

Civil Service and the Growth of Government*

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Abstract

I study a dynamic model of elections which links the scale of government activity to the presence of civil service protections. In the model, voters with a demand for public goods forward tax revenue to the government and office-motivated governing parties delegate public spending to career-concerned civil servants. Governments always have power over civil service compensation, but civil service protections limit their ability to hire and fire civil servants. If civil servants are unprotected, civil service turnover matches government turnover and civil servants' interests are aligned with those of the party that hires them. To avoid wasteful partisan spending, voters only consent to minimal taxation. If civil servants are protected, they have no incentive to favour one party over another and governments produce only public goods, so that, in turn, voters consent to high taxes. However, because higher tax revenues increase the corruptibility of civil servants through favourable compensation policies, large-scale government activity is only achieved by inefficiently high wages in the civil service, which increase the frictions in the relationship between politicians and civil servants.

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1 Introduction

In the late 19th and early 20th centuries, many democratic countries saw both (*i*) the adoption of civil service reforms in the form of a-political personnel rules, from merit-

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based hiring to tenure-protected retention, as well as (ii) large expansions in government activity, including public education, old-age pensions, unemployment insurance and other welfare state programs. In this paper, I develop a theoretical model that links these two developments by focusing on how the relationship between civil servants and politicians affects voters' willingness to fund government spending on public goods through taxation. The central insight of the model is simple. Voters have a demand for public goods, but they understand that their supply is determined by the interaction of governing parties, to which voters entrust tax revenues, and civil servants, who are tasked by elected officials with delivering public services. If personnel decisions are left entirely to politicians, they can use their power over civil servants' careers to manipulate the administration of tax revenues so that it favours partisan and electoral goals over the efficient provision of public goods. Therefore, large-scale government expansion is incompatible with an unreformed civil service, as voters have no reason consent to the corresponding growth in taxation.

I study a class of symmetric stationary subgame perfect equilibria in an infinite horizon model in which two parties compete for power through elections in every period. Because the scale and complexity of government activity requires a division of labour to administer public programs effectively, the governing party must delegate the spending of tax revenue to civil servants. Civil servants are competent and nonpartisan (in their preferences, but as I will show not necessarily in their equilibrium behaviour), but they are career-concerned: their expertise ensures that spending tax revenue on public goods efficiently is always feasible but retention rules or compensation packages, which are designed by politicians, can generate incentives to engage in partisan spending which improves the electoral prospects of the governing party.

By determining the power that politicians have over civil servants, civil service protections shape the degree to which governing parties can align the incentives of civil servants to their partisan objectives. When civil servants are unprotected, governing parties determine both their employment status and their wages. In equilibrium, the parties' hold over the civil service is complete: all civil servants are identified with only one party, and opposition parties that reach office always fire all civil servants that served the previous government. Because civil servants' job prospects are tied to partisanship, their actions in office are guided by the interests of the party that hires them.

Moreover, parties' monopoly over their workforce's careers ensures that civil service compensation is minimal. Both these features, of government-specific turnover and low compensation, are well-documented in the historical periods of patronage in advanced democracies (e.g., Libecap and Johnson (2007) and Ting et al. (2013) for the United States, Kingsley (1944) and Orloff and Skocpol (1984) for the United Kingdom, and Juillet and Rasmussen (2008) for Canada), as well in transitioning and developing countries (e.g., Gorodnichenko and Peter (2007), Kopecký et al. (2016) and Van Rijckeghem and Weder (2001)).

If civil servants are protected, then civil service hiring is no longer in the hands of politicians and civil servants are guaranteed a career path that is independent of electoral outcomes. However, as they leave intact governments' responsibility to set civil servants' working conditions and compensation, these reforms alone do not shield permanent civil servants from attempts by governing parties to recruit their partisan participation. In particular, by enacting a wage policy that is sufficiently generous relative to the policy expected of the opposition, a governing party can induce partisan preferences within the civil service that are strong enough to distort their spending of tax revenues. In equilibrium, all such attempts at corruption fail and civil servants produce public goods efficiently given the government's resources. However, defeating partisan attempts at corrupting civil servants through generous compensation generates a lower bound on their equilibrium wages: civil servants are not corruptible only because the wage they expect from the opposition in case the government is defeated is sufficiently high.

