop the qualifier in the interest of readability.

[21] In this case, in part (iii), full control dominates selective control iff $\xi > \pi$ and it dominates no control iff $\Pi + (1-\Pi)G[\beta(\bar{R}+V_0)] > \pi$.

control can be desirable even if politicians are worse than bureaucrats ($\Pi << \pi$) because the politicians' incentive can compensate for their lower quality. Giving a low-Π politician some control is desirable if the politician is patient (high β), or if the value of holding office (V_0) or the expected rent ($\bar{R}$) is large. The worse the politician is on average (the larger average rent he gets from a bad policy), the more he needs incentives to act in voters' interest, therefore the more likely it is that giving him control will raise period-1 welfare.

Changes in the politician's period-1 choice naturally affect the quality of the politician emerging from the electoral process in period 2. For example, if bad politicians always exercise discipline, they will be reelected, and the screening role of elections disappears. However, civil service reform also affects *directly* voters' ability to screen politicians. This is because bureaucrats affect the amount of information that voters gain about the incumbent politician (Lemma 2). Even if bad politicians do not exercise discipline, they will be reelected if good bureaucrats do not comply with their bad policy choices. Part (ii) of the proposition describes the impact of changing control on the screening of politicians. No control results in the worst expected quality of period-2 politicians. In this case, the period-1 policy implemented is determined entirely by the bureaucrat's type and therefore conveys no information regarding the politician. As control is increased, the implemented policy becomes more informative regarding the politician's choice, allowing more screening. However, the effect on the politician's expected quality need not be monotonic. Full control can yield worse politicians than selective control because the bad politician is more likely to choose a good policy (part (i)), and hence less likely to be revealed. This can offset the increased flow of information resulting from more control.[22]

The welfare calculation of changing control needs to balance these indirect effects on voters' ability to incentivize and screen politicians with the direct effect on bureaucrats' performance. Compared to no control, selective control represents an improvement in all dimensions (bureaucratic performance, discipline, politicians' quality) and therefore yields

[22] When there is no discipline (e.g., because the politician's discount factor is 0), this offsetting effect is not present, and more control always increases the expected quality of politicians.

higher welfare. Full control, however, can have positive as well as negative welfare effects. It lowers bureaucratic performance by forcing good bureaucrats to comply with bad policies, but it improves politicians' discipline, and also has the potential to improve electoral screening. Full control tends to be more desirable than no control when π is low, Π is large, or when the discipline $G[\beta(\bar{R}+V_0)]$ it creates is large.

Like changing control, changing the selection of bureaucrats (π), also affects the interaction of voters and politicians. The welfare effects of improved bureaucrat quality are thus determined by these indirect effects together with the direct effects on bureaucratic performance. As the following proposition shows, better bureaucrats can lead to worse politicians and worse policies.

Proposition 3 *Improving the quality of bureaucrats (π):*
(i) makes the politician less likely to choose a good policy in period 1;
(ii) lowers the quality of the period-2 politician when $h \in (r, \Delta)$ and $\psi \equiv \frac{1-G[\beta(\bar{R}(1-\pi)+V_0)]}{G'[\beta(\bar{R}(1-\pi)+V_0)]} > \beta\bar{R}(1-\pi)$, and increases it otherwise;
(iii) lowers voter welfare when $h \in (r, \Delta)$ and $\beta\bar{R}(1-\pi) - \psi > \frac{\beta}{1-\beta\Pi(1-\pi)}(\frac{1}{G'[\beta((1-\pi)\bar{R}+V_0)]} - \psi\Pi(1-\pi))$, and increases it otherwise;

Part (i) of the Proposition shows that improving the quality π of bureaucrats always leads to worse period-1 behavior by the politician. This is because better bureaucrats have lower compliance with bad policies and this reduces politicians' incentives for reelection (Lemma 1). Thus, we have a trade-off between bureaucrats' quality and politicians' performance. This can result in an improved bureaucracy implementing worse policies, and hence a reduction in welfare. A better bureaucracy leading to lower welfare tends to be more likely if the initial quality of bureaucrats (π) is low, or if the politician's discount factor (β), value of holding office (V_0), or expected rent ($\bar{R}$) is large.[23] This suggests, for example, that a reform that improves bureaucrat selection may have to raise π substantially in order to be beneficial.

