Civil Service and the Growth of Government[*]

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Abstract

I study a model of elections which links the scale of government activity to civil service rules. Without tenure protections, bureaucrats' career prospects are tied to the electoral prospects of the party that hires them. To avoid wasteful partisan spending, voters only consent to minimal taxation. If bureaucrats are protected by tenure, they have no incentive to favour one party over another, and governments only produce public goods. In turn, voters consent to high taxes. However, because higher tax revenues increase the ability of governing parties to co-opt the bureaucracy through favourable compensation, large-scale government activity is accompanied by inefficiently high public-sector wages.

JEL Classification: H11; D73; H41

1   Introduction

The late 19th and early 20th centuries saw important changes in the structure of democratic governments. First, multiple rounds of reforms to the civil service depoliticised government personnel practices. Initial efforts typically established a merit system,

imposing that government employees be hired for their formal qualifications and performance in examinations as opposed to their partisan connections. Later, tenure systems protecting civil servants from politically motivated dismissals were codified. In the United States, a merit civil service was established by the 1883 Pendleton Act and gradually extended to cover most federal employees over the following decades. An executive order by President McKinley in 1897 established limited protections against dismissals, which were passed into law by the Lloyd-LaFollette Act of 1912 (Van Riper, 1958).[1] Second, both the scale and scope of government activity expanded dramatically, with new roles for government in public education, old-age pensions, unemployment insurance and other welfare state programs. In this paper, I develop a model that connects these two observations by focusing on how the institutions that shield government workers from partisan interference affect voters' willingness to fund government spending.

My model delivers a number of key insights. First, although voters demand public goods, they understand that these are supplied through interactions between governing parties and the bureaucracy, which they can only partially monitor. Governments can exploit personnel decisions to induce bureaucrats to promote their reelection using public resources, so that additional layers of civil service protections enhance voters' trust that tax revenue will be spent effectively. Thus, the progression of civil service systems from patronage to merit to tenure leads voters to prefer successively higher levels of government spending. Second, civil service regulations cut off some, but not all, personnel policies from politicians. Correspondingly, the remaining instruments, such as salaries and other forms of compensation, adjust to new institutional constraints. Third, civil service rules never eliminate all distortions in public goods provision: rather, they shape the nature of these inefficiencies. On the one hand, untenured bureaucracies under-provide public goods, but bureaucrats' wages are controlled by politicians' power to dismiss them. On the other hand, tenured bureaucracies can produce the efficient level of public goods, but at the cost of inflated wages. Therefore, voters have legitimate, but distinct, complaints about government services under all civil service systems.

I introduce a dynamic model of two-party elections where the governing party delegates tax revenue to the bureaucracy, which can spend it on public goods or divert it

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[1]Despite significant national differences, other English-speaking countries followed a similar pattern. See, e.g., Kingsley (1944) for the United Kingdom and Juillet and Rasmussen (2008) for Canada.

to partisan expenditures that influence the voters' reelection decisions. I assume that bureaucrats are selected by merit, in that they have the expertise to produce public goods at no cost and have no inherent preference for one party over the other. Indeed, because bureaucrats hired through an apolitical process should have neither the desire, the skills nor the obligation to distort spending to promote the government's reelection, I assume that they can engage in such spending only if they make costly partisan investments. Therefore, in equilibrium, partisan spending by the bureaucracy must be supported by endogenous preferences for the incumbent's reelection that are strong enough to overcome these partisan investment costs. A governing party generates these preferences by promising high wages to the bureaucracy if it is returned to power. Some components of the model can easily be made more general, as discussed in Section 7 following the presentation of my main results. For example, I show that all my results are preserved if bureaucrats have only limited discretion over government spending. What is essential is that bureaucrats retain the ability to shirk by wasting government revenue. In contrast, other components are critical for my results. For example, I show that a civil service system with neither merit nor tenure cannot support even the partial provision of public goods. However, public goods can be provided efficiently if the relationship between politicians and bureaucrats is sufficiently transparent that bureaucrats' spending decisions cannot influence voters' choices in elections.

Both supporters and opponents of civil service reforms worried about negative outcomes associated with tenure, such as its impact on bureaucrats' incentives for effort (Van Riper, 1958). Some reformers even argued that a properly functioning merit system would make tenure unnecessary: if politicians cannot distribute the positions of dismissed bureaucrats to political allies, then why dismiss them inappropriately in the first place?[2] In Section 4, I study untenured bureaucracies and find support for the conclusion that merit systems can, on their own, limit the partisan use of public funds. However, an important qualifier is that governing parties can benefit from job insecurity in the bureaucracy even if it is not staffed by their partisans. On the one hand, untenured bureaucrats lose their jobs if the governing party is not reelected, increasing their incentives to invest in partisanship. On the other hand, bureaucrats only gain

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[2]Van Riper (1958, p.102) reports this view that "if the *front-door* were properly tended, the *back-door* would take care of itself."

from these partisan investments if the government controls enough resources for political spending to have an important electoral impact. Therefore, selection by merit eliminates partisan preferences in the bureaucracy, but it cannot keep bureaucrats from making partisan investments if the scale of government activity is large. In Section 5, I study tenured bureaucracies and show that, to completely insulate bureaucrats from partisanship, control over their career paths must be wrested from politicians as well.[3] Tenured bureaucrats have no incentives make partisan investments because they are retained regardless of electoral outcomes and, in equilibrium, they expect the same wages from all parties. Therefore, tenure overcomes the ceiling on nonpartisan government spending imposed by a merit system alone. Correspondingly, all government revenue net of bureaucratic compensation is spent on public goods.

Job security also affects bureaucratic wages. First, the wages of both tenured and untenured bureaucrats are minimised when governments are small. For untenured bureaucrats, this reflects the fact that governing parties prefer to compensate their workers generously only if they make themselves useful electorally. Second, when governments are large, tenured bureaucrats receive high wages even if, contrary to untenured bureaucrats, they make no partisan investments that require compensation. While untenured bureaucrats working for large governments are paid because they are successfully coopted, tenured bureaucrats must receive wages high enough to defeat all such attempts. Third, because better-funded governments can more easily induce bureaucrats to make partisan investments, the wage cost of keeping partisanship at bay under a tenure system is growing in government size. This contrasts with the wages of untenured bureaucrats in large governments, which are declining in government size. In that case, increased government resources mean that partisan spending has a higher impact on governing parties' reelection, so that bureaucrats still have incentives to invest in partisanship even if they receive lower wages.

Available evidence suggests that the real wages of government employees declined following the Pendleton Act (Van Riper, 1958). As the public sector was modest in size during the 1880s, this is in line with my finding that untenured bureaucracies' wages are

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[3]As described by Libecap and Johnson (1994, p.51): "To preserve the advantages offered by the merit service, both tenure provisions to reduce the use of threats of dismissal as a means of manipulation and requirements for political neutrality to reduce the value of federal employees for partisan purposes were gradually incorporated into civil service rules."

lowest when governments are small.[4] Bureaucratic wages started growing again when the bureaucracy was further insulated from politics and tenure became more common (Van Riper, 1958). As this period also saw marked increases in government spending, this is in line with my result that the wages of tenured bureaucrats increase in government size. Of course, tenure went hand in hand with the growth of public-sector unions. It is important to note that explanations of the generosity of government workers' compensation that rely on union power versus those that rely on the requirements of nonpartisan spending are not mutually exclusive. While improved compensation and working conditions were key objectives for the unions, they were also reliable opponents of patronage. For example, the unions mostly supported the Hatch Act of 1938 which banned political activities by all federally funded workers, stripping them of fundamental speech rights (Van Riper, 1958, p. 342). Furthermore, it was recognized that union intervention in personnel practices could contribute to combat patronage. For example, the early labour economist John R. Commons argued that unionisation "is a protection for the [civil] service against one of the greatest evils by which public employment is menaced in democratic communities; namely, the interference of the politician." (Commons, 1913, p.67) Also, some legislators supported public-sector unionisation in part to limit the executive branch's opportunities for patronage. For example, Senator LaFollette's drive to pass legislation protecting union activity in the public sector was spurred in part by having been deprived of patronage appointments by President Taft in intra-party feuds (Skowronek, 1982, p.191).

My final main results in Section 6 address the question of when voters would prefer a tenured bureaucracy. I show that this happens when the benefits from the public goods that only politically insulated bureaucrats can provide overcome the wage costs of producing them. Thus, as noted in my first paragraph, civil service reform and the scale of government activities are tightly connected, and their underlying predictor is the electorate's demand for public goods. This is in line with historical studies of civil service reforms, which stress how the politically subservient bureaucracies of the 19th and early 20th century could not adequately fulfill the new tasks that citizens were

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[4]In reporting this growing private-public pay gap in the early 20th century, Van Riper (1958, p.156) suggests that "the placing of a number of [...] positions under the merit system was followed by a decline of congressional interest in these positions which were no longer of value for the purposes of party spoils".

pressuring their governments to undertake.[5]

1.1 Related Literature

As noted by Gailmard and Patty (2007, p.875), tenure is a puzzling institution, in that it is much easier to explain why it should not be observed than why, for public-sector workers, it is widespread. To this end, I abstract from the better-known agency problems of tenure systems by assuming that bureaucrats can produce public goods at no cost. On the one hand, this means that my results provide an optimistic upper bound to the value of tenure protections. In turn, the tightness of this bound depends on the effectiveness of high-powered incentives in government and the extent to which bureaucrats are motivated by a sense of mission or public service, which limits their willingness to shirk legitimate demands of voters and their representatives (Brehm and Gates, 1999; Francois, 2000; Besley and Ghatak, 2005). On the other hand, this strengthens one of my main results: inefficiencies in public goods provision persist even if public-spirited bureaucrats are protected from partisan dismissals.

My model's explanation for favourable working conditions in the public sector is consistent with findings of a public-private wage gap in many countries (Gregory and Borland, 1999). In some ways, the compensation of tenured bureaucracies resembles an efficiency wage, in which bureaucrats obtain rents in exchange for good behaviour (Shapiro and Stiglitz, 1984). But this is inconsistent with my assumptions that merit-selected and tenured bureaucrats need no incentives to produce public goods and cannot be dismissed. Among efficiency-wage theories, the closest analogues are those suggesting increased compensation for public employees to counter corruption (Becker and Stigler, 1974; Besley and McLaren, 1993). However, in my model bureaucrats' wages constrain the bribes that their employer, as opposed to their clients, can offer them. Finally, my explanation of inflated bureaucratic wages does not rely on bureaucratic rent-seeking (Tullock, 1965; Niskanen, 1975; Marconi et al., 2009), manipulation of government employment for redistribution (Alesina et al., 2000) or collective bargaining (Fernández-de Córdoba et al., 2012). That is not to say that moral hazard problems associated with permanent bureaucracies do not play a role in my results. A seemingly puzzling ques-

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[5]For the United States, see Libecap and Johnson (1994) and Rauch (1995); for the United Kingdom, see Orloff and Skocpol (1984); for Canada, see Juillet and Rasmussen (2008).

tion is why governing parties would agree to overpay tenured bureaucrats who refuse to invest in partisanship. The reason is that any government that tries to scale back public-sector wages would face shirking from bureaucrats who expect the opposition party to compensate them more generously. In other words, while my results attribute the origins of bloated government wages to the need to maintain bureaucrats' political neutrality, the results also explain the persistence of these inflated wages through the power over governments' electoral prospects that tenure grants the bureaucracy.[6]

An important rationale for introducing tenure protections is that they increase the quality of government production. In Gailmard and Patty (2007), tenure provides incentives for bureaucrats to invest in policy-making human capital. The value to tenure in my model is different but complementary. In their case, job insecurity depresses bureaucrats' returns from acquiring expertise. In my case, it leads to pressure for investments in partisanship that prevent bureaucrats from applying the policy-making expertise they already have. In both cases, tenure brings more benefits to voters as the scale and complexity of the services they demand from government require more expertise. Related arguments apply when government production itself involves investments, in which case a permanent bureaucracy can alleviate the intertemporal commitment problems of shortsighted politicians (Horn, 1995; Rauch and Evans, 2000).