To an outside observer, the model's post-reform civil service compensation policies resembles an efficiency wage (Shapiro and Stiglitz (1984)), with rents seemingly delivered to civil servants to promote good behaviour. If only because civil servants are protected from dismissal by rigid tenure rules, this compensation scheme seems illogical. Furthermore, when their careers do not depend on their decisions, civil servants allocate government funds according to their public-spirited preferences, so that no rents are needed to provide them with incentives to produce public goods. These observations miss a critical point, however, which is that inflated civil service salaries are not instituted to control the quality the public goods produced by civil servants, but rather to control the politicisation of the civil service by partisan governments. This expla-

nation for favourable civil service working conditions, which are supported by findings of a public-private wage gap in many countries (e.g. Gregory and Borland (1999)), is distinct from other explanations that rely on theories of bureaucratic rent-seeking (Tullock (1965), Niskanen (1975) and Marconi et al. (2009)), partisan manipulation of government employment for redistribution purposes (Alesina et al. (2000)), or on bargaining between governments and unions representing civil servants (Fernández-de Córdoba et al. (2012)). In fact, the closest analogue is to efficiency-wage theories of compensation for public employees to counter corruption (Becker and Stigler (1974), Besley and McLaren (1993)). A key distinction is that in my model civil servants' compensation constrains the bribes that their employer, as opposed to their clients, can offer them.

When civil servants are protected, voters know that all tax revenues are devoted to public goods and civil service compensation, and never to partisan spending. The equilibria that maximise voters' payoffs can exhibit one of two government sizes. If voters' demand for public goods is low, or if the "efficiency" wages paid to civil servants to protect them from politicians are high, then the optimal government size is small: in fact it is the same minimal size achieved without civil service protections. In this case, there are no benefits to civil service reforms, as the gains from public goods provision by large governments are dissipated in rents, which are delivered to civil servants but are intended to thwart politicians. On the other hand, if voters' demand for public goods is high, then the government's size is maximised and the voters' demand is fully met by a nonpartisan but excessively paid civil service.

Thus, returning to the observations in my first paragraph, civil service reform and the scale of government activities are tightly connected, and their underlying predictor is the electorate's latent demand for public goods. This is in line with historical studies of civil service reforms in advanced democracies, which stress how the old patronage systems could not adequately fulfill the new tasks that governments were being pressured to undertake by their citizens. For example, civil service reform in the United Kingdom started in Victorian times (see Orloff and Skocpol (1984)), when the government had major undertakings at home (e.g., social legislation like the Poor Laws) and abroad (managing an expanding colonial empire). In the United States, the push for civil service reforms was spurred by the increased demands for public services that

accompanied post-Civil War industrialisation and urbanisation (see Libecap and Johnson (2007), who also provide evidence that local civil service reforms were adopted earlier in more urban areas, which were disproportionately affected by inefficiencies in mail delivery and customs offices). In Canada, the government expansion prompted by the First World War gave rise to a watershed Civil Service Act in 1918 (see Juillet and Rasmussen (2008). In the literature on state capacity in development economics, Besley and Persson (2009) highlight the link between war and the formation of state administrations).¹

1.1 Related Literature

My paper contributes to a relatively small theoretical literature on civil service reform. A closely related paper is Ujhelyi (2014), in that his model is also centered on how civil service reforms affect the interactions between politicians and civil servants, and, through this, government outcomes and electoral results. As in my model, civil servant's ability to either help or hinder incumbent politicians plays a key role in his results. His model features a fixed scale of government, and his main focus is to characterise the tradeoff between (i) politicians' accountability to voters, which is helped by civil servants' partisanship even if it means implementing policies they know to be bad for voters, and (ii) civil servants' direct contribution to voter welfare, which is helped by protecting civil servants from politicians, which gives them the power to thwart bad policies. I focus on linking civil service performance with the scale of government activity, and furthermore, in my model, civil service protections always improve electoral selection by eliminating the partisan spending which distorts electoral outcomes.

Ting et al. (2013) study the adoption of civil service reforms in a dynamic model with electoral alternation. Their focus is on the loss of government productivity caused by civil service turnover under patronage systems. Their key results link a government's decision to insulate the civil service from political pressure to expected electoral outcomes: governments that expect to lose care more about the future undistorted spending of protected civil servants and are more likely to implement civil service re-

¹Related evidence is also presented by Coate and Knight (2011), who show that cities in the United States with city managers have higher public spending than cities with an elected mayor. See also Rauch (1995), who provides evidence that early 20th century cities in the United States that adopted civil service reforms devoted more of their revenue to infrastructure investments.

forms. In a related paper, Huber and Ting (2016) study government investments in a nonpartisan civil service in a dynamic model with probabilistic voting. Their focus is on a governing party's tradeoff between (i) increasing the size of the nonpartisan civil service, which increases future government performance, and (ii) increasing patronage appointments, which yields immediate electoral advantages. They show that large professional civil services evolve when parties place prefer public goods relative to private partisan goods.

A related literature in economics, which is much more extensive, studies the voter's delegation of decision-making authority to elected officials or bureaucrats (e.g., Alesina and Tabellini (2007) and Maskin and Tirole (2004)). In political science, this approach is complemented by focusing on the incentives of politicians themselves to delegate discretionary authority to the civil service (Gailmard and Patty (2012) survey this literature exhaustively, and Gailmard and Patty (2007) focus on the relationship between delegation and civil service reform). As Ujhelyi (2014) notes in his review of this literature, the decision by a politician to delegate decision-making to a civil servant can be interpreted as a form of civil service protection. In my model, civil servants always have discretion in the spending of government funds, and the role of civil service protections is to interfere with the contractual arrangements between governments and the civil service. Without protections, civil servants choose to align themselves with politicians, while with protections they choose to act in the voters' interests.