[23] When voters' discount factor is 0, the condition in part (iii) becomes $\beta\bar{R}(1-\pi) > \psi$. Note that ψ is the Mills ratio of the distribution G, which for common distributions (including normal, uniform, or exponential) is nonincreasing. In these cases, the two sides of the inequality move in opposite directions.

Part (ii) of the proposition highlights the possibility of a trade-off between the quality of bureaucrats and the quality of politicians emerging from the electoral process. When $h \in (r, \Delta)$, improving the quality of bureaucrats (π) means that bad policies are less likely to be complied with, and voters are therefore more likely to reelect a bad politician. When there is no discipline ($G \equiv 0$), this trade-off always results in worse quality politicians. In other cases, increasing π also lowers discipline (part (i)), which tends to improve screening. The condition in the proposition determines when the total effect on screening is negative. Overall, the welfare effects of improved bureaucrat quality are determined by the direct effect of π on the policy implemented as well as its effects on politicians' behavior and their screening in the electoral process. Improving the bureaucracy tends to be more desirable when bureaucrats' quality is already high, politicians' discipline G is low, or when voters are more patient.

3.4 Discussion

Propositions 2 and 3 may help rationalize certain aspects of real-world civil service reforms. Recent US reforms aimed at increasing political control over bureaucrats by weakening or removing civil service protections may be optimal if society believes that the majority of incumbent bureaucrats are bad (π is low). Indeed, this is one reading of common complaints regarding inefficient bureaucracies and red tape.[24] In this case, Proposition 2(i) implies that increasing control will raise welfare by giving politicians an incentive to choose better policies. Since removing control is more desirable when π is large, this rationalizes why early civil service reforms, which aimed at lowering politicians' control over bureaucrats, put great emphasis on simultaneously improving bureaucratic selection. Interestingly, the model predicts that reforms that improve the quality of bureaucrats will typically be accompanied

[24] Characteristics that "many Americans associate with the word *bureaucracy*: flabby, overpaid, and lazy; unimaginative; a demanding leviathan; slow to abandon unsuccessful policies and accept new ideas; arrogant, smug, and condescending; impersonal; red-tape artists..." (Ingraham, 1995, ix). Note that unresponsive bureaucracies alone cannot provide a full explanation for these reforms, since unresponsiveness is socially optimal if politicians have a high probability of choosing bad policies.

by politicians' choices becoming worse (Proposition 3(i)).

More generally, the above results show that civil service reform affects the ability of elections to discipline and screen politicians. Reforms that insulate the bureaucracy from politicians may also insulate politicians from voters. One implication is that the case for civil service reform is much more clear-cut when the electoral system is ineffective at serving these disciplining and screening functions to begin with. If politicians always choose their preferred policies and good or bad politicians are equally likely to be reelected, then improving bureaucratic selection and lowering control over good bureaucrats is always desirable. In this case, the trade-offs with politicians' behavior or quality are avoided. To the extent that democratic elections today are more effective than 100 years ago, these observations can shed light on the different focus of early and later civil service reforms. Indeed, Progressive era reformers emphasized the improved selection of bureaucrats and reduced control in a period when "Civil service systems, or merit systems, were equated with "good" government. They represented fair and equitable examinations, qualified public servants, and a commitment to the higher ideals of the state. Politics, on the other hand, had come to represent what was wrong with government." (Ingraham, 1995, 25). In this sense, a bureaucracy with strong civil service protections may have served as a substitute to effective democratic elections. However, it may not be a good *complement* to such elections, as the more recent reforms suggest.

4 Strategic bureaucrats and tenure

Above, I have assumed that in every period a new bureaucrat is chosen and asked to implement the policy. In reality, bureaucrats may interact with the politician over multiple periods, and in fact an important consideration of civil service systems is whether they can be fired. A longer time horizon implies that bureaucrats' actions may be affected by a desire to keep their job. Furthermore, bureaucrats may strategically influence the reelection

chances of the incumbent politician through the policies they implement.

In this section I extend the model to take these considerations into account. I use the model to study the effect of limiting politicians' control through bureaucratic tenure. Specifically, I compare a situation where the bureaucrat can lose his job after period 1 if he gets fired by the politician or if the politician is not reelected (untenured case), to one where he always keeps his job in both periods (tenured case).[25] The details of the analysis are in the Online Appendix.