Instituting tenure protections can also benefit politicians. Ting et al. (2013) show that governments that expect to lose power have an incentive to reform the civil service to keep an important partisan tool away from their replacements.[7] While short-term tactical considerations are clearly important to explain the precise timing of civil service reforms, they also generate incentives for dismantling civil service systems, which has more rarely been observed (Libecap and Johnson, 1994; Horn, 1995).[8] Libecap and Johnson (1994) argue that growth in government size meant that the executive branch benefited from reducing the transaction costs associated with a partisan bureaucracy,

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[6]The importance of bureaucratic sabotage for government outcomes, and corresponding incentives for governments to cultivate the bureaucracy's goodwill, is documented both in the academic literature (Brehm and Gates, 1999) and in the popular press (e.g., "Revenge of the bureaucrats", Politico, 23/01/2017, https://www.politico.com/story/2017/01/trump-government-bureaucrats-234019).

[7]Huber and Ting (2016) show that electorally disadvantaged parties may also invest in nonpartisan bureaucracies if they expect future governments to exploit their expertise to produce public goods.

[8]In other countries, the adoption of merit and tenure systems was less staggered. For example, in Canada the 1882 Civil Service Act instituted a limited merit system, until in 1918 the next Civil Service Act generalised both merit and tenure to the whole bureaucracy (Juillet and Rasmussen, 2008).

while the legislative branch benefited from the reduced oversight costs of having a bureaucracy that is politically independent from the executive.

Closely related to my paper are tenure explanations that discuss how it affects voter welfare through policy quality and electoral performance. Ujhelyi (2014) shows that tenure can benefit voters by giving good bureaucrats the power to thwart the policies of bad politicians. The corresponding downside is that bad bureaucrats can then sabotage the policies of good politicians. As noted above, bureaucratic shirking also plays an important, but very different, role in my model: it serves as a threat which, while never used in equilibrium (on this see Section 3, which presents preliminary results), supports tenured bureaucrats' inflated wages. Ujhelyi (2014) also shows that bureaucrats' interventions in policy making can distort voters' information about the incumbent.[9] In my model, tenure always improves government selection by eliminating the partisan spending that distorts electoral outcomes.

2   Model

Below, I present the simplest version of my model. Then, in Section 2.1, I discuss some of my key modelling assumptions. Throughout, I preview some of the extensions to the basic model that are presented in Sections 6 and 7.

Players.   Two parties, -1 and 1, compete for control of the government in periods $t = 1, 2, ...$ The governing party in each period t, P_t, is chosen through an election decided by a single voter. In all periods, the public service is staffed by a continuum of both junior and senior bureaucrats, with the mass of each wing of the bureaucracy normalised to $1/2$. Bureaucrats live for two periods, and there are overlapping generations of potential bureaucrats. All bureaucrats of a given age have identical preferences. Furthermore, I abstract from collective action problems within the bureaucracy by assuming that all bureaucrats of a given age take identical actions.

Tenure.   Senior bureaucrats retire at the end of their term, but the promotion of junior bureaucrats depends on the existence of tenure protections. With tenure, the bureaucracy is insulated from electoral outcomes, so junior bureaucrats are always

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[9]In a related paper, Forand and Ujhelyi (2018) study the effects on voter welfare of bans on government workers' political speech.

promoted. Without tenure, junior bureaucrats are only promoted if the governing party they serve is reelected. As party-specific retention rules maximise politicians' power over the bureaucracy, these rules are optimal if the hiring of untenured bureaucrats is endogenous, as explained in Section 7.2.

Government revenue. In all periods, the governing party has access to tax revenue $T \geq 0$, which serves as a measure of *government size*. I treat T as exogenous, and my results focus on how the voter's preferences over government size depend on tenure protections. In Section 6, I show that if tax revenue is determined by electoral competition, then there is an equilibrium in which both parties commit to the voter's ideal government size (and to his preferred tenure policy) in all periods.

Government spending. Government spending is divided between public goods, partisan goods and compensation for the bureaucracy. In any period t, if the opposition party from $t-1$ takes office, then it commits to bureaucratic wage bill w_t for all of its tenure in office. I assume that the government cannot differentially remunerate bureaucrats so that, given my normalisation of the size of the bureaucracy, the per-capita wage of any bureaucrat is also w_t. The remaining tax revenue net of bureaucratic compensation, $T - w_t$, is spent at the bureaucracy's discretion. For simplicity, I assume that only junior bureaucrats participate in government production.[10] Junior bureaucrats can direct tax revenue either to the provision of public goods, which generate economic benefits for the voter, or to the production of partisan goods, which generate electoral benefits for the governing party: $X_t \geq 0$ is allocated to the provision of public goods and $Y_t \geq 0$ to partisan goods. Spending plan (X_t, Y_t) is *feasible* if it satisfies the government's spending constraint, $X_t + Y_t \leq T - w_t$, and if also $X_t, Y_t \leq \overline{T}$, where $\overline{T} > 0$ is an upper bound on public spending. As explained below, $\overline{T}$ parametrises the voter's demand for public goods.

Government production. Both public and partisan goods are produced through constant returns to scale technologies: given spending plan (X_t, Y_t), the quantity of public goods produced is X_t and the quantity of partisan goods produced is $\theta_t Y_t$. I assume that $\theta_t \in \{\overline{\theta}, \underline{\theta}\}$, which is the productivity of partisan spending, is i.i.d. over time: $\mathbb{P}(\theta_t = \overline{\theta}) = q$ for all t. My results rely on variability in the relative productivity of

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[10]The incentives of senior bureaucrats are simple: they would spend any resources delegated to them on public goods. This additional public goods production would benefit the voter, but all my results would be qualitatively identical.

partisan and public goods spending, so I assume that $\underline{\theta} < 1 < \overline{\theta}$. If $\theta_t = \overline{\theta}$, I say that partisan spending is *effective*, while if $\theta_t = \underline{\theta}$, I say that it is *ineffective*.

Voter's payoffs. The voter benefits from public goods spending, bears costs from the taxation required to finance it, and values the governing party's quality, or valence. The voter's payoff at t is

$$U_t = X_t - \Psi T + \Phi_t^{P_t},$$

where $\Psi > 0$ is the cost of raising tax revenue and $\Phi_t^{P_t}$ is the valence of the governing party. I assume that $\Psi < 1$, so that the voter always benefits from additional public goods spending. Recalling the bound $\overline{T}$ on government spending, it follows that the voter's ideal level of public goods provision, which I call his *demand for public goods*, is $\overline{T}$. Finally, the voter discounts future payoffs with factor $0 \leq \delta_v < 1$.

Notice that the voter does not benefit from partisan goods. However, if partisan spending only occurs when it is effective, then public goods are produced when this spending is ineffective.

Assumption 1. $1 - q < \Psi$.

Assumption 1 says that producing public goods only if partisan spending is ineffective does not compensate the voter for the cost of the associated taxation. The lefthand side of the inequality is the voter's marginal benefit from this partial provision of public goods. The righthand side is his marginal cost of supplying tax revenue.

Elections. The voter decides whether to reelect the governing party after observing a coarse measure of government performance. The voter cannot separately monitor bureaucrats' compensation, spending on public and partisan goods, the productivity of partisan spending, and the valence of the governing party. Instead, at time t the voter observes the performance signal

$$Z_t = X_t + \theta_t Y_t + \Phi_t^{P_t}.$$

Partisan spending influences the voter's electoral decisions because he confounds it with the governing party's valence: even if a high realisation of the performance signal could be due to effective partisan spending, the voter rationally attributes this in part to high valence because he does not observe the productivity of partisan spending.

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However, for the voter to have incentives to use elections to select high-valence parties, the performance signal must also provide information about the governing party's future valence. Correspondingly, I assume that a party's valence has some persistence: $\Phi_t^{P_t} = \phi_t^{P_t} + \phi_{t-1}^{P_t}$, where $\phi_t^{P_t}$ and $\phi_{t-1}^{P_t}$ are independent and distributed uniformly on $[-\tilde{\phi}, \tilde{\phi}]$, with $\tilde{\phi} > 0$. Finally, to simplify the linkages between periods and to avoid signaling incentives for parties, I assume that no player knows $\phi_t^{P_t}$ in period t but that it is publicly observed at the beginning of period $t + 1$.[11]

Parties' payoffs. Parties are office-motivated: they obtain a utility of 1 if in office and 0 if in opposition. Parties discount future payoffs with factor $0 \leq \delta_p < 1$.

Bureaucrats' payoffs. The first component of bureaucrats' payoffs stems from career concerns and is independent of the decisions they make in office: all employed bureaucrats receive utility $u(w_t)$ from wage w_t, where $u(0) = 0$, $u' > 0$ and $u'' < 0$. To simplify some of my results, I assume further that u has constant absolute aversion to risk: $u(w_t) = 1 - e^{-aw_t}$, where $a > 0$.[12] Bureaucrats also have preferences over government production per se, and my key assumption is that they bear costs from partisan spending but not from public goods spending. Specifically, after observing the wage w_t offered by the governing party, junior bureaucrats can invest in partisanship. Let $k_t \in \{0, K\}$ denote their investment decision, where $K > 0$ is the cost of acquiring the ability to engage in partisan spending. After making their partisan investments, junior bureaucrats observe the productivity of partisan spending and make their spending decisions, but only bureaucrats who have invested in partisanship can use tax revenue to help the incumbent. Thus, a feasible spending plan (X_t, Y_t) must be such that $Y_t > 0$ only if $k_t = K$. Finally, junior bureaucrats discount future payoffs with factor $0 \leq \delta_b \leq 1$.

2.1 Comments on Key Modelling Assumptions

Bureaucrats' compensation. While civil service systems typically include rigid job classification rules and wage scales, office holders retain significant control over base salaries, benefits and the quantity and quality of jobs available in government. In OECD countries the overall compensation of government workers is typically determined through

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[11]This approach follows Rogoff (1990).

[12]I make it clear in the Appendix when my results depend on this assumption.

collective bargaining. Even in the United States, where collective bargaining is not universal, public-sector unions retain some power to negotiate working conditions with politicians on behalf of bureaucrats (Traxler, 1994). Therefore, while strict rules prevent politicians from targeting the career outcomes of any one bureaucrat, they have many tools with which they can affect the attractiveness of government jobs as a whole. Furthermore, there is evidence that politicians use these tools to their advantage. For example, Matschke (2003) shows that bureaucratic wages respond to electoral cycles, which Borjas (1984) explains through governments' attempts to stimulate bureaucracts' public goods production ahead of upcoming elections.