The literature on the importance of state capacity for economic development deals with issues that are closely related to those I focus on here. The concept of state capacity was introduced in informal work by historians and political scientists (e.g., Tilly and Ardant (1975), Migdal (1988) and Evans et al. (1993)). In particular, Levi (1989) stresses the importance of states ensuring the compliance of citizens with the gathering of tax revenue, which often relies on norms of trust and fairness. An interpretation of my results along these lines is that they show how institutional changes like civil service reforms generate trust in politicians among voters as an equilibrium outcome, given that taxpayers forecast (correctly) that the funds they forward to the government will actually be spent on the goods that they value. Furthermore, one of the main points of my model, that a professional civil service is necessary for welfare state-type expansions in government activity, is quite close to the argument by Evans et al. (1993)

that civil service reforms are necessary for a “developmental state”. His argument relies on the fact that only permanent civil servants have the long horizon required to make infrastructure and other investments that are preconditions to economic growth (see also Rauch and Evans (2000)).

There is a growing theoretical literature in economics on state capacity. Besley and Persson (2009, 2010) have developed a class of models in which state capacity, to support both government production through fiscal capacity and private production through legal capacity, is an endogenous choice made by forward-looking governments (see also the discussion in Besley and Persson (2014)). Closer to the topic of my paper, Acemoglu et al. (2011) present a micro-founded model of state capacity in which nondemocratic rulers decide whether to professionalise the civil service or maintain a patronage system. They show that rich elites that face a high risk of democratisation can prefer a corrupt civil service because the resulting governmental inefficiency limits the ability of the poor to redistribute wealth once they accede to power. Acemoglu (2005) studies the taxation and public goods provision decision of nondemocratic states. In his main results, which study Markov perfect equilibria, strong states are extractive and weak states underinvest in public goods. Interestingly, he studies a class of equilibria in history-contingent strategies (which he calls equilibria with “consensually strong states”) in which a politically insecure state trades access to power against public goods provision to its citizens. In these equilibria, the citizens’ ability to revolt against a leader that underinvests in public goods is critical to sustain the leader’s incentives for good behaviour. In my model, the government’s allocation of tax revenues is unobservable to voters so that spending-contingent punishment strategies are not possible. Instead, the implementation of civil service protections allows voters to infer that the government has no option other than to spend tax revenues appropriately.

2 Model

Two long-lived parties, -1 and 1 , compete for control of the government in an infinite number of periods $t = 1, 2, \dots$, with the party in power in each period being selected through an election decided by a single long-lived voter. The government bureaucracy is staffed by civil servants that live for two periods, and there are overlapping generations

of potential civil servants with each cohort containing an infinite number of individuals: for all $t = 0, 1, \dots$, let I_t be an infinite set that denotes the cohort of potential civil servants born in t .² Furthermore, I assume that each civil servant $i_t \in I_t$ is the representative agent of a labour pool containing a continuum of identical individuals, and I assume that this agent's choices coordinate all members of her labour pool. For all t and all (representative) civil servants $i_t \in I_t$, I normalise the mass of their corresponding labour pool to $1/2$.³

This setting is meant to capture the fact that the provision of public services requires a large workforce with different workers at different stages in their careers. On the one hand, whenever civil servants' career prospects are tied to the government's survival, younger civil servants have an incentive to engage in partisan activities that assist the government's reelection. On the other hand, while older civil servants may not have a stake in future elections, they may owe their current position to past partisan activity. *Government revenue.* I let the size of government be exogenous, and my results will characterise the voter-optimal scale of government activities. Specifically, I capture government size by $T \geq 0$, which is the tax revenue that will be allocated to all governments in all periods, irrespective of their partisan makeup.

Having the scale of government activities be determined outside of political competition yields a very tractable model, and the assumption also highlights the distinction between voters' ability to monitor the scale of tax revenues, which is easy, versus the effectiveness of tax expenditures, which is much more difficult. Put differently, elections may be too blunt a tool to adequately control how politicians spend tax revenue, but they should keep politicians from extracting unwanted taxation from voters.

Government spending. In any period t , some party $P_t \in \{-1, 1\}$ is in power at the beginning of the period. Tax revenue is spent by the civil service under the governing party's supervision. The identity of the civil servants, and in particular whether the governing party has a hand in selecting specific civil servants, depends on the existence of civil service protections. In the absence of civil service protections, governing party P_t hires a pair of civil servants $(j_t, s_t) \in I_t \times I_{t-1}$ to direct the provision of public goods,

²Note that period $t = 0$ is not a governing period but that civil servants born in that period can work for the government in the first governing period $t = 1$ when in the second period of their life.