4.1 Setup and equilibrium

The sequence of events is now as follows. At the start of period 1, the politician and the bureaucrat learn their type and the state S_1. A bad politician learns the rent R_1, and the politician chooses a policy E_1 for the first period. The bureaucrat sees E_1, forms a belief about the politician's type, and implements a policy e_1. The politician sees e_1, forms a belief about the bureaucrat's type, and, in the nontenured system, decides whether to fire the bureaucrat.[26] The implemented policy is observed publicly, and first-period payoffs are realized. Voters form a belief about the politician's type and the bureaucrat's type based on e_1 (they do not observe whether the bureaucrat was fired), and decide whether or not to reelect the politician. If they do not reelect, a new politician and, if the first bureaucrat was fired, a new bureaucrat are chosen randomly at the start of period 2. The state S_2 and the rent R_2 are realized, policies E_2 and e_2 are chosen and the game ends.

Solving these models (the tenured and the untenured version) requires keeping track of all players' beliefs regarding both politicians and bureaucrats. Strategic bureaucrats may now have different propensity to comply with specific policies in periods 1 and 2. This is because the bureaucrat's decision can have implications for whether or not he keeps his job in period 2, and because the politician's choice may reveal his type to the bureaucrat, who

[25] Other means of control, such as a reduction in pay, are still captured by the parameter h.

[26] I assume that a politician who is indifferent between firing or retaining the bureaucrat retains him. I also assume that in the non-tenured system, once a bureaucrat is fired he receives a payoff of 0 in future periods.

can decide whether to facilitate the politician's reelection. Voters decide whether or not to reelect the incumbent politician based on the probability of obtaining a good policy in period 2, which can now depend on updated beliefs regarding both the incumbent politician and the incumbent bureaucrat. As in the benchmark case, good politicians choose good policies, and bad politicians choose bad policies if the rent is large enough, although the cutoff can differ from the benchmark case. Good (bad) bureaucrats always comply with good (bad) policies, and they comply with the other policy if the punishment is large enough. Voters reelect after a good implemented policy and do not reelect after a bad one.

4.2 The effect of tenure

To simplify the notation, let $q[x] \equiv 1 + \Pi\beta(\frac{1}{\Pi+(1-\Pi)G(x)} - 1)$, where $q > 1$ and $q' < 0$ for $x \in [0, \infty)$. We then have the following result:

Proposition 4 *(i) When introducing tenure affects the period-1 behavior of bureaucrats, it causes bad bureaucrats to stop complying with good policies and / or good bureaucrats to start complying with bad ones.*
(ii) Tenure can only raise period-1 welfare when it improves the politician's choice and has no effect on bureaucrats. Specifically, when $rq[\beta(\bar{R} + V_0)] < h < \frac{\Delta}{1+\beta\Pi}$, *introducing tenure can make politicians more likely to choose a good policy and can raise welfare. In all other cases, tenure can only lead to lower welfare.*
(iii) Tenure raises the present value of voter welfare when period-1 welfare increases, and when $r < h < \min(\frac{\Delta}{1+\beta\Pi}, rq[\beta(R + V_0)]$ *and* $\frac{\pi}{\Pi} > \frac{q[\beta((1-\pi)\bar{R}+V_0)]}{q[\beta((1-\pi)\bar{R}+V_0)]-1}$. *In all other cases, tenure can only lead to lower welfare.*

Part (i) of the proposition describes the effect of tenure on bureaucrats' behavior. Good bureaucrats become more willing to comply with bad policies because this can lead to the replacement of a politician who has revealed himself to be bad without jeopardizing the

bureaucrat's job.[27] At the same time, bad bureaucrats become less likely to comply with good policies. This is both because a bad policy no longer gets the bureaucrat replaced, and because a good policy choice is more likely to come from a good incumbent, and therefore the bureaucrat gains by having him replaced by a random politician in period 2. Thus, compared to untenured bureaucrats, tenured bureaucrats are more likely to comply with bad policies and less likely to comply with good ones. In this sense, we should expect bureaucracies with tenure to perform worse than those without tenure, holding the politician's choice constant.

The politician's response to the bureaucrats' increased willingness to comply with bad policies is typically a higher likelihood of choosing a bad policy. This leads to worse policies being implemented and lower welfare in period 1 (Proposition 4 (ii)). It is only when tenure improves the politician's behavior and has no impact on bureaucrats that tenure can raise welfare. When the condition in part (ii) holds, bad bureaucrats comply with any policy while good bureaucrats always implement a good policy both with and without tenure. This means that a bad politician can learn the bureaucrat's type by choosing a bad policy, allowing him to fire a good bureaucrat in the untenured case. Tenure takes away this possibility and thus makes the bad policy less attractive. The politician becomes more likely to choose a good policy and welfare increases.