Selection by merit. I assume that bureaucrats are more adept at providing public goods than partisan goods. This assumption captures the two key features of merit systems. First, bureaucrats should have the skills necessary to perform their tasks. For example, the qualifying examinations mandated by the Pendleton Act seem to have imposed nontrivial barriers to entry: Libecap and Johnson (1994) report that these exams had success rates around 60 percent in their early years. Second, the links between government employees and party organisations that facilitate partisan spending should be severed. For example, the Pendleton Act also banned the practice of "assessments", through which government employees had to deliver a fraction of their salaries to the party that appointed them. In my model, the partisan disconnect between politicians and bureaucrats is captured by the investment cost K. In Section 7.1 I show that if bureaucrats require no incentives to divert resources from public goods spending, then the voter's preferred government size is $T = 0$. Note that I only assume that bureaucrats bear costs from distorting spending in ways that help incumbents get reelected. However, bureaucrats bear no costs from simply wasting tax revenue by not spending on public or partisan goods: in equilibrium, such shirking by bureaucrats would hurt incumbents' electoral prospects.

Elections and partisan spending. The voter is influenced by partisan spending because he wants to reelect high-valence parties but cannot identify party quality from government performance. In Section 7.4, I show that all inefficiencies in public goods spending disappear if either of these electoral concerns are eliminated. A literal interpretation of my model is that partisan goods are pure waste from the voter's point of view. In this case, partisan spending would represent bureaucrats using their proximity to voters to

propagandise the achievements of the governing party. But partisan goods can also be interpreted as resulting from wasteful public spending that benefits *some*, but not *all*, voters. For example, consider a public infrastructure program that can allocate projects to a number of constituencies. Those with the most economically justified claims need not be the constituencies in which additional public spending would generate the highest electoral return for the government. If a representative constituency could not evaluate the quality of infrastructure projects, it would approve of the program if it could trust the bureaucracy to use cost-benefit analysis to allocate projects, but not if it expected funds to be diverted to politically expedient constituencies.

Assumption 1 says that voters would refuse to fund governments that produce partisan goods. It seems natural to assume that the opportunity cost of putting tax revenue to partisan use is high, and that furthermore this cost is increasing in government size. First, voters seem to have little appetite for government spending that puts political priorities over economic ones.[13] Second, the scale and scope of modern public service provision magnifies the potential costs of misallocation.[14] In Section 5 of the Supplementary Appendix, I extend my results to the case in which Assumption 1 fails.

2.2   Strategies and Equilibrium

Given government size T, a *stationary and symmetric strategy profile* consists of the following.

1. A *wage strategy* for parties is $\omega^*(T) \in [0, T]$. Recall that governing parties commit to wages for their entire tenure, so that a wage strategy only specifies the choices of newly elected governing parties.

2. A *partisan investment strategy* for junior civil servants is $\kappa^*(T, w) \in \{0, K\}$.

3. *Spending strategies* for junior civil servants are $\chi^*(T, w, k, \theta_t) \geq 0$ and $\gamma^*(T, w, k, \theta_t) \geq$

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[13]For example, Gadenne (2017) shows that Brazilian municipalities provide more public goods when the tax revenue is collected directly from their citizens. Another example is the general unpopularity of earmarks in the United States Congress.

[14]For example, Wallis et al. (2006) argue that the scarcity of scandals involving relief spending during the New Deal was due to the bureaucratisation of the administration of welfare to avoid political misallocations, the potential scale of which could have been fatal to these programs.

0, which specify feasible levels of spending on public and partisan goods, respectively.

4. A *reelection strategy* for the voter is $\rho^*(T, Z) \in \{0, 1\}$.

An *equilibrium* is a subgame perfect equilibrium in stationary and symmetric strategies. When there are multiple equilibria, I select *voter-optimal equilibria*: those that yield the highest ex ante payoff to the voter (among all equilibria for that government size T). Correspondingly, a *voter-optimal government size* T^* is such that no other government size admits an equilibrium yielding higher ex ante payoffs to the voter.

3 Preliminaries

Equilibrium outcomes in the final two stages of any period, namely junior bureaucrats' spending decisions and the voter's reelection decision, can be described without reference to whether bureaucrats have tenure.[15]

Proposition 1. *Fix any government size and any equilibrium.*

1. *If either (i) partisan spending is ineffective or if (ii) partisan spending is effective but junior bureaucrats do not invest in partisanship, then they devote all of their budgets to public goods.*

2. *If partisan spending is effective and junior bureaucrats invest in partisanship, then they devote all of their budgets to partisan goods.*

3. *Governments are reelected with probability ½.*

Taken together, parts 1 and 2 of Proposition 1 say that, conditional on their partisan investments, junior bureaucrats spend tax revenue to maximise the governing party's probability of reelection. The model does not rule out junior bureaucrats preferring that the incumbent party loses the election. For example, if junior bureaucrats expect to keep their jobs and to have strictly higher wages under an opposition-led government, then it is optimal for them to shirk and waste all tax revenue. However, Proposition 1

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[15]To ease the presentation, I restrict the statements in the text to players' actions on the equilibrium path, but the proofs of my results in the Appendix derive the full equilibrium strategies.

says that such threats of sabotage are never carried out on the equilibrium path and junior bureaucrats always weakly prefer the governing party. Proposition 1 is silent on whether junior bureaucrats have incentives to invest in partisanship, which requires them to have strict preferences for the incumbent. As shown below, whether this is possible depends on tenure.

Part 3 of Proposition 1 says that while the voter can be duped ex post by partisan spending, incumbents do not gain ex ante if bureaucrats invest in partisanship. The voter reelects the incumbent party if the performance signal he receives exceeds the signal he expects given the strategies of parties and bureaucrats. If the voter does not expect partisan spending in equilibrium, then the governing party's performance exceeds expectations if and only if it is of above-average quality. In this case, the voter elects governments efficiently. If the voter expects partisan spending in equilibrium, then electoral selection is distorted. When partisan spending is effective, some lower-valence governments defeat higher-valence opposition parties. When partisan spending is ineffective, some higher-valence governments are replaced by lower-valence opposition parties. However, the voter anticipates both these effects and they offset each other ex ante.

4   Untenured Bureaucrats

The key remaining question is how governing parties leverage promises of future compensation to induce bureaucratic investments in partisanship. Clearly, the impact of such wage promises are highest without tenure, because junior bureaucrats only keep their jobs if the government is returned to power. Co-opting wages, which provide incentives for partisan investments, satisfy a simple incentive constraint for bureaucrats. Expressing this constraint requires an additional piece of notation: given a wage w set by the governing party along with a partisan investment decision k by junior bureaucrats, let $\mathbb{P}^*(T, w, k)$ be the expected reelection probability of the governing party, which is computed using equilibrium spending and voting strategies (from Proposition 1) and where the expectation is with respect to the shocks to partisan spending productivity and governing party valence. A co-opting wage w must satisfy

$$\delta_b \left[\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0) \right] u(w) \geq K. \tag{1}$$

First, co-opting wages cannot be too low because junior bureaucrats are only partisan if the compensation they expect from a reelected governing party is attractive enough relative to unemployment (i.e., (1) fails if $w \approx 0$ because $u(0) = 0$). Second, co-opting wages cannot be too high without leaving too little tax revenue for bureaucrats to successfully tip electoral outcomes by investing in partisanship (i.e., (1) fails if $w \approx T$ because $\mathbb{P}^*(T, T, K) - \mathbb{P}^*(T, T, 0) = 0$). These two facts together say that to induce partisanship, the governing party must have enough resources at its disposal to target both bureaucrats and voters. Formally, this implies that there exists a government size $\tilde{T} > 0$ such that a wage w satisfying the incentive constraint (1) exists if and only if $T \geq \tilde{T}$. This threshold government size $\tilde{T}$ plays a key role in my results both with and without tenure. If $T > \tilde{T}$, then there is a range of wages that satisfy the incentive constraint (1) (if $T = \tilde{T}$, then there is only one such wage). The governing party clearly prefers offering the lowest of all such wages: junior bureaucrats still invest in partisanship and more tax revenue is available to influence the voter. Correspondingly, for all $T \geq \tilde{T}$, let $\underline{w}^{K,n}(T)$ denote the *minimal* wage that satisfies (1).[16]

If government size exceeds $\tilde{T}$, do parties have the incentives to offer the minimal co-opting wage $\underline{w}^{K,n}(T)$? This depends on a condition ensuring that partisan spending yields sufficient electoral benefits to governing parties. To derive this condition, we have reduced the wage-setting problem of governing parties to the following two options: (i) divide tax revenue between the minimal co-opting wage bill $\underline{w}^{K,n}(T)$ and public spending $T - \underline{w}^{K,n}(T)$, which is partisan if this spending is effective, and (ii) set $w = 0$ and devote all tax revenue to public goods spending.

Assumption 2. $\tilde{T} < \overline{T}$ *and*

$$q[\overline{\theta} - 1]\left[\tilde{T} - \underline{w}^{K,n}(\tilde{T})\right] > \underline{w}^{K,n}(\tilde{T}). \tag{2}$$

Assumption 2 ensures that option (i) is optimal for all $T \geq \tilde{T}$. The lefthand side of (2) captures the expected electoral benefit of a partisan bureaucracy. This benefit is high if partisan spending is likely to be effective, if effective partisan spending has a large productivity advantage over public goods spending, and if enough tax revenue remains for partisan goods net of bureaucratic wages. The righthand side of (2) captures the

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[16]For a formal definition, see (13) in the Appendix.

electoral cost of a partisan bureaucracy, which consists of the public goods production foregone to fund bureaucratic compensation. For parties to have the incentive to offer the minimal co-opting wage for any government size $T \geq \tilde{T}$, it is sufficient that (2) holds only at $\tilde{T}$. As explained below, wage $\underline{w}^{K,n}(T)$ is decreasing in government size, which implies that the expected electoral benefit of partisan bureaucracies increases in T, whereas their electoral cost declines in T. I can now complete the description of equilibria with untenured bureaucracies.

Proposition 2. *Suppose that bureaucrats do not have tenure.*

1. *Given any government size $T \leq \tilde{T}$ and any equilibrium, junior bureaucrats receive wage $\omega^*(T) = 0$ and do not invest in partisanship.*

2. *Given any government size $T > \tilde{T}$ and any equilibrium, junior bureaucrats receive wage $\omega^*(T) = \underline{w}^{K,n}(T) > 0$ and invest in partisanship. Furthermore, the bureaucratic wage is decreasing in government size.*

3. *The voter-optimal government size is $T^* = \tilde{T}$.*

Part 1 of Proposition 2 says that small governments insulate bureaucrats from political pressure even if their retention is controlled by politicians. In this case, all tax revenue is spent on public goods which, although underprovided (because production T does not attain the voter's demand $\overline{T}$), are produced at minimum cost (because bureaucrats receive wage $\omega^*(T) = 0$). Because the voter is willing to fund public goods, his preferred government size among those that leave no room for partisan distortions is $T^* = \tilde{T}$.

Part 2 of Proposition 2 says that bureaucrats' lack of job security introduces distortions in spending when government resources are large. In this case, the carrot of favourable compensation combined with the stick of partisan retention are powerful enough to induce bureaucrats to invest in partisanship. Public goods are produced only when partisan spending is ineffective. The voter would be unwilling to fund such spending even if bureaucrats did not extract any compensation from governing parties in exchange for their partisan investments (from Assumption 1). This means that no government size too large to prevent partisan distortions is preferred to $\tilde{T}$.