³This normalisation of civil servant labour pool masses will ensure that per-capita and aggregate dollar variables are identical, which will streamline the exposition of my results.

where j_t is the junior civil servant and s_t is the senior civil servant. I assume that hiring junior civil servants entails a commitment by the governing party P_t to retain them as senior civil servants if P_t is reelected in $t + 1$. However, a junior civil servant in office at t has no guarantee of advancement in the absence of civil service protections, in that she may not be in office in $t + 1$ if the opposition party gains office in $t + 1$ and chooses not to retain her. When the civil service is protected by tenure, hiring and retention decisions are no longer at the discretion of politicians. I model this by specifying an exogenous sequence $(j_t, s_t)_{t=1}^{\infty}$ of civil servants. Furthermore, in this case I assume that all junior civil servants are promoted, so that, for all $t \geq 2$, $s_t = j_{t-1}$.

The governing party P_t also determines the wage bill w_t associated to the civil service at t . Furthermore, I assume that a governing party that is newly elected at t commits to devoting the wage bill w_t to the civil service in each period of the party's tenure in office. I also assume that the government cannot differentially remunerate different members of the civil service, so that, given my normalisation of the size of the civil servant labour pools represented by (j_t, s_t) , it follows that the per-capita wage of all civil servants at t is also w_t . Finally, tax revenue net of wages is $T - w_t$.

Government production. The civil servants (j_t, s_t) in office at t are tasked with spending the tax revenue that remains net of civil service compensation. Because senior civil servants have no incentives to distort public spending for partisan ends, I assume for simplicity that only junior civil servants participate in government production.⁴ Junior civil servants can direct government revenue either to the provision of public goods or to the production of partisan goods that favour P_t . Specifically, given tax revenue T and wage w_t , civil servant j_t allocates revenue $X_t \geq 0$ to the provision of public goods and revenue $Y_t \geq 0$ to partisan goods, which must satisfy the government's spending constraint: $X_t + Y_t \leq T - w_t$. I also impose a technological constraint on public spending: I fix $\bar{T} > 0$ and assume that $X_t, Y_t \leq \bar{T}$ (as I detail below, \bar{T} will parametrise the voter's demand for public goods).

I assume that both public and partisan goods are produced through constant returns to scale technologies. First, given public goods spending X_t , the quantity of the public good produced is X_t . Second, the technology that converts partisan spending into

⁴Integrating spending decisions for senior civil servants is simple, and this was done in an earlier draft of this paper. Results in that setting were essentially identical, but at the cost of additional notational complexity.

partisan goods is time-dependent. Let $\theta_t \in \{\bar{\theta}, \underline{\theta}\}$ be the productivity of partisan spending in period t , where $\underline{\theta} < 1 < \bar{\theta}$ and $\mathbb{P}(\theta_t = \bar{\theta}) = q$ for all periods t . Therefore, given partisan spending Y_t , the quantity of partisan goods produced is $\theta_t Y_t$. Note for now that if $\theta_t = \bar{\theta}$, the production of partisan goods is more efficient than that of public goods, while the opposite is true if $\theta_t = \underline{\theta}$.

Voter's payoffs. At the end of each period t there is an election decided by the voter. Given public spending (X_t, Y_t, w_t) financed by tax revenue T and delivered by governing party P_t , the voter's payoff is

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

where $0 < \Psi < 1$ is the cost of raising tax revenue and $\Phi_t^{P_t}$ is the valence of party P_t . For simplicity, I assume that $\Phi_t^{P_t} = \phi_t^{P_t} + \phi_{t-1}^{P_t}$, where $\phi_t^{P_t}$ and $\phi_{t-1}^{P_t}$ are independent and distributed uniformly on $[-\tilde{\phi}, \tilde{\phi}]$, with $\tilde{\phi} > 0$. As is standard in probabilistic voting models, the valence shock $\phi_t^{P_t}$ at t generates variability in electoral outcomes. Furthermore, the fact that the payoff effect of valence $\phi_{t-1}^{P_t}$ persists into period t gives the voter incentives to select high-valence politicians through his electoral decision at $t - 1$. In this model, I abstract from all actions taken by governments that do not involve public goods provision, so that parties' valence shocks can capture, in reduced form, the voter's evaluation of parties on these other dimensions.

Note that the voter does not derive any utility from partisan spending, although, as I describe next, the production of partisan goods will influence his electoral decisions. Note also that the optimal level of public goods provision for the voter is time-independent, and in particular it is independent of political variables Y_t and $\Phi_t^{P_t}$. Specifically, because the voter's payoff to public goods is linear and $\Psi < 1$, \bar{T} is the optimal level of public goods for the voter. In this model, the voter has an unambiguous demand for public goods, which is parametrized by \bar{T} , and he would be willing to forward as much tax revenue as required to meet this demand to any government he could trust to spend this revenue appropriately. Finally, the voter discounts future payoffs with factor $0 \leq \delta_v < 1$.