The effect of tenure on the present value of voter welfare is given in part (iii) of Proposition 4. Since tenure cannot improve the period 1 behavior of bureaucrats, its value can only come from either the improved performance of politicians raising period 1 welfare, or from improved policies in period 2. The present value of voter welfare increases when first-period welfare increases. In addition, the present value of welfare can increase also if $r < h < \min(\frac{\Delta}{1+\beta\Pi}, rq[\beta(R+V_0)]$, provided that the fraction of good bureaucrats π is sufficiently

[27] This effect runs counter to the common notion that tenure is valuable because it allows good bureaucrats to work undisturbed by (bad) politicians. Although good bureaucrats' payoff from a good policy does rise, because they no longer get fired for it, their payoff from a bad policy increases as well. This highlights some of the nuances of civil service reform in a democracy: if voters judge politicians based on the policies implemented by bureaucrats, good bureaucrats with tenure benefit from complying with policies that may get a bad politician thrown out of office.

large.[28] In this case bad politicians' discipline becomes 0 leading to lower welfare in period 1, but good bureaucrats are no longer fired, and when π is large, the resulting gain in period 2 can offset the loss of utility in period 1. In all other cases, introducing tenure can only lower the present value of welfare.

4.3 Discussion

One implication of the above results is that a tenure system for bureaucrats can have undesirable consequences when bureaucrats act strategically and understand that their actions can affect a politician's reelection. As we saw, tenure can only make the performance of such bureaucrats worse. Since in practice strategic behavior is more likely to be relevant for high-level bureaucrats, this supports putting these positions outside of the tenure system. Indeed, most real-world systems designate several top-level positions as being "political", i.e., appointed by whoever is in power without the constraints imposed by civil service regulations. The common view is that this ensures that politicians can choose top bureaucrats who share their preferences, but Wilson (1989, p198) points out that in practice the appointing politician (e.g., the president appointing an agency head) has very little idea of the preferences of his appointee on specific policy questions (some of which may only arise in the future). This model suggests an alternative explanation: the lack of tenure in these positions ensures that top bureaucrats are disciplined by the same electoral incentives as their appointers. This raises welfare by lowering their incentive to implement bad policies in order to undermine the politician.[29]

Alternatively, the negative implications of tenure can be mitigated if bureaucrats have other means of communicating with voters besides the policies they implement. Whistleblower rules that encourage public employees to reveal information about the policy-making

[28] In the second condition in Part (iii) of Proposition 4, $\frac{q}{q-1}$ is decreasing in π.

[29] Concern over such "sabotage" by tenured bureaucrats led one Reagan administration official to recommend that career bureaucrats be kept in the dark regarding the objectives of specific policies and how the pieces of the policy puzzle fit together. This "jigsaw puzzle management" was thought to minimize bureaucrats' incentive to distort policy implementation (Ingraham, 1995, pp100-101).

process might serve this purpose. For example, the Civil Service Reform Act created the Office of Special Counsel specifically to protect whistle-blowers (Ingraham, 1995). In the model, this could allow a good bureaucrat to reveal a bad politician's type without having to implement a bad policy. The above results suggest that pairing bureaucratic tenure with whistle-blower rules may be particularly useful.[30]

Finally, the above results also have implications for understanding the workings of a system of political patronage. Two features commonly associated with patronage are that it represents some form of vote buying (employment in exchange for political support), and that employees can be fired at any time.[31] In the above model, the ability to fire bureaucrats does indeed give incumbents an electoral advantage. An immediate consequence of Proposition 4(i) is that when bureaucrats do not have tenure, politicians are more likely to be reelected. However, this result does not rely on any direct vote buying by politicians. Instead, the absence of tenure automatically aligns bureaucrats and politicians' incentives. Bureaucrats without job security will be more likely to implement policies that get a politician reelected. In this sense, explicit vote buying may not be a crucial feature of the patronage relationship.

5 Other extensions

This section discusses various other extensions to the benchmark model. For each of these the Online Appendix contains further details.

5.1 Politician's choice can be observed

Suppose that, after the politician chooses E, the voter observes this with some probability p. This does not affect bureaucrats' behavior in the benchmark model. The politician will be reelected if either the voter observes that $E = S$, or if he does not observe E but observes that $e = S$. Good politicians continue choosing good policies, while the condition given in

[30] See Ting (2008) for an analysis of whistle-blowing in a different model.