From the discussion surrounding bureaucrats' incentive constraint (1), it follows that $\tilde{T}$, the highest level of public goods that a merit-selected, but untenured, bureaucracy can provide free of partisanship, is increasing in the investment cost K. This says that a merit system's contribution to public goods provision is increasing in the scale of the barriers that it puts between incoming bureaucrats and party organisations. Also, $\tilde{T}$ is decreasing in both the likelihood q and level $\bar{\theta}$ of effective partisan spending productivity.[17] This says that merit systems have more difficulty protecting government programs that are easier to manipulate. These could be programs that are more visible to voters, or those whose implementation is more complex, so that bureaucrats can use their expertise to attribute the policy outcomes observed by voters to governing parties.

The grey line in Figure 1 illustrates the wages of untenured bureaucrats as a function of government size. Without tenure, governing parties leverage their power over bureaucrats' careers to minimise their compensation whether they invest in partisanship are not. On the one hand, if the alternative to the government's survival is unemployment, then even nonpartisan bureaucracies can be kept from shirking at no cost: if $T \leq \tilde{T}$, then the equilibrium wage (which is 0) maximises both public goods provision and the government's reelection probability. On the other hand, a partisan bureaucracy must be compensated but has no power to extract rents: if $T > \tilde{T}$, then bureaucrats receive a positive wage but are indifferent between investing in partisanship or not. Because of the complementarity of compensation and government spending in bureaucrats' incentives for partisanship, the gains from co-opting the bureaucracy increase in government size. Without tenure, these gains are captured by governing parties, and therefore the wages of partisan bureaucrats decline with government revenue.

5   Tenured Bureaucrats

How are junior bureaucrats' investments in partisanship affected by tenure protections? This can be understood through a simple incentive constraint identifying co-opting wages, which is closely related to (1) in the case without tenure. The key difference is that tenured bureaucrats must have an expectation of how a future opposition-led

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[17]Again, this follows from (1) when combined with equation (9) in the Appendix, which shows that $\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0)$ is increasing in both q and $\bar{\theta}$.
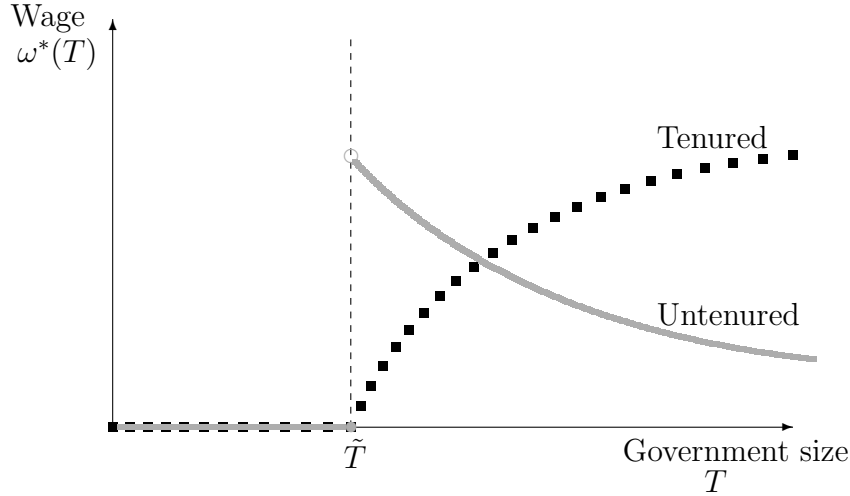
Figure 1: Equilibrium wages of untenured and tenured bureaucrats.

government would compensate them: this is provided by the equilibrium wage $\omega^*(T)$ (replacing a wage of 0 in this eventuality without tenure). Therefore, wage w provides junior bureaucrats with the incentives to invest in partisanship if

$$\delta_b \left[\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0) \right] \left[u(w) - u(\omega^*(T)) \right] \geq K. \tag{3}$$

An immediate implication of (3) is that tenure is incompatible with a partisan bureaucracy: in any equilibrium, it must be that $w = \omega^*(T)$, so that (3) is not satisfied. But if bureaucrats cannot receive co-opting wages in equilibrium, what wages are they offered? First, bureaucratic compensation must be tailored to counter the threat of partisanship: an equilibrium wage $\omega^*(T)$ must be high enough that (3) *fails* for all potential co-opting wages w.[18] Second, in a voter-optimal equilibrium, bureaucratic compensation cannot be so high that junior bureaucrats would still refuse to invest in partisanship even if they expected lower wages: a voter-optimal equilibrium wage $\omega^*(T)$ is the *minimal* wage with the property that (3) fails for all potential co-opting wages w.[19] Any lower equilibrium wage leaves bureaucrats open to some co-opting wage

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[18]One detail that needs to be verified is whether governing parties have the incentives to offer co-opting wages when these exist. I address this in the Appendix by exploiting Assumption 2, which played an analogous role in the case of untenured bureaucrats.

[19]For formal arguments supporting these two points, refer to the proof of Proposition 3 in the Appendix, and to equations (17) and (18) in particular.

offers. Any higher equilibrium wage ensures that no co-opting offers exist, but such a wage is overly generous to bureaucrats (in that there exist other equilibria with no partisan spending and lower wages). I can now complete the description of equilibria with tenured bureaucracies.

Proposition 3. *If bureaucrats have tenure, then, given any government size and any equilibrium, junior bureaucrats do not invest in partisanship.*

1. *Given any government size $T \leq \tilde{T}$ and any voter-optimal equilibrium, junior bureaucrats receive wage $\omega^*(T) = 0$.*

2. *Given any government size $T > \tilde{T}$ and any voter-optimal equilibrium, junior bureaucrats receive wage $\omega^*(T) > 0$. Furthermore, the bureaucratic wage is increasing in government size.*

3. *The voter-optimal government size is either $T^* = \tilde{T}$ or $T^* = \overline{T} + \omega^*(\overline{T})$.*

Part 1 of Proposition 3 says that protecting the bureaucracy through tenure brings no added benefits to the voter if government revenue is small. As shown in Section 4, if $T \leq \tilde{T}$ then even untenured bureaucrats cannot be given incentives for partisan investments. In that case, governing parties could drive bureaucrats' wages down to their outside option of unemployment. But tenured bureaucrats who expect a wage of $\omega^*(T) = 0$ from all governing parties are similarly insulated from political influence, and all tax revenue is spent on public goods. As was the case without tenure, the voter's preferred government size in this case is $\tilde{T}$.

Notice that Part 1 of Proposition 3 says that inflated bureaucratic wages are not due to tenure per se. Rather, as Part 2 shows, high wages are a result of combining tenure with large governments $(T > \tilde{T})$. Because in this case spending is nonpartisan, voters clearly benefit relative to the corresponding case for untenured bureaucracies. However, public goods provision is inefficiently costly: bureaucrats extract positive compensation in exchange for exerting costless effort. In this case, bureaucratic rents are generated by the same force that drives partisan spending without tenure: high government revenue can overcome the agency problem within government, but now tenured bureaucrats capture these potential gains as a reward for nonpartisanship. Correspondingly, bureaucratic wages bill must increase in government size, as illustrated by the dotted line

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in Figure 1. In this case, higher tax revenue involves a tradeoff between enhanced public goods provision and inflated bureaucratic compensation. However, because the wage $\omega^*(T)$ is strictly concave for $T > \tilde{T}$, it follows that the voter's marginal cost to public goods provision is declining in government size.[20] Therefore, the voter-optimal government size with an overpaid bureaucracy has full public goods provision (the voter's demand $\overline{T}$ for public goods is met, at cost $\overline{T} + \omega^*(\overline{T})$).

Without tenure, both parties deal with the bureaucrats under their control independently, but a permanent bureaucracy's performance for the governing party depends on the treatment it expects from the opposition party. Given any government size T and any equilibrium, the governing party cannot set a wage lower than $\omega^*(T)$ without inducing junior bureaucrats to shirk in the hope of bringing the opposition to power. Therefore, even if those equilibria that maximise the voter's payoff must minimise bureaucratic wages, equilibrium multiplicity through expected future compensation is a robust feature of the model with tenure. This points to an interesting relationship between tenure protections and the sources of downward pressure on bureaucrats' compensation. Without tenure, parties' control of retention caps bureaucratic wages, whether bureaucrats invest in partisanship or not. With tenure, the bureaucracy never brings any political benefits to incumbents, but parties cannot reduce their wages without suffering electoral costs. Correspondingly, constraints on bureaucratic compensation can only come from voters' equilibrium expectations.

6   Voter-Optimal Tenure Systems

It follows from Propositions 2 and 3 that, restricting attention to voter-optimal government sizes, the voter cannot be made worse if bureaucrats are granted tenure. Whether he is made strictly better off depends on the size of his demand for public goods.

Proposition 4. *There exists a demand for public goods $\check{T} > 0$ such that the voter strictly prefers a tenured bureaucracy if and only if $\overline{T} > \check{T}$.*

Notice that $\tilde{T}$, the highest tax revenue that leaves the government sufficiently underfunded so that politicians cannot co-opt bureaucrats, is determined by the incentive

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[20]Relatedly, in Section 5 of the Supplementary Appendix, I show that the wages of untenured bureaucrats are convex for $T > \tilde{T}$, as illustrated in Figure 1.

constraint (1) for junior bureaucrats, which depends on their preferences (through K and u) and on the impact of partisan spending on governments' reelection (through q and θ). When the gap between $\tilde{T}$ and the voter's demand for public goods $\overline{T}$ is large enough, the voter opts for large-scale government services delivered jointly with bureaucratic bloat over restricted services delivered effectively. I illustrate the case in which $\check{T} > \tilde{T}$ in Figure 2. The grey line is the voter's expected utility from having a tenured bureaucracy provide public goods against minimal wages, plotted as a function of his demand for public goods: this increases if his demand for public goods is low and is constant when it exceeds $\tilde{T}$. Similarly, the dotted line is the voter's expected utility from having a tenured bureaucracy provide the maximal amount of public goods (which, again, is $\overline{T} + \omega^*(\overline{T})$). This coincides with the grey line if $\overline{T} \leq \tilde{T}$, and otherwise is a convex function of $\overline{T}$. If the voter's demand for public goods is moderate ($\tilde{T} < \overline{T} < \check{T}$), then minimising wages yields higher payoffs. However, maximising public goods provision is preferred if his demand for public goods is high ($\overline{T} \geq \check{T}$).
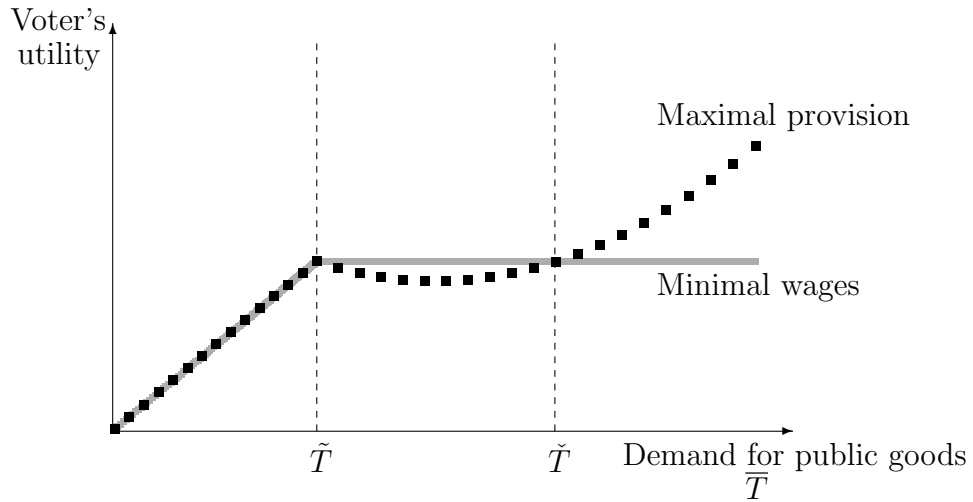
Figure 2: Voter's optimal utility from tenured bureaucracies with minimal wage costs and maximal public goods provision, in the case in which $\check{T} > \tilde{T}$.