Voter's information and elections. To break the link between periods and simplify the model, I assume that $\phi_{t-1}^{P_t}$ is publicly observed at the beginning of period t if $P_t = P_{t-1}$, and to avoid signaling incentives for politicians, I assume that no player observes $\phi_t^{P_t}$

until period $t + 1$ (this approach follows Rogoff (1990)).

What limits the voter's willingness to finance government spending is the possibility that the governing party may induce civil servants to engage in partisan spending. The voter can always fail to reelect poorly behaved governments and he has no demand for partisan spending. Therefore, if elections are effective, he should only fear the misallocation of tax revenue if he cannot fully distinguish it from public goods spending. My key assumption about the voter is that he is sophisticated but poorly informed: the voter anticipates the equilibrium behaviour of parties and the civil service and makes electoral decisions accordingly, but he only observes a noisy proxy of their actual interactions. Specifically, I assume that the voter knows the amount of tax that he forwards to the government but nothing else: he cannot observe civil service compensation or government spending, he cannot distinguish between public goods spending and partisan spending, he does not observe the productivity θ_t of partisan spending, and he does not observe current valence $\phi_t^{P_t}$.

Given public spending (X_t, Y_t, w_t) financed by tax revenue T and delivered by governing party P_t with valence $\Phi_t^{P_t}$, the voter receives a signal

$$Z_t = U_t + \theta_t Y_t.$$

Notice that because $\underline{\theta} < 1 < \bar{\theta}$, a government that wants to maximise the signal received by the voter would support public goods spending if $\theta_t = \underline{\theta}$ and engage in partisan spending if $\theta_t = \bar{\theta}$. Therefore, while the voter only values public goods provision, he can be influenced by partisan spending: in particular, partisan spending can confound the voter's inferences about the governing party's valence. To recap, when making his electoral decision, the voter observes Z_t and $\phi_{t-1}^{P_t}$ but nothing else. I first complete the description of the model, and then I provide various interpretations of partisan goods. *Payoffs and information of parties.* Parties are purely office-motivated, and I normalise their payoffs so that they obtain a stage utility of 1 if in office and 0 if in opposition. Parties discount future payoffs with factor $0 \leq \delta_p < 1$. Party P_t makes its hiring and wage decisions before learning θ_t and without knowing $\phi_t^{P_t}$. Party P_t does not observe how civil servants spend tax revenue (i.e., X_t and Y_t are private).

Payoffs and information of civil servants. Civil servants value wages derived from employment and bear costs from tampering with public funds for partisan purposes.

Specifically, before learning partisan productivity θ_t , each junior civil servants can invest in the ability to engage in partisan spending at cost $K > 0$, and this investment decision is private. The payoff at t to a junior civil servant is $u(w_t) - K$ if she invests in partisan activity and $u(w_t)$ if she does not, where $u(0) = 0$, $u' > 0$ and $u'' < 0$. Senior civil servants receive payoff $u(w_t)$. Furthermore, to simplify some of my results I assume that u has constant absolute aversion to risk, i.e., that $u(w_t) = 1 - e^{-aw_t}$, where $a > 0$ is the coefficient of absolute risk-aversion.⁵ After making her partisan investment and before making her spending decisions, a junior civil servant observes θ_t . If she has invested in partisan activity, then she can direct public funds to help the incumbent (i.e., $Y_t \geq 0$), but if she has not invested in partisan activity then any tax revenue that she allocates must go into the provision of public goods. Finally, civil servants discount future payoffs with factor $0 \leq \delta_c \leq 1$.

Discussion of civil servants' compensation. My key assumption is that a government's control over wages does not depend on the existence of civil service protections regarding tenure and job security (although in equilibrium the two systems will have different compensation schemes). Legislated civil service protections also typically include rigid job classification systems and wage scales that determine the income of individual civil servants. However, office-holders retain significant control over base salaries, benefits and the quantity and types of jobs available in the public service, which together with salaries compose the compensation of the civil service as a whole. In OECD countries this global civil service compensation is typically determined through collective bargaining between the government and civil service unions, and even in the exceptional case of the United States, in which collective bargaining is not universal, unions retain some power to negotiate working conditions on behalf of civil servants (see, e.g., Traxler (1994)). Therefore, while strict rules prevent governments from targeting the career outcomes of any one civil servant, they have many tools with which they can affect the compensation of all civil servants simultaneously.