[31] Clearly, patronage systems have other relevant features which my model is not suited to study.

(4) for a bad politician to choose a good policy now becomes

$$R_1 < \beta(\phi^B \bar{R} + V_0)\frac{p + (1-p)(\phi^B + \phi^G - 1)}{p + (1-p)[\phi^B + \mu(\phi^G - 1)]}.$$

Not surprisingly, the larger the probability p that his choices will be observed, the more likely the politician is to exercise discipline.

How does $p > 0$ change the impact of civil service reform? It is easy to see that p does not affect the impact of reform in period 1 because it does not affect politicians' incentive to exercise discipline. Intuitively, these effects operate through future payoffs that are contingent on reelection. The parameter p only affects the probability of reelection, and it does not affect these payoffs. In particular, less control or better bureaucrats lead to worse period-1 behavior by the politician even if $p > 0$ (part (i) of Propositions 2 and 3).

The possibility of observing politicians' choices directly does change the bureaucrats' impact on voters' ability to screen politicians. This is natural: if $p = 1$, so that politicians' choices are always observed, the bureaucrat's policy implementation is irrelevant for voters' beliefs regarding the politician. In this case, civil service reform does not affect screening directly (only indirectly, through λ). Thus, while similar results to those in Proposition 2 and 3 parts (ii) and (iii) can be stated, the formal conditions will be different. In particular, the larger is p, the less likely that civil service reform will interfere with voters' ability to screen politicians. Hence, improved selection (higher π) or reduced control (lower h) will tend to be more desirable when voters are more likely to directly observe politicians' choices.

5.2 Perverse control

The model above assumed that $r < \Delta$: bad bureaucrats' payoff from their favorite policy is less than good bureaucrats' payoff from their favorite. The role of this assumption was to create the possibility of "selective control," where the politician has control over bad but not over good bureaucrats ($r < h < \Delta$). This is clearly a desirable regime. By contrast, if $\Delta < r$,

then selective control is replaced by "perverse control," where the politician has control over good but not over bad bureaucrats ($\Delta < h < r$). This could be a relevant possibility, e.g., in some rentier states where a bureaucrat's pecuniary benefits from choosing bad policies could be particularly large.

In the benchmark model, perverse control always yields lower welfare than no control. While no control requires a good bureaucrat for a good policy to be implemented, perverse control requires both a good bureaucrat and a good policy choice by the politician. In this case, lowering politicians' control might be particularly desirable.

When $\Delta < h < r$, improving bureaucrat selection (π) always raises welfare. The direct effect is clear: a better bureaucracy means that good politicians' choices are more likely to be complied with. Interestingly, this can be reinforced by two "multiplier" effects. First, increased compliance with good policies makes these policies more attractive to bad politicians, which improves discipline. Second, increased compliance with good policies means that good politicians are more likely to be reelected, which improves screening.

Overall, when bad bureaucrats are "very bad" ($\Delta < r$), the case for less control and improved selection is reinforced.

5.3 Career concerns

In this section I extend the benchmark model to include bureaucrats with career concerns, and describe the effects of civil service reform in this setting. The setup is the same as in the benchmark model of Section 3, but bureaucrats care about voters' perception of their type. This captures the idea that bureaucrats care about alternative job opportunities where the perceived value of their talents matter. Following Alesina and Tabellini (2007), let the bureaucrat's benefit be $m \cdot \hat{\pi}$, where $m \geq 0$ is the market value of talent, and $\hat{\pi}$ is voters' belief that the bureaucrat is good given the implemented policy.

The bureaucrats' probability of compliance ϕ^G and ϕ^B now has to be derived as part of

the equilibrium. This yields

$$(\phi^G, \phi^B) = \begin{cases} (1,1) & if \quad \Delta < h \\ (1, 1-\pi) & if \quad |r - \pi m| < h < \Delta + \pi m \\ (\pi, 1-\pi) & if \quad h < r - m \end{cases} . \tag{5}$$

Just like in the benchmark model, a sufficiently high h can guarantee compliance with any policy. However, for $h \in (\Delta, \Delta + \pi m)$, there is another equilibrium where good bureaucrats only implement good policies because the market value of their reputation is enough to compensate them for any punishment. Similarly, the value of reputation leads bad bureaucrats to comply with good policies even for $h \in (r - \pi m, r)$.