So far, my results on voter-optimal levels of government revenue and civil service protections have treated them as exogenous. This turned out to be a fruitful approach, as it allowed a thorough analysis of the effects of both government size and tenure rules

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on the incentives of parties, bureaucrats and the voter. However, a natural question is whether voter-optimal governments should be expected to emerge from the electoral arena. Here, I show that if my model is extended to allow for partisan competition through both tax and tenure policies, then the answer is yes. Specifically, given any period t, consider the stage after the performance signal has been realised and the voter has made his inference about the incumbent's valence. Before the election is held, suppose that parties made simultaneous commitments about both the government size $T \geq 0$ and the bureaucratic tenure policy that they would implement if they were brought to power.

Proposition 5. *If parties compete through both government size and bureaucratic tenure rules, then there is an equilibrium in which both parties*

1. *commit to government size T^* in all periods, and*

2. *commit to bureaucratic tenure if and only if $\overline{T} > \check{T}$.*

This result reinforces the point that my model attributes the adoption of civil service protections to voter demands for higher scale and quality in public goods provision. Proposition 4 shows that the voter strictly prefers a tenured bureaucracy if his demand for public goods is high, while Proposition 5 verifies that competing parties can be made to deliver both public goods and a protected bureaucracy. This view of the origins of civil service systems is well known in the historical literature from Libecap and Johnson (1994). My results make additional contributions by clearly distinguishing the effects of different civil service rules like merit and tenure, as well as fleshing out novel relationships between these institutional rules and other personnel practices like compensation.

7   Discussion

In this section, I reinforce the main insights of the paper by discussing a number of extensions to my basic model.[21]

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[21]Formal statements and proofs are in the Supplementary Appendix.

7.1 Implications for Pre-Merit Bureaucracies

Prior to the establishment of merit systems, government jobs were allocated through preexisting relationships between politicians and potential employees. In my setting, this corresponds to allowing governing parties to select bureaucrats according to their partisan investment cost. In this case, governing parties select bureaucrats that require no incentives to work towards their reelection and, understanding this, the voter is unwilling to finance any government spending (i.e., parties hire bureaucrats with $K = 0$ and the voter-optimal government size is $T^* = 0$). An interesting implication of this result is that whether the voter benefits from a merit system depends on government size. If the government is small $(T \leq \tilde{T})$, then a merit system thwarts partisanship in the bureaucracy and promotes public goods provision. If government is large $(T > \tilde{T})$, the voter is better off with no civil service protections at all: merit and patronage appointees are both partisan but the latter need not be compensated for their political activities. In this case, the voter benefits from merit only if it is paired with tenure.

7.2 Incentives for Firing Untenured Bureaucrats

I capture the absence of tenure by assuming that bureaucracies turn over whenever governments do. But how does an incoming government benefit from firing the junior bureaucrats that served the defeated party? As equilibrium incentives are forward looking and incumbent bureaucrats are now senior and no longer have a partisan role, their replacement cannot be a punishment for past opposition. I address this by showing that party-specific turnover in untenured bureaucracies is an equilibrium outcome of a model in which bureaucrats are hired and fired at governing parties' discretion. In fact, bureaucratic turnover must occur in any equilibrium in which junior bureaucrats invest in partisanship (i.e., when $T > \tilde{T}$): a governing party never hires a junior bureaucrat at t that is slated to be hired as a senior bureaucrat by the opposition party at $t + 1$, as this drives up the incentive costs of partisanship. If bureaucrats cannot be induced into partisanship in equilibrium and hence receive a wage of 0 (when $T \leq \tilde{T}$), then governing parties do not need the threat of dismissal to constrain bureaucrats' wages. However, even in this case turnover remains optimal (although not uniquely so).

7.3 Limits to Bureaucratic Discretion

The high wages of tenured bureaucracies could not be sustained if governing parties had absolute control over the actions of their employees: even if governing parties could not compel bureaucrats to invest in partisanship, bureaucrats would be willing to provide public goods in exchange for lower wages. What portion of my results is due to governing parties' limited control over policy, in that they delegate all spending decisions other than compensation to the bureaucracy? To answer this, I show that the equilibrium outcomes of my model are identical to those of an alternative model in which all budgeting decisions, in particular whether to prioritise spending on public or partisan goods, are first made by politicians and then implemented by bureaucrats. On the one hand, this says that governing parties' control of bureaucratic wages is sufficient to curtail bureaucrats' policy discretion. Recall that, by Proposition 1, governing parties choose equilibrium wages such that bureaucrats with full discretion make spending decisions that maximise their reelection probability (conditional on partisan investments). Therefore, whether spending priorities are set directly by the government, or instead the government induces the bureaucracy to choose these priorities through a suitable wage policy, is irrelevant. On the other hand, this identifies the limits to politicians' power over the bureaucracy which are critical for my results: in order to compel governing parties to meet their inflated wage expectations, bureaucrats must be able to shirk without being monitored and/or disciplined by governing parties.

7.4 Eliminating Electoral Distortions

In my model, the voter's preferences over government size and the level of protection afforded to the bureaucracy are driven by the potential for politicians to misallocate tax revenue. In turn, governing parties try to distort public goods provision because partisan spending tilts elections in their favour. If the voter is better informed, in that he observes either parties' valence or the distribution of government production into partisan and public goods, then he cannot be influenced by partisan spending and, in voter-optimal equilibria, only public goods are produced. If instead parties' valence has no persistence, then the voter has no incentive to retain high-quality governments. Therefore, even if partisan spending can affect the voter's belief about the governing

party's quality, he does not value this information: in voter-optimal equilibria, only public goods are produced. In this sense, tenure protections are an imperfect remedy to voters' limited ability to observe intra-government relationships and evaluate government production effectively through elections.

8   Conclusion

One of the key messages of this paper is straightforward: insulating government workers from politicians is an important precondition for expansions in government activity. This comes with a significant caveat: even if politicians lose their ability to hire and fire bureaucrats, their position as employers leaves them with considerable power over working conditions in the bureaucracy. Tenure rules come at a cost to voters, because protecting bureaucrats' careers is not equivalent to protecting the bureaucracy from partisan influence. My paper is a first step in exploring the interactions of civil service rules with personnel policies that remain in the hands of politicians. For example, I have captured bureaucratic compensation in reduced form: all the ways in which governing parties can affect the attractiveness of government employment were captured by a single wage bill. This excludes distinctions between salaries, pensions, working conditions, etc. Relatedly, I have treated the bureaucracy as a homogenous mass, leaving out how governments can cater to specific groups of bureaucrats by allocating funding and responsibilities to different agencies. These issues present interesting avenues for pursuing the line of inquiry initiated here.

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A   Appendix

Proof of Proposition 1. Here, I derive the properties of equilibria that do not depend on whether bureaucrats have tenure or not. In order to derive those equilibrium properties that are listed in the statement of Proposition 1, I also present results on wage strategies for parties and voter-optimal government sizes. Furthermore, these set the stage for the more specific equilibrium results without and with tenure, which are listed in Propositions 2 and 3.

Fix government size T some equilibrium, and define

$$\mathcal{X}^*(T) = \mathbb{E}\Big[\chi^*(T, \omega^*(T), \kappa^*(T, \omega^*(T)), \theta)\Big], \text{ and}$$

$$\mathcal{Y}^*(T) = \mathbb{E}\left[\theta\gamma^*(T, \omega^*(T)^*, \kappa(T, \omega^*(T)), \theta)\right],$$

which are, respectively, the expected aggregate production of public and partisan goods in this equilibrium (where the expectation is taken with respect to the partisan shock θ).

Step 1. To study the reelection decision of the voter, consider the end of some period t with party P in power with signal Z_t. The voter's payoff $U_v^P(T, Z_t)$ from returning party P to power for period $t+1$ depends only on T and Z_t, and the voter's payoff from electing opposition party $-P$ is history-independent and is given by $U_v^{-P}(T)$. We have that

$$U_v^P(T, Z_t) = \delta_v\Big[\mathbb{E}[\phi_t^P|Z_t] + \mathcal{X}^*(T) - \Psi T + \delta_v\mathbb{E}\left[\max\left\{U_v^P(T, Z_{t+1}), U_v^{-P}(T)\right\}\right]\Big],$$

where I use the fact that $\mathbb{E}[\phi_{t+1}^P|Z_t] = 0$. We also have that

$$U_v^{-P}(T) = \delta_v\Big[\mathbb{E}[\Phi_{t+1}^{-P}] + \mathcal{X}^*(T) - \Psi T + \delta_v\mathbb{E}\left[\max\left\{U_v^{-P}(T, Z_{t+1}), U_v^P(T)\right\}\right]\Big]$$

$$= \delta_v\Big[\mathcal{X}^*(T) - \Psi T + \delta_v\mathbb{E}\left[\max\left\{U_v^P(T, Z_{t+1}), U_v^{-P}(T)\right\}\right]\Big],$$

where the second equality follows from $\mathbb{E}[\Phi_{t+1}^{-P}] = 0$ and from the independence of bureaucrats' strategies from party identities. It follows that the voter's reelection strategy is such that $\rho^*(T, Z_t) = 1$ only if $\mathbb{E}[\phi_t^P|Z_t] \geq 0$, which, because

$$\mathbb{E}[\phi_t^P|Z_t] = Z_t - \phi_{t-1}^P - [\mathcal{X}^*(T) + \mathcal{Y}^*(T)],$$

follows if and only if

$$Z_t \geq \phi_{t-1}^P + \mathcal{X}^*(T) + \mathcal{Y}^*(T). \tag{4}$$

Step 2. To study the effort and public spending decisions of junior bureaucrats, consider a period t in which party P is newly elected and commits to wage w. Suppose further that the junior bureaucrat has paid partisan cost $k \in \{0, K\}$ and that the current partisan shock is θ. It follows that the spending decision of the junior bureaucrat must be a solution to

$$\max_{0 \leq X, Y \leq \overline{T}} \delta_b \left[\mathbb{P}[P_{t+1} = P]u(w) + \mathbb{P}[P_{t+1} = -P]\mathbb{I}_B u(\omega^*(T)) \right]$$

$$\text{subject to } X + Y \leq T - w,$$

where $\mathbb{I}_B$ is an indicator denoting whether the bureaucrat expects to be retained by an opposition party in period $t + 1$ (i.e., $\mathbb{I}_B = 1$ if and only if bureaucrats have tenure). Because the signal received by the voter after period t is $Z_t = \Phi_t^P + X + \theta Y$, it follows from (4) that

$$\begin{aligned}
\mathbb{P}[P_{t+1} = P] &= \mathbb{P}[Z_t \geq 0] \\
&= \mathbb{P}\left[\phi_t^P \geq \mathcal{X}^*(T) + \mathcal{Y}^*(T) - [X + \theta Y] \right] \\
&= \frac{1}{2\tilde{\phi}} \left[\tilde{\phi} - \left[\mathcal{X}^*(T) + \mathcal{Y}^*(T) - [X + \theta Y] \right] \right]. \tag{5}
\end{aligned}$$