Discussion of civil servants' motivation and abilities. My key assumption is that civil servants have a cost advantage in the provision of public over partisan goods. My model can then be interpreted as capturing the state of civil service systems after the

⁵Both in the text and in the Appendix, I will make it clear when my results depends on this assumption.

initial round of reforms that imposed basic qualification and political independence standards for civil servants. These were meant to ensure that civil servants had the skills necessary to perform their tasks and that they were free of explicit obligations towards governing parties. For example, the 1883 Pendleton Act in the United States imposed entrance exams and banned the practice of “assessments”, through which civil servants were obligated to deliver a fraction of their salaries to the party that appointed them.⁶ In other words, these initial reforms can be seen as increasing both (i) the productivity of civil servants’ public goods provision and (ii) the frictions in their relationships with politicians. One final note is that by assuming that civil servants bear no effort costs to public goods provision, I abstract from the incentive costs of tenure systems, a recurring theme in criticisms of government bureaucracies. On the one hand, my results can be interpreted as providing an upper bound on the value of civil service protections.⁷ On the other hand, focusing on civil servants that are public-spirited (when their careers are not on the line) strengthens one of my main results: inefficiencies in public goods provision persist even if civil servants are protected from politically motivated dismissals.

Discussion of partisan spending. The signal-jamming property of partisan spending can accommodate different interpretations of the nature of partisan goods. A literal interpretation of my model is that partisan goods are pure waste from the voter’s point of view, so that partisan spending can represent civil servants using their proximity to voters to deceptively promote the achievements of the governing party. But partisan goods can also be interpreted as resulting from wasteful public spending that provides benefits to *some*, but not to *all* voters. As a stylised example, suppose that the electorate is divided into multiple constituencies, and that in each period some constituencies have a need for a genuine public service (e.g., some cost-benefit approved infrastructure project), while all constituencies always have available some wasteful public project (e.g., some unnecessary infrastructure project which nevertheless brings economic activity to the constituency). Suppose that voters in all constituencies cannot distinguish valuable from wasteful projects, and that part of their electoral decisions involve making infer-

⁶Competitive examinations were also a central recommendation the 1854 Northcote-Trevelyan Report in the U.K., which spurred civil service reform there.

⁷The effectiveness of high-powered incentives in public organisations is open to debate, as such contracts can interact with the recruitment and productivity of public-spirited civil servants, as studied in, e.g., Besley and Ghatak (2005) and Francois (2000).

ences about the government's competence by observing spending that benefits their constituency. In any given election, the constituencies that are electorally pivotal need not correspond to those constituencies that have a genuine need for public spending, and the incumbent government will always prefer to spend in the latter constituencies. If constituencies' tax levies are lower than the expected value of a genuine project and higher than the expected value of a wasteful project, then the representative constituency (i.e., an ex ante uninformed constituency) will agree to fund governmental provision of public services if and only if there are no partisan distortions of spending. In this sense, my model with a single voter and purely wasteful partisan spending can be interpreted as the reduced form of a model with many voters and privately beneficial partisan spending. Civil servants have considerable discretion in the day-to-day management of government programs, and voters rarely have enough information to conclusively decipher whether any given decision is required for the competent administration of the program or instead constitutes political favouritism.

2.1 Strategies and Equilibrium

I focus on subgame perfect equilibria of the game that have strong stationarity and symmetry properties. To simplify the exposition, I only define strategies that satisfy my refinement.

Definition 1. Given government size T , a *stationary and symmetric strategy profile* consists of the following.

1. A *wage strategy* for party P is $\omega^*(T) \in [0, T]$.
2. A *civil servant hiring strategy* for party P is $(\sigma_P^*(T, t), \sigma_P^{s*}(T, t)) \in I_t \times I_{t-1}$.
3. A *partisan participation strategy* for junior civil servants is $\kappa^*(T, w) \in \{0, K\}$.
4. *Spending strategies* of junior civil servants are $\chi^*(T, w, k, \theta_t) \in [0, \min\{T - w, \bar{T}\}]$ and $\gamma^*(T, w, k, \theta_t) \in [0, \min\{T - w, \bar{T}\}]$, which satisfy (i) $\chi^*(T, w, k, \theta_t) + \gamma^*(T, w, k, \theta_t) \leq T - w$ and (ii) $\gamma^*(T, w, k, \theta_t) \neq 0$ only if $k = K$.
5. Finally, a *reelection strategy* for the voter is $\rho^*(T, Z) \in \{0, 1\}$.

Henceforth, an *equilibrium* is a subgame perfect equilibrium in stationary and symmetric strategies.

The only decisions for which imposing time-independence and party-symmetry is not appropriate are parties' civil servant hiring strategies. First, because of the non-stationary nature of the overlapping generations of potential civil servants, civil service hiring strategies must depend on calendar time, and second, because of parties' incentives for using hiring rules to induce partisanship in civil servants (in the absence of civil service protections), civil service hiring strategies must depend on party identity. Also, note that governing parties' past commitments to wages and retention decisions impose constraints on feasible hiring and wage decisions in any given period. Instead of detailing these constraints explicitly, which would involve cumbersome notation, I interpret the strategies above as applying only for parties that are free of previous commitments, for which the typical case is an opposition party that has just be voted into office.