Results equivalent to Proposition 2 and 3 can now be established exactly as in Appendix A by simply replacing the three parameter ranges ($\Delta < h$, $h \in (r, \Delta)$, $h < r$) with the corresponding ranges in (5). Proposition 2 holds exactly as written, where full, selective and no control now refers to the new parameter ranges in (5). Proposition 3 holds replacing the $h \in (r, \Delta)$ condition with $h \in (|r - \pi m|, \Delta + \pi m)$. Note that while in the benchmark model changing π never had an impact on welfare for $h > \Delta$, this is no longer the case in one of the equilibria when $h \in (\Delta, \Delta + \pi m)$. In this sense, the effects described in Proposition 3 appear for a larger set of parameters when bureaucrats have career concerns.

5.4 Infinite horizon

In this section I analyze how civil service reform affects the ability of elections to discipline or screen politicians when there are many periods. I show that the trade-off between better bureaucrats and better political performance can also arise in this case. This extends the results in Proposition 3 to an infinite horizon model.

The setup is as in Section 3, but there is an election after each period and the politician stays in office for as many period as he is reelected. I first consider an equilibrium with the following (Markov) strategies. Voters reelect after each period where the incumbent chose a

good policy and do not reelect otherwise. The bad politician uses a cutoff strategy where he chooses the good policy whenever the realized rent in period t, R_t, is smaller than a cutoff value R^*, and he chooses the bad policy otherwise. In this case, the continuation value $V(R^*)$ tomorrow of a bad politician reelected today satisfies

$$V(R^*) = V^0 + \int_{R^*}^{\infty} RdG(R)\phi^B + (1-\phi^B)\beta V(R^*)(1-G(R^*)) + G(R^*)\phi^G \beta V(R^*) + (1-\phi^G)\mu \int_0^{R^*} RdG(R).$$

For $h \in (r, \Delta)$, this can be used to obtain the equilibrium cutoff

$$R^* = \beta \frac{V^0 + \int_{R^*}^{\infty} RdG(R)(1-\pi)}{1-\beta+(1-\pi)\beta(1-G(R^*))}. \tag{6}$$

One may check that the right-hand side of this expression is increasing in R^*, whereas its derivative w.r.t. π is proportional to $\beta(1-G(R^*)))V_0 - \int_{R^*}^{\infty} RdG(R)(1-\beta)$. For small enough V_0, this is negative, implying that $\frac{\partial R^*}{\partial \pi} < 0$. When the quality of bureaucrats is higher, the politician is less likely to exercise discipline, as in Proposition 3(i). Intuitively, when V_0 is low, the incentive for discipline comes from the possibility of getting a higher rent in the future if a bigger draw R_t arrives and a bad policy is implemented. However, compliance with a bad policy is less likely when π is larger, lowering the incentive for discipline.

To see the effect on screening (as in Proposition 3(ii)) consider the case of $\lambda = 0$ so that a bad politician never chooses a good policy (this is the case, e.g., when β is close to 0), and assume $h \in (r, \Delta)$. Denoting Γ_t the probability that a politician in office in period t is good, we have $\Gamma_t = \Gamma_{t-1} + (1-\Gamma_{t-1})(1-\pi)\Pi$, where the second term comes from a bad politician who is thrown out of office and replaced by a good politician. Since $\Gamma_1 = \Pi$, some algebra yields $\Gamma_t = 1 - (1-\Pi)[1-(1-\pi)\Pi]^{t-1}$, which is decreasing in π. In this case, improving the quality of bureaucrats lowers the probability of a good politician being in office in every period t. As in Proposition 3(ii), this is because a higher π makes it more likely that a bad

politician is reelected in spite of his chosen policy.[32] The Online Appendix describes some of the welfare effects of reform in this infinite horizon model.

6 Conclusion

Political patronage is widely perceived to be a socially costly system to organize a bureaucracy - indeed, it was concern about these costs that gave rise to the first wave of US civil service reforms in the Progressive era. However, very little is known about the costs and benefits of the alternative to patronage: a civil service system. This paper has presented a welfare analysis of civil service reform in a democracy. I focused on the effects of improving the quality of bureaucrats and of changing the degree of control that politicians have over them, including whether bureaucrats can be fired. In the US, these features of the civil service system have been at the center of policy debates at least since the Pendleton Act.