Notice that for any value of k, the probability that P is reelected is increasing in public goods spending $X < \overline{T}$ and partisan spending $Y < \overline{T}$. It follows that, in any equilibrium, the spending decisions of junior bureaucrats satisfy

$$(\chi^*(T, w, 0, \theta), \gamma^*(T, w, 0, \theta)) = \begin{cases} (\min\{T - w, \overline{T}\}, 0) & \text{if } u(w) > \mathbb{I}_B u(\omega^*(T)), \\ (0, 0) & \text{if } u(w) < \mathbb{I}_B u(\omega^*(T)), \end{cases} \tag{6}$$

and

$$(\chi^*(T, w, K, \theta), \gamma^*(T, w, K, \theta)) = \begin{cases} \min\{T - w, \overline{T}\}(\mathbb{I}_{\theta = \underline{\theta}}, \mathbb{I}_{\theta = \bar{\theta}}) & \text{if } u(w) > \mathbb{I}_B u(\omega^*(T)), \\ (0, 0) & \text{if } u(w) < \mathbb{I}_B u(\omega^*(T)). \end{cases} \tag{7}$$

Step 3. To study bureaucrats' optimal partisan investments, consider a period t in which party P is newly elected and commits to wage w. Given equilibrium spending decisions (χ^*, γ^*) as defined by (6) and (7), define

$$\mathbb{P}^*(T, w, k, \theta) = \mathbb{P}[P_{t+1} = P | k, \theta],$$

which is the reelection probability of party P following the public spending stage of period t conditional on partisan investment decision k of junior bureaucrats and partisan shock realisation θ. Furthermore, let the unconditional reelection probability of party P be

$$\mathbb{P}^*(T, w, k) = q\mathbb{P}^*(T, w, k, \overline{\theta}) + (1 - q)\mathbb{P}^*(T, w, k, \underline{\theta}).$$

The payoff to junior bureaucrats from investing in partisanship is

$$u(w) - K + \delta_b \left[\mathbb{P}^*(T, w, K)u(w) + (1 - \mathbb{P}^*(T, w, K))\mathbb{I}_B u(\omega^*(T))\right],$$

whereas their payoff from not investing in partisanship is

$$u(w) + \delta_b \left[\mathbb{P}^*(T, w, 0)u(w) + (1 - \mathbb{P}^*(T, w, 0))\mathbb{I}_B u(\omega^*(T))\right].$$

It follows that, in any equilibrium, junior bureaucrats' partisan investment strategies satisfy

$$\kappa^*(T, w) = \begin{cases} K & \text{if } K < \delta_b \left[\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0)\right] \left[u(w) - \mathbb{I}_B u(\omega^*(T))\right] \\ 0 & \text{if } K > \delta_b \left[\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0)\right] \left[u(w) - \mathbb{I}_B u(\omega^*(T))\right]. \end{cases} \tag{8}$$

For future reference, note that the gain in reelection probability due to partisan investments, $\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0)$, has a simple expression. To see this, note that for any $k \in \{0, K\}$,

$$\mathbb{P}^*(T, w, k) = \frac{1}{2\tilde{\phi}} \left[\tilde{\phi} - \left[\mathcal{X}^*(T) + \mathcal{Y}^*(T) - \mathbb{E}\left[\chi^*(T, w, k, \theta) + \theta\gamma^*(T, w, k, \theta)\right]\right]\right],$$

so that computations yield

$$\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0) = \frac{1}{2\tilde{\phi}} \left[q[\overline{\theta} - 1]\min\{T - w, \overline{T}\}\right]. \tag{9}$$

Step 4. To study the wage decisions of governing parties, consider a period t in which party P is newly elected. Let $U_P^P(T, w)$ denote the payoff to party P if it commits to wage w. Also, let U_P^{-P} denote the payoff to party P if it loses power to the opposition party. It can be verified that

$$U_P^P(T, w) = \frac{1}{1 - \delta_p \mathbb{P}^*(T, w, \kappa^*(T, w))} \left[1 + \delta_p (1 - \mathbb{P}^*(T, w, \kappa^*(T, w))) U_P^{-P} \right],$$

where κ^* is given by (8). Furthermore, $U_P^P(T, w)$ is strictly increasing in $\mathbb{P}^*(T, w, \kappa^*(T, w))$ because $1 > U_P^{-P}(1 - \delta_p)$ (recall that both parties' benefit from holding office in any period is 1). Therefore, the wage strategy of party P will maximise its probability of being reelected in period t.

Fix any time t and define

$$\underline{w}^K(T) = \min\{0 \le w \le T : \kappa^*(T, w) = K\}, \text{ and}$$
$$\underline{w}^0(T) = \min\{0 \le w \le T : u(w) \ge \mathbb{I}_B u(\omega^*(T))\}. \tag{10}$$

Some remarks follow. First, because $0 \le \omega^*(T) \le T$, $\underline{w}^0(T)$ is well-defined. Second, from (8), we have that $\underline{w}^0(T) < \underline{w}^K(T)$ whenener the latter is well-defined. Third, if only $\underline{w}^0(T)$ is well-defined, then because by (5), (6) and (7) the governing party's winning probability is decreasing in the wage w, it follows that $\underline{w}^0(T)$ is optimal for that party. Fourth, if both $\underline{w}^0(T)$ and $\underline{w}^K(T)$ are well-defined, then the governing party's optimal wage policy can be reduced to comparing the probabilities of winning associated to (i) setting wage $w = \underline{w}^K(T) > 0$ and having junior bureaucrats invest in partisanship and (ii) setting wage $w = \underline{w}^0(T)$ and having junior bureaucrats not invest in partisanship.

Given any equilibrium in which both $\underline{w}^0(T)$ and $\underline{w}^K(T)$ are well-defined, we have that

$$\mathbb{P}^*(T, \underline{w}^K(T), K) = \frac{1}{2\tilde{\phi}} \left[\tilde{\phi} - \left[\mathcal{X}^*(T) + \mathcal{Y}^*(T) - \mathbb{E}\left[\chi^*(T, \underline{w}^K(T), K, \theta) + \theta \gamma^*(T, \underline{w}^K(T), K, \theta) \right] \right] \right],$$

and

$$\mathbb{P}^*(T, \underline{w}^0(T), 0) = \frac{1}{2\tilde{\phi}} \left[\tilde{\phi} - \left[\mathcal{X}^*(T) + \mathcal{Y}^*(T) - \mathbb{E}\left[\chi^*(T, \underline{w}^0(T), 0, \theta) + \theta \gamma^*(T, \underline{w}^0(T), 0, \theta) \right] \right] \right],$$

so that computations yield that

$$\mathbb{P}^*(T, \underline{w}(T), K) - \mathbb{P}^*(T, \underline{w}^0(T), 0) = \frac{1}{2\tilde{\phi}}\left[q[\overline{\theta} - 1]\min\{T - \underline{w}^K(T), \overline{T}\} \right.$$
$$\left. - \left[\min\{T - \underline{w}^0(T), \overline{T}\} - \min\{T - \underline{w}^K(T), \overline{T}\}\right]\right].$$

It follows that, in this case, the parties' wage policies are such that

$$\omega^*(T) = \begin{cases} \underline{w}^K(T) & \text{if } q[\overline{\theta} - 1] > \frac{\min\{T - \underline{w}^0(T), \overline{T}\} - \min\{T - \underline{w}^K(T), \overline{T}\}}{\min\{T - \underline{w}^K(T), \overline{T}\}}, \\ \underline{w}^0(T) & \text{if } q[\overline{\theta} - 1] < \frac{\min\{T - \underline{w}^0(T), \overline{T}\} - \min\{T - \underline{w}^K(T), \overline{T}\}}{\min\{T - \underline{w}^K(T), \overline{T}\}}. \end{cases} \tag{11}$$

Step 5. To characterise the optimal government size, fix an equilibrium and consider a period t in which party P is newly elected and has previous competence ϕ_{t-1}^P (which is 0 in expectation if P was in opposition in $t - 1$). Let $U_v(\phi_{t-1}^P, T)$ be the voter's payoff at t if the government size is T. We have that

$$U_v(\phi_{t-1}^P, T) = \phi_{t-1}^P + \mathcal{X}^*(T) - \Psi T + q\delta_v \mathbb{E}[U_v(\phi_t, T)|\theta = \overline{\theta}]$$
$$+ (1 - q)\delta_v \mathbb{E}[U_v(\phi_t, T)|\theta = \underline{\theta}],$$

where I use the fact that $\mathbb{E}[\phi_t^P|\phi_{t-1}] = 0$. Also, I omit the party superscript on competence ϕ_t in the last two terms because the expectation is also taken with respect to electoral outcomes, so that if party P is not reelected the relevant competence term will belong to party $-P$. Notice that $U_v(\phi_{t-1}^P, T) - \phi_{t-1}^P$ is independent of ϕ_{t-1}^P. In words, although the voter benefits from a higher competence ϕ_{t-1}^P in period t, it does not affect the governing party's performance at t, or the behaviour of future governing parties. Define $V_v(T) = U_v(\phi_{t-1}^P, T) - \phi_{t-1}^P$, so that

$$V_v(T) = \mathbb{E}[\mathcal{X}^*(T)] - \Psi T + q\delta_v \mathbb{E}[V_v(T) + \phi_t|\theta = \overline{\theta}] + (1 - q)\delta_v \mathbb{E}[V_v(T) + \phi_t|\theta = \underline{\theta}]$$
$$= \frac{1}{1 - \delta_v}\left[\mathbb{E}[\mathcal{X}^*(T)] - \Psi T + q\delta_v \mathbb{E}[\phi_t|\theta = \overline{\theta}] + (1 - q)\delta_v \mathbb{E}[\phi_t|\theta = \underline{\theta}]\right],$$

Define

$$\Delta^*(T) = \chi^*(T, \omega^*(T), \kappa^*(T, \omega^*(T)), \overline{\theta}) + \overline{\theta}\gamma^*(T, \omega^*(T), \kappa^*(T, \omega^*(T)), \overline{\theta})$$
$$- [\chi^*(T, \omega^*(T), \kappa^*(T, \omega^*(T)), \underline{\theta}) + \underline{\theta}\gamma^*(T, \omega^*(T), \kappa^*(T, \omega^*(T)), \underline{\theta})]$$
$$\geq 0,$$

which is the difference in signals received by the voter conditional on partisan shock $\bar{\theta}$ or $\underline{\theta}$ being realised. Note that by (4) we have that conditional on $\theta = \bar{\theta}$, the governing party is reelected whenever $\phi_t^P \geq -(1-q)\Delta^*(T)$, while conditional on $\theta_t = \underline{\theta}$, the governing party is reelected whenever $\phi_t \geq q\Delta^*(T)$. Therefore, we have that

$$
\mathbb{E}[\phi_t | \theta_t = \bar{\theta}] = \int_{-\tilde{\phi}}^{-(1-q)\Delta^*(T)} \mathbb{E}[\phi_t^{-P}] \mathrm{d}\frac{\phi_t}{2\tilde{\phi}} + \int_{-(1-q)\Delta^*(T)}^{\tilde{\phi}} \phi_t \mathrm{d}\frac{\phi_t}{2\tilde{\phi}}
$$
$$
= \frac{1}{4\tilde{\phi}}\left[\tilde{\phi}^2 - [(1-q)\Delta^*(T)]^2 \right], \text{ and}
$$
$$
\mathbb{E}[\phi_t | \theta_t = \underline{\theta}] = \int_{-\tilde{\phi}}^{q\Delta^*(T)} \mathbb{E}[\phi_t^{-P}] \mathrm{d}\frac{\phi_t}{2\tilde{\phi}} + \int_{q\Delta^*(T)}^{\tilde{\phi}} \phi_t \mathrm{d}\frac{\phi_t}{2\tilde{\phi}}
$$
$$
= \frac{1}{4\tilde{\phi}}\left[\tilde{\phi}^2 - [q\Delta^*(T)]^2 \right].
$$