My goal is to characterise optimal government size and relate it to civil service protections. A technical issue is that a fixed government size T may admit multiple equilibria. In such cases, 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, an optimal government size T^* is such that no other government size $T \neq T^*$ admits an equilibrium that yields higher ex ante payoffs to the voter.

3 Preliminaries: Public Spending and Elections

I start by discussing those properties of equilibria that are independent of whether civil servants are protected or not, which cover principally their spending decisions.⁸

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

1. *If either (i) $\theta = \underline{\theta}$ or if (ii) $\theta = \bar{\theta}$ and junior civil servants do not engage in partisan activities ($\kappa^*(T, \omega^*(T)) = 0$), then junior civil servants devote all of*

⁸To 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.

their budgets to public goods spending ($\chi^*(T), \omega^*(T), k, \underline{\theta}) = \chi^*(T, \omega^*(T)), 0, \bar{\theta}) = \min\{T - \omega^*(T), \bar{T}\}$ for all k).

2. If $\theta = \bar{\theta}$ and junior civil servants engage in partisan activities ($\kappa^*(T, \omega^*(T)) = K$), then junior civil servants devote all of their budgets to partisan spending ($\gamma^*(T, \omega^*(T), K, \bar{\theta}) = \min\{T - \omega^*(T), \bar{T}\}$).

3. Governments are reelected with probability $1/2$.

Conditional on their partisan participation decision, junior civil servants must spend tax revenue so as to maximise the governing party's probability of winning. First, if civil servants have not invested in partisan activities, they must devote all government revenue to public goods. Because civil servants can always choose not to spend any revenue, this implies that in all equilibria civil servants must always weakly prefer to have the governing party reelected. In turn, this constraint that civil servants cannot prefer to see the opposition come to power sets a lower bound on the wages set by governments. My results below will show that the stringency of this bound depends on the strength of civil service protections. On the one hand, a protected civil servant whose career prospects are insulated from the party in power can have strong preferences for the opposition party if the governing party sets low wages. On the other hand, if an unprotected civil servant's advancement is tied to the electoral fortunes of the governing party, then this party can guarantee her performance even through low compensation. Second, if junior civil servants have invested in partisan activities, then because these are costly these civil servants must strictly prefer to have the governing party reelected, so that they devote all government revenue to partisan goods.

In any equilibrium, the voter returns the incumbent party to power at the end of some period if the signal he receives exceeds the signal he expects given the strategies of parties and civil servants. If the voter expects no partisan spending in equilibrium, then the government exceeds performance expectations if and only if it is of above-average quality ($\phi_t^P \geq 0$). Therefore, in the absence of partisan spending, elections select governments efficiently. If the voter expects partisan spending in equilibrium, then because the voter does not observe partisan spending productivity it follows that the quality threshold that governing parties need to meet to secure reelection is lower when $\theta = \bar{\theta}$ than when $\theta = \underline{\theta}$. Therefore, when the civil service is partisan electoral selection

is distorted: when partisan spending is effective some lower-valence governments win elections by defeating higher-valence opposition parties, and when partisan spending is ineffective some higher-valence governments are replaced by lower-valence opposition parties. Finally, while partisan spending allows governing parties to increase their probability of reelection ex post, it has no effect ex ante: prior to the realisation of θ , a governing party is reelected with probability $1/2$.

4 Benchmark: Direct Spending by Politicians

Consider the benchmark in which parties need not delegate public spending to civil servants, so that each party directly spends government tax revenue whenever they are in power. One interpretation of this benchmark is that it captures government production prior to merit-based hiring rules that imposed competence and qualification requirements on civil servants. In such systems, civil servants need not have any particular affinity for public goods provision or any distaste for partisan spending, and are typically hired for partisan reasons alone: in my model, this would correspond to setting $K = 0$ in the absence of civil service protections.

I first introduce an assumption on the model's parameters that is maintained throughout the paper. Specifically, I assume that political manipulation of public spending is sufficiently costly for the voter that he would not consent to any taxation if certain that tax revenues would be put to partisan use when $\theta = \bar{\theta}$. Note that if the voter finances a government of size T and these funds are allocated to public goods when $\theta = \underline{\theta}$ and to partisan spending when $\theta = \bar{\theta}$, then his payoff is $(1 - q)T - \Psi T$.

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

Given Assumption 1, the following result can be obtained as a Corollary of Proposition 3, which characterises equilibria without civil service protections.

Proposition 2. *Without a civil service, the voter-optimal government size is $T^* = 0$.*

As described in Section 3, given any government size T , spending on partisan goods when $\theta = \bar{\theta}$ maximises the governing party's probability of reelection. Therefore, governing parties distort spending for political ends in all equilibria without civil servants

and, anticipating this manipulation, the voter prefers not to fund any government expenditures.