In thinking about optimal civil service rules, a natural starting point is that politicians should have less influence over bureaucrats when bureaucrats are likely to be good and politicians bad. However, this intuition ignores the endogeneity of politicians' quality and actions in an electoral system. In my model, more compliant bureaucrats give politicians more incentive to choose good policies and transmit more information to voters about the politicians' type. When civil service reform reduces compliance, it can interfere with the ability of elections to discipline or screen politicians.

I find that when there are few good bureaucrats, giving politicians control over them is desirable because it increases compliance and improves policy choices. This can be true even if politicians are worse than bureaucrats. By contrast, lowering political control through civil service protections will improve welfare provided that a large increase in bureaucratic quality can be realized. This highlights the importance of pairing civil service protections with improved bureaucrat selection, as in the early US reforms.

[32] Since a good politician, once elected, is never thrown out of office, $\Gamma_t \to 1$ as t grows large regardless of π or Π.

A tenure system increases bureaucrats' incentives to implement bad policies to replace a politician who does not share their preferences. Thus, tenure tends to make bureaucrats' performance worse, and this tends to lower welfare. Tenure can only be valuable when it improves the performance of the politician, or when the future gain from a higher quality bureaucracy offsets the short run welfare losses. For top-level bureaucrats prone to strategic behavior, the absence of tenure may be socially desirable to align their incentives with that of the politician. Alternatively, a tenure system paired with whistle-blower protections may be more advantageous.

The framework used here is a useful point of departure in analyzing the welfare effects of civil service rules. As shown in Section 5, several of the assumptions can be relaxed without much difficulty. One interesting extension that is beyond the scope of this paper is allowing politicians' and / or bureaucrats' quality to emerge endogenously in the model. Indeed, standard citizen-candidate approaches would suggest that politicians' quality Π would respond to how civil service rules change the payoffs accruing to different politicians in the model. Similarly, bureaucrats' quality π can be affected by their incentive to work for the government or the private sector, by politicians' incentives to hire certain types of bureaucrats, as in Ujhelyi and Calvo (2013), and by bureaucrats' incentives to acquire expertise, as in Gailmard and Patty (2007). Incorporating some of these features in the above model is an interesting avenue for future research.

While the focus of this paper has been normative, there exists empirical evidence consistent with the basic observation that civil service reform affects politicians' performance and can, under some conditions, lead to worse policies being adopted. In particular, Ujhelyi (2014) shows that the adoption of civil service protections in US state governments throughout the 20th century caused state politicians to reallocate spending towards local (unreformed) governments. Moreover, these institutional changes were accompanied by decreased spending on infrastructure and long-term capital projects.

The above results show that societies currently engaged in reforming the operation of

their bureaucracies may face trade-offs between improving the performance of bureaucrats or the performance of politicians, especially in the context of a well-functioning electoral system. Apart from their direct effect on bureaucrats, optimal reform should also consider the effect of civil service rules on both the policy-making and the electoral process.

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A Appendix

Proof of Proposition 1. Suppose that voters reelect the politician after a good policy is implemented but not after a bad one. A good politician will then choose a good policy in period 1. Given the realized rent R_1 in period 1, a bad politician's expected payoff from choosing a good policy is $\phi^G\beta(\phi^B\bar{R}+V_0)+(1-\phi^G)\mu R_1$, where the first term represents the

payoff from being reelected when the bureaucrat complies, and the second term represents the rent collected when the bureaucrat does not comply. The expected payoff from choosing a bad policy is $(1-\phi^B)\beta(\phi^B\bar{R}+V_0)+\phi^B R_1$. Comparing the two, a bad politician chooses the good policy in period 1 if and only if the realization of R_1 satisfies (4). Ex ante, a bad politician choosing a good policy has probability $\lambda = G(\beta(\phi^B\bar{R}+V_0)\frac{\phi^B+\phi^G-1}{\phi^B+\mu(\phi^G-1)})$. Thus, voters' belief that the incumbent is good conditional on a good policy being implemented is

$$\hat{\Pi}|_{e=S} = \frac{\Pi\phi^G}{\Pi\phi^G + (1-\Pi)[\lambda\phi^G + (1-\lambda)(1-\phi^B)]}, \tag{7}$$

while the probability that he is good conditional on a bad implemented policy is

$$\hat{\Pi}|_{e=1-S} = \frac{\Pi(1-\phi^G)}{\Pi(1-\phi^G) + (1-\Pi)[\lambda(1-\phi^G) + (1-\lambda)\phi^B]}. \tag{8}$$

Since $\hat{\Pi}|_{e=S} \geq \Pi \geq \hat{\Pi}|_{e=1-S}$, it is indeed in voters' best interest to reelect the politician when they learn that a good policy was implemented, and to not reelect him after a bad policy. Thus, we have an equilibrium.