It follows that

$$
V_v(T) = \frac{1}{1-\delta_v}\left[\mathcal{X}^*(T) - \Psi T + \frac{\delta_v}{4\tilde{\phi}}\left[\tilde{\phi}^2 - q(1-q)[\Delta^*(T)]^2 \right] \right]. \tag{12}
$$

The first two terms are the voter's expected benefits and costs from public spending and the third term is his payoff from party selection. It follows that given any valence shock ϕ_{t-1}^P for the governing party P at time t, the optimal government size must be such that

$$
T^* \in \arg\max_{T \geq 0} V_v(T).
$$

Notice that if there exists tax $\hat{T}$ such that $\chi^*(\hat{T}, \omega^*(\hat{T}), \kappa^*(\hat{T}, \omega^*(\hat{T})), \underline{\theta}) = \overline{T}$, then for all $T > \hat{T}$ we have that $\mathcal{X}^*(\hat{T}) = \mathcal{X}^*(T)$ and $\Delta^*(\hat{T}) = \Delta^*(T)$, so that $V_v(\hat{T}) < V_v(T)$. Because no such choice $\hat{T}$ can be an optimal government size, in what follows I restrict attention to taxes T and wages w such that $T - w \leq \overline{T}$. $\square$

Proof of Proposition 2. When bureaucrats do not have tenure, I substitute $\mathbb{I}_B = 0$ in all relevant expressions from the proof of Proposition 1.

Step 1. Let $\underline{w}^{0,n}(T)$ denote the minimal wage $\underline{w}^0(T)$ that ensure public goods provision from (10), evaluated in an equilibrium without tenure. It is immediate that $\underline{w}^{0,n}(T) = 0$ for all taxes T.

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Step 2. To study optimal civil servant partisanship and wages in an equilibrium without tenure, note that junior bureaucrats' partisan investment strategies (8) can be rewritten as

$$\kappa^*(T, w) = \begin{cases} K & \text{if } K < \delta_b \left[\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0) \right] u(w), \\ 0 & \text{if } K > \delta_b \left[\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0) \right] u(w). \end{cases}$$

Furthermore, let $\underline{w}^{K,n}(T)$ denote the minimal wage $\underline{w}^K(T)$ that ensure the production of partisan goods from (10), evaluated in an equilibrium without tenure. If well-defined, we have that

$$\underline{w}^{K,n}(T) = \min \left\{ w \geq 0 : K = \delta_b \left[\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0) \right] u(w) \right\}. \tag{13}$$

It remains to determine the conditions under which $\underline{w}^{K,n}(T)$ is well-defined. Notice that

$$K > \delta_b \left[\mathbb{P}^*(T, 0, K) - \mathbb{P}^*(T, 0, 0) \right] u(0),$$

which follows because $u(0) = 0$, and that

$$K > \delta_b \left[\mathbb{P}^*(T, T, K) - \mathbb{P}^*(T, T, 0) \right] u(T),$$

which follows because $\chi^*(T, T, k, \theta) = \gamma^*(T, T, k, \theta) = 0$ for all k and θ. Therefore, $\underline{w}^{K,n}(T)$ is well-defined if and only if

$$W(T) \equiv \max_{0 \leq w \leq T} \delta_b \left[\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0) \right] u(w) \geq K. \tag{14}$$

By the envelope theorem, at an optimal solution $0 < w^* < T$ to the above problem we have that

$$\begin{aligned} W'(T) &= \frac{\partial}{\partial T} \left[\delta_b \left[\mathbb{P}^*(T, w^*, K) - \mathbb{P}^*(T, w^*, 0) \right] u(w^*) \right] \\ &= \frac{\delta_b}{2\tilde{\phi}} \left[q[\bar{\theta} - 1] \right] u(w^*) \\ &> 0. \end{aligned}$$

Therefore, if $\underline{w}^{K,n}(T)$ is well-defined for some government size T, $\underline{w}^{K,n}(T')$ must be well-defined for any $T' > T$. Furthermore, because $W(0) = 0$, there are two cases:

(i) $W(\overline{T}) < K$, so that $\underline{w}^{K,n}(T)$ is never defined; (ii) there exists government size $0 < \tilde{T} \leq \overline{T}$ such that $\underline{w}^{K,n}(T)$ is well-defined if and only if $T \geq \tilde{T}$. Any voter-optimal equilibrium under case (ii) with government size $T = \tilde{T}$, it must be the case that bureaucrats are nonpartisan (even though they are indifferent). Therefore, to unify notation, I will also define $\tilde{T} = \overline{T}$ under case (i), although here given this tax revenue junior bureaucrats strictly prefer to be nonpartisan.

A claim is that $\underline{w}^{K,n}(T)$ is decreasing for $T \geq \tilde{T}$: in the absence of tenure, when the government is larger, the conflict of interest between parties and bureaucrats is reduced. To see this, suppose, towards a contradiction, that $T' > T \geq \tilde{T}$ but that $\underline{w}^{K,n}(T') > \underline{w}^{K,n}(T)$. By (13), we have that

$$K = \frac{1}{2\tilde{\phi}} \left[q[\overline{\theta} - 1][T' - \underline{w}^{K,n}(T')] \right] u(\underline{w}^{K,n}(T'))$$

$$= \frac{1}{2\tilde{\phi}} \left[q[\overline{\theta} - 1][T - \underline{w}^{K,n}(T)] \right] u(\underline{w}^{K,n}(T)).$$

It follows that

$$\frac{1}{2\tilde{\phi}} \left[q[\overline{\theta} - 1][T' - \underline{w}^{K,n}(T)] \right] u(\underline{w}^{K,n}(T)) > K,$$

and, because

$$\frac{1}{2\tilde{\phi}} \left[q[\overline{\theta} - 1]T' \right] u(0) = 0,$$

there must exist $w' < \underline{w}^{K,n}(T)$ such that

$$\frac{1}{2\tilde{\phi}} \left[q[\overline{\theta} - 1][T' - w'] \right] u(w') = K,$$

which contradicts (13).

We can rewrite the parties' wage policies from (11) as

$$\omega^*(T) = \begin{cases} \underline{w}^{K,n}(T) & \text{if } T \geq \tilde{T} \text{ and } q[\overline{\theta} - 1] > \frac{\underline{w}^{K,n}(T)}{T - \underline{w}^{K,n}(T)}, \\ 0 & \text{if } T < \tilde{T} \text{ or if } T \geq \tilde{T} \text{ and } q[\overline{\theta} - 1] < \frac{\underline{w}^{K,n}(T)}{T - \underline{w}^{K,n}(T)}. \end{cases} \tag{15}$$

Note that $\frac{\underline{w}^{K,n}(T)}{T - \underline{w}^{K,n}(T)}$ is decreasing for $T \geq \tilde{T}$ because $\underline{w}^{K,n}(T)$ is decreasing, so that, by Assumption 2, $q[\overline{\theta} - 1] > \frac{\underline{w}^{K,n}(T)}{T - \underline{w}^{K,n}(T)}$ for all $T \geq \tilde{T}$.

Step 3. To study the voter-optimal government size, a first claim is that if $T^* \leq \tilde{T}$, then it must be that $T^* = \tilde{T}$. Referring to the voter's payoff from (12), note that for any $T \leq \tilde{T}$, we have that $\Delta^*(T) = 0$, so that

$$V_v(T) = T[1 - \Psi] + \frac{\delta_v \tilde{\phi}}{4} + \delta_v V_t(\tau^*),$$

which is maximised at $T = \tilde{T}$ because $\Psi < 1$.

A second claim is that the voter-optimal government size cannot be such that $T^* > \tilde{T}$. To see this, note that for any $T > \tilde{T}$ such that $T - \underline{w}^{K,n}(T) \leq \overline{T}$, we have that $\Delta^*(T) = [\overline{\theta} - 1][T - \underline{w}^{K,n}(T)] > 0$. Suppose, towards a contradiction, that $T^* > \tilde{T}$. It follows that

$$V_v(T^*) = \frac{1}{1 - \delta_v} \left[(1 - q)[T^* - \underline{w}^{K,n}(T^*)] + \frac{\delta_v}{4\tilde{\phi}} \left[\tilde{\phi}^2 - q(1 - q)\Delta^*(T^*)^2 \right] - \Psi T^* \right]$$

$$\tag{16}$$

$$< \frac{1}{1 - \delta_v} \left[[1 - q - \Psi]T^* + \frac{\delta_v \tilde{\phi}}{4} \right]$$

$$< \frac{1}{1 - \delta_v} \left[\frac{\delta_v \tilde{\phi}}{4} \right],$$

where the first inequality follows because, given $T^* > \tilde{T}$, we have that both $\underline{w}^{K,n}(T^*) > 0$ and $\Delta^*(T^*) = [\overline{\theta} - 1][T^* - \underline{w}^{K,n}(T^*)] > 0$, and the second inequality follows by Assumption 1. Notice that the expression following the final inequality is the voter's payoff from government size $T = 0$, yielding the desired contradiction. Finally, the previous arguments establish that $T^* = \tilde{T}$. $\qquad\square$

Proof of Proposition 3. When bureaucrats have tenure, I substitute $\mathbb{I}_B = 1$ in all relevant expressions from the proof of Proposition 1.

Step 1. Note that with tenure and given any government size T there is no equilibrium in which junior bureaucrats invest in partisanship. This follows immediately by substituting $w = \omega^*(T)$ in (8). Let $\underline{w}^{0,r}(T)$ denote the minimal wage $\underline{w}^0(T)$ that ensure public goods provision from (10), evaluated in an equilibrium with tenure. It follows that $\underline{w}^{0,r}(T) = \omega^*(T)$. Therefore, this setting has multiple equilibria differentiated by bureaucrats' expected future wages. To circumvent this issue, I will characterise the

equilibrium that is optimal for the voter. I will do this in two steps: first, I will identify the equilibrium path actions of this voter-optimal equilibrium through the solution of a reduced problem, and second, I will complete the description of the full equilibrium profile.