Proof of Lemma 2. Imagine nature picking two politicians, one for period 1 who takes office, and one for period 2 who takes office if voters do not reelect the first one. Then $E_2 = S_2$ if both politicians are good (with probability Π^2), if the first one is good, the second one bad, but the first one is reelected (with probability $\Pi(1-\Pi)\phi^G$), or if the first one is bad, the second one good, and the first one is not reelected (with probability $\Pi(1-\Pi)[(1-\lambda)\phi^B + \lambda(1-\phi^G)]$). The probability of a good policy being chosen, i.e., a good politician being in office in period 2 is therefore

$$\Pr(E_2 = S_2) = \Pi^2 + \Pi(1-\Pi)[(\phi^G+\phi^B)(1-\lambda)+\lambda], \tag{9}$$

and $\frac{\partial \Pr(E_2=S_2)}{\partial(\phi^G+\phi^B)} \geq 0$.

Proof of Proposition 2. (i) We may use (2), (3) and (4) to obtain the probability that the politician chooses a good policy:

$$\begin{aligned} \Pr(E_1 &= S_1) = \Pi + (1-\Pi)\lambda, \\ \text{where } \lambda &= G\left[\beta((\pi I_{\Delta<h} + 1 - \pi)\bar{R} + V_0)\frac{\pi I_{\Delta<h} + (1-\pi)I_{r<h}}{1 + \pi(I_{\Delta<h} - 1) + \mu(1-\pi)(I_{r<h} - 1)}\right] \end{aligned} \quad (10)$$

We have $\lambda = G[\beta(\bar{R}+V_0)]$ when $h > \Delta$, $\lambda = G[\beta((1-\pi)\bar{R}+V_0)]$ when $h \in (r, \Delta)$, and $\lambda = 0$ when $h < r$. Using the fact that $G' > 0$ and comparing these cases yields the stated results regarding the politician's choice. (ii) Using (2), (3), and (9), the quality of the period-2 politician is given by

$$\Pr(E_2 = S_2) = \begin{cases} \Pi + \Pi(1-\Pi)(1 - G[\beta(\bar{R} + V_0)]) & if \quad \Delta < h \\ \Pi + \Pi(1-\Pi)(1-\pi)(1 - G[\beta((1-\pi)\bar{R} + V_0)]) & if \quad r < h < \Delta \\ \Pi & if \quad h < r \end{cases} \quad (11)$$

Comparing these cases as above yields the results on the politician's quality. (iii) The present value of voter welfare is given by $\Delta(\Pr(e_1 = S_1) + \beta \Pr(e_2 = S_2))$. Write $\Pr(e_1 = S_1) = \Pi\phi^G + (1-\Pi)[\phi^G\lambda + (1-\phi^B)(1-\lambda)]$. Using (2), (3) and (10), this becomes

$$\Pr(e_1 = S_1) = \begin{cases} \Pi + (1-\Pi)G[\beta(\bar{R} + V_0)] & if \quad \Delta < h \\ \Pi + (1-\Pi)(G[\beta((1-\pi)\bar{R} + V_0)](1-\pi) + \pi) & if \quad r < h < \Delta \\ \pi & if \quad h < r \end{cases} \quad (12)$$

For period-2 welfare, $\Pr(e_2 = S_2) = \Pr(E_2 = S_2)\phi^G + (1 - \Pr(E_2 = S_2))(1 - \phi^B)$. Thus, we have

$$\Pr(e_2 = S_2) = \begin{cases} \Pr(E_2 = S_2) & if \quad \Delta < h \\ \Pr(E_2 = S_2)(1-\pi) + \pi & if \quad r < h < \Delta \\ \pi & if \quad h < r \end{cases} \quad (13)$$

Now (11), (12), and (13) can be used to compute $\Pr(e_1 = S_1) + \beta \Pr(e_2 = S_2)$ in each case.

Comparing these establishes the results.

Proof of Proposition 3. (i) This is easily shown by differentiating (10) with respect to π and using the fact that $G' > 0$. (ii) To show this, differentiate (11) with respect to π. (iii) Compute voter welfare as $\Delta(\Pr(e_1 = S_1) + \beta \Pr(e_2 = S_2))$ using (11), (12), and (13), and differentiate with respect to π to obtain the result.