Step 2. I will first assign outcomes to any government size T. For any T, the goal is to describe two wage functions $w^E(T)$ and $\underline{w}^E(T)$. In words, $w^E(T)$ will correspond to the equilibrium wage associated with government size T and $\underline{w}^E(T)$ will correspond to the best (deviation) wage that politician can offer to junior bureaucrats in order to induce them to engage in partisan spending. For any wage w and partisan participation decision $k \in \{0, K\}$, define $\mathbb{P}^E(T, w, k)$ as the analog of $\mathbb{P}^*(T, w, k)$, but with $w^E(T)$ replacing $\omega^*(T)$ in the bureaucrats' spending strategies from (6) and (7). Given any T, define $(w^E(T), \underline{w}^E(T))$ such that

$$\underline{w}^E(T) = \arg\max_{0 \le w \le T} \delta_b \left[\mathbb{P}^E(T, w, K) - \mathbb{P}^E(T, w, 0) \right] [u(w) - u(w^E(T))], \text{ and} \quad (17)$$

$$w^E(T) = \min \Big\{ 0 \le w \le T : \delta_b \left[\mathbb{P}^E(T, \underline{w}^E(T), K) - \mathbb{P}^E(T, \underline{w}^E(T), 0) \right] \quad (18)$$
$$\cdot \left[u(\underline{w}^E(T)) - u(w) \right] \le K \Big\}.$$

It needs to be determined whether $(w^E(T), \underline{w}^E(T))$ are well-defined. Let

$$W^E(T, w^E) = \max_{0 \le w \le T} \delta_b \left[\mathbb{P}^E(T, w, K) - \mathbb{P}^E(T, w, 0) \right] [u(w) - u(w^E)]$$

Recalling (14), first note that $W^E(T, 0) = W(T) \le K$ for all $T \le \tilde{T}$ and that $W^E(T, 0) = W(T) > K$ for all $T > \tilde{T}$. Second, by the envelope theorem, we have that $W^E(T, w^E)$ is strictly decreasing in w^E (because u is strictly increasing) and furthermore $W^E(T, T) = 0$. Therefore, (*i*) if $T \le \tilde{T}$ we have that $W^E(T, w^E) \le K$ for all w^E and $w^E(T) = 0$, and (*ii*) if $T > \tilde{T}$, there exists a unique value $\hat{w}$ such that

$$W^E(T, w^E) \begin{cases} > K & \text{if } w^E < \hat{w}, \\ = K & \text{if } w^E = \hat{w}, \\ < K & \text{if } w^E > \hat{w}, \end{cases}$$

and we have that $w^E(T) = \hat{w}$. Third, from (9), we have that

$$\mathbb{P}^E(T, w, K) - \mathbb{P}^E(T, w, 0) = \frac{1}{2\tilde{\phi}} \left[q[\bar{\theta} - 1][T - w] \right],$$

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so that, given the strict concavity of u, it can be verified that the objective in (17) is strictly concave. Therefore, $\underline{w}^E(T)$ is uniquely defined as the solution to the first-order condition

$$-[u(\underline{w}^E(T)) - u(w^E(T))] + [T - \underline{w}^E(T)]u'(\underline{w}^E(T)) = 0. \tag{19}$$

Now restrict attention to government sizes $T > \tilde{T}$, for which $W^E(T, w^E(T)) = K$. It follows by the envelope theorem that $\frac{d}{dT}W^E(T, w^E(T)) = 0$, which can be rewritten as

$$[u(\underline{w}^E(T)) - u(w^E(T))] - [T - \underline{w}^E(T)]u'(w^E(T))w^{E'}(T) = 0. \tag{20}$$

Combining (20) with (19) yields that

$$\begin{aligned}
w^{E'}(T) &= \frac{u'(\underline{w}^E(T))}{u'(w^E(T))} \\
&= e^{-a(\underline{w}^E(T) - w^E(T))} \\
&< 1,
\end{aligned} \tag{21}$$

where the second equality follows from the fact that $u(x) = 1 - e^{-ax}$ and the inequality follows from the fact that $\underline{w}^E(T) > w^E(T)$. Taking the derivative of (19) with respect to T (and using (21)) yields that

$$\begin{aligned}
\underline{w}^{E'}(T) &= \frac{u'(\underline{w}^E(T))}{u'(\underline{w}^E(T)) - \tfrac{1}{2}[T - \underline{w}^E(T)]u''(\underline{w}^E(T))} \\
&= \frac{1}{1 + \raise1pt{a}/\lower1pt{2}[T - \underline{w}^E(T)]} \\
&= \frac{1}{1 + \tfrac{1}{2}\left[e^{a(\underline{w}^E(T) - w^E(T))} - 1\right]} \\
&< 1,
\end{aligned} \tag{22}$$

where the second equality follows from the fact that $u(x) = 1 - e^{-ax}$, and the third equality follows from using (19) to substitute for $T - \underline{w}^E(T)$. It can be verified by computation that $\underline{w}^{E'}(T) > w^{E'}(T)$. From this, it follows that

$$\begin{aligned}
w^{E''}(T) &= -ae^{-a(\underline{w}^E(T) - w^E(T))}\left[\underline{w}^{E'}(T) - w^{E'}(T)\right] \\
&< 0.
\end{aligned}$$

Recall from the steps leading up to (11) that $\mathbb{P}^E(T, \underline{w}^E(T), K) - \mathbb{P}^E(T, w^E(T), 0) \geq 0$ if and only if

$$q[\bar{\theta} - 1] \geq \frac{\underline{w}^E(T) - w^E(T)}{T - \underline{w}^E(T)}$$

It can be verified by computation that

$$\frac{\mathrm{d}}{\mathrm{d}T} \left[\frac{\underline{w}^E(T) - w^E(T)}{T - \underline{w}^E(T)} \right] < 0$$

if and only if

$$a > \frac{1 - e^{-a(\underline{w}^E(T) - w^E(T))}}{\underline{w}^E(T) - w^E(T))}$$
$$= \frac{u(\underline{w}^E(T) - w^E(T)))}{\underline{w}^E(T) - w^E(T))},$$

which holds because the strict concavity of u implies that

$$a = u'(0)$$
$$> \frac{u(\underline{w}^E(T) - w^E(T)))}{\underline{w}^E(T) - w^E(T))}.$$

Therefore, using the fact that $w^E(\tilde{T}) = 0$, Assumption 2 implies that, for all $T > \tilde{T}$,

$$q[\bar{\theta} - 1] > \frac{\underline{w}^E(\tilde{T}) - w^E(\tilde{T})}{T - \underline{w}^E(\tilde{T})}$$
$$> \frac{\underline{w}^E(T) - w^E(T)}{T - \underline{w}^E(T)}.$$

Step 3. Finally, I consider the voter's payoff from any pair $(\underline{w}^E(T), w^E(T))$. Define government size $\hat{T}$ such that $\hat{T} - w^E(\hat{T}) = \overline{T}$. Suppose that the government size is $0 \leq T \leq \hat{T}$ and that bureaucrats receive wage $w^E(T)$ and spend all remaining tax revenue on public goods. From arguments as those that lead to (12), we have that

$$V_v^E(T) = \frac{1}{1 - \delta_v} \left[T[1 - \Psi] - w^E(T) \right].$$

Let $T^{**} \in \arg\max_{0 \leq \tilde{T} \leq \hat{T}} V_v^E(T)$. Because $w^E(T) = 0$ for all $T \leq \tilde{T}$, it must be that $T^* \geq \tilde{T}$. Because $w^E(T)$ is strictly concave for $T \geq \tilde{T}$, it follows that $V_v^E(T)$ is strictly

convex, so that

$$T^{**} = \begin{cases} \hat{T} & \text{if } \frac{w^E(\hat{T}) - w^E(\tilde{T})}{\hat{T} - \tilde{T}} < 1 - \Psi, \\ \tilde{T} & \text{if } \frac{w^E(\hat{T}) - w^E(\tilde{T})}{\hat{T} - \tilde{T}} > 1 - \Psi, \end{cases} \tag{23}$$

with $T^{**} \in \{\tilde{T}, \hat{T}\}$ otherwise.

Step 4. Now I will show how to use the results derived in the preceding reduced problem to construct the voter-optimal equilibrium under tenure. Fix any $T \geq \tilde{T}$. A first claim is that if there exists an equilibrium with wage $\omega^*(T) = w^E(T)$, then (i) bureaucrats' equilibrium spending and partisan participation strategies are given by (6), (7) and (8), with the additional restriction that $\kappa^*(T, \underline{w}^E(T)) = 0$ (i.e., when offered wage $\underline{w}^E(T)$, junior bureaucrats resolve their indifference in favour of non-participation) (ii) parties' equilibrium wage policies are described by (11) and setting $\omega^*(T) = w^E(T)$ in all periods is optimal for the governing party, and (iii) no other equilibrium with government size T yields higher payoffs to the voter. To see (ii), note that, by the construction of $w^E(T)$, no wage offer w can lead bureaucrats to engage in partisan spending. Furthermore, bureaucrats shirk for any wage $w < w^E(T)$, as it induces them to strictly prefer the opposition party to win, so that the wage $w^E(T) = \underline{w}^0(T)$ (i.e., it is the lowest wage for which junior bureaucrats spend on public goods provision). Finally, note that (iii) follows because all equilibria with tenure have nonpartisan bureaucrats, and, by construction of $w^E(T)$ in (18), it is the lowest wage that guarantees non-participation. A second claim is that $T^* = T^{**}$ is the voter-optimal government size, but given the first claim this follows from Step 3. $\square$

Proof of Proposition 4. This follows from the proof of Proposition 3. First, note that because $\hat{T} - w^E(\hat{T}) = \overline{T}$ and $w^{E\prime}(T) > 0$, we have that $\hat{T}$ is increasing in $\overline{T}$. Second, as noted in text, $\tilde{T}$ is independent of $\overline{T}$. Third, from (23), it only remains to establish that

$$\frac{\mathrm{d}}{\mathrm{d}\hat{T}} \left[\frac{w^E(\hat{T}) - w^E(\tilde{T})}{\hat{T} - \tilde{T}} \right] < 0,$$

which is satisfied because $w^E(T)$ is strictly concave for $T \geq \tilde{T}$. $\square$

Proof of Proposition 5. In keeping with my focus on symmetric and stationary strategies, a tax strategy for party P is $\tau^* \geq 0$ and a tenure strategy for party P is $\sigma^* \in \{0, 1\}$,

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where $\sigma^* = 1$ denotes the granting of tenure. Let $\Sigma^* \in \{0, 1\}$ be the voter-optimal tenure rule: $\Sigma^* = 1$ if and only if $\overline{T} > \check{T}$. I show that policy proposals $(\tau^*, \sigma^*) = (T^*, \Sigma^*)$, along with the strategies identified by Propositions 1-3, are an equilibrium.

Although the two parties are identical ex ante and they adopt symmetric strategies in equilibrium, the realisation of the signal Z_t induces partisan preferences for the voter: in any period t, the incumbent is advantaged if $\mathbb{E}[\phi_t^{P_t}|Z_t] \geq 0$ and the challenger is advantaged otherwise. First, if the advantaged party commits to (T^*, Σ^*), then because (i) these policy proposals are voter-optimal, (ii) parties' strategies are symmetric starting from period $t + 1$ and (iii) this party has a valence advantage, then the advantaged party wins the election with probability 1 irrespective of the disadvantaged party's policy commitments. Second, by Proposition 1 the reelection probability of the advantaged party for all periods starting in $t + 1$ is $^1/_2$ for all policy commitments in period t, so that committing to (T^*, Σ^*) is optimal. Finally, because the disadvantaged party loses with probability 1 for any policy commitments if it expects the advantaged party to commit to (T^*, Σ^*), then setting (T^*, Σ^*) is optimal. $\square$