5 No Civil Service Protections

In the absence of a civil service, no public goods provision is possible. Can the introduction of a competent but career-concerned civil service improve matters for the voter, even if civil servants' jobs are not protected from politicians by a tenure system? The following result shows that under these conditions the voter's demand for public goods can be partially met, but that politicians' power over civil servants' career prospects imposes substantial constraints on the scale of public goods provision.

Proposition 3. *Suppose that there are no civil service protections.*

1. *There exists $0 < \tilde{T} < \bar{T}$ such that, for any government size $T \leq \tilde{T}$ and given any equilibrium, junior civil servants receive no rents ($\omega^*(T) = 0$) and do not engage in partisan activities ($\kappa^*(T, \omega^*(T)) = 0$), so that all government revenue is devoted to public goods.*
2. *For any government size $T > \tilde{T}$ and given any equilibrium,*
 - (a) *junior civil servants receive rents ($\omega^*(T) > 0$) and engage in partisan activities ($\kappa^*(T, \omega^*(T)) = K$), and therefore government revenue is devoted to public goods only when $\theta = \underline{\theta}$,*
 - (b) *opposition parties that come to power never promote the junior civil servants from the defeated government ($\sigma_P^{**}(T, t) \neq \sigma_{-P}^*(T, t - 1)$ for all t), and*
 - (c) *civil service compensation is decreasing in government size ($\omega^*(T)$ is decreasing in T).*
3. *The voter-optimal government size is $T^* = \tilde{T}$*

This result relies on Assumption 2, which is best presented and discussed below: this assumption guarantees that governing parties have sufficient electoral gains from

partisan spending to provide civil servants with the incentives to produce partisan goods (if possible, which is not the case for governments with size $T \leq \tilde{T}$).

Unprotected civil servants can be given the incentives not to become partisan only if the scale of government activities is kept small enough. When governments have little tax revenue at their disposal ($T \leq \tilde{T}$), they cannot muster the resources to corrupt the civil service. However, once government size reaches a critical size ($T > \tilde{T}$), civil servants can be, and are, elicited to help governing parties get reelected. Governing parties use two levers to align the interests of the civil service to their own. First, with enough revenue they can commit to wages that incentivise partisan investments. Second, they complement these incentives by exploiting their discretion in hiring decisions. If an equilibrium has civil servants engaging in partisan activities, then a governing party never hires a junior civil servant at t that is slated to be hired as a senior civil servant if the opposition party gains office at $t + 1$, as this drives up the incentive costs of partisanship. The wage offered to junior civil servants must still be high enough to overcome their cost K to partisanship, but they receive no compensation at all if the governing party loses power.⁹ These equilibria reproduce a well-known feature of historical patronage systems, in that individual civil servants are perfectly identified with a specific party: a governing party always promotes its junior civil servants to its senior positions if reelected (by assumption), and an opposition party that gains access to power never retains the defeated government's civil servants.

If the government size is $T > \tilde{T}$, then all equilibria have $\omega^*(T) > 0$ and $\kappa^*(T, \omega^*(T)) = K$, with $T - \omega^*(T)$ of the tax revenue being diverted into partisan activities by junior civil servants if $\theta = \bar{\theta}$. For all such equilibria, the voter is worse off than in the benchmark without a civil service. Civil servants end up spending tax exactly as a party would on its own, but they extract compensation for their partisan investments that is financed by foregone public goods provision. An important remark is that the government's ability to corrupt the civil service is increasing in government size: increased revenue has a direct effect, by increasing the resources that can be devoted to civil service wages; and it also has an indirect effect, by increasing the impact of partisan spending on electoral outcomes. Therefore, as government size increases, parties can

⁹Even if $T \leq \tilde{T}$ and equilibria feature nonpartisan civil servants, politicians still benefit from their ability to control hiring because the competition between potential civil servants drives down the equilibrium wage (to 0 in equilibrium, given that civil servants produce public goods at no cost).

ensure that civil servants invest in partisan activities in exchange for lower wages.

If the government size is $T \leq \tilde{T}$, then all equilibria have $\omega^*(T) = 0$ and $\kappa^*(T, \omega^*(T)) = 0$, with all tax revenues being spent on public goods provision. In all such equilibria, the voter is better off than in the benchmark without a civil service: the contractual frictions between the parties and civil servants is severe enough that no partisan waste of public funds occurs. However, this only occurs if government revenue is low and public goods are correspondingly underprovided. Therefore, without civil service protections the voter-optimal government size is the largest size \tilde{T} for which tax revenues are insufficient to enlist the partisan participation of civil servants. However, the threat of partisanship is the critical constraint that caps the scale of government activities below what the voter would prefer.

To describe the trade-offs that underly Proposition 3 in more detail, fix government size T along with an equilibrium and fix any period, any wage w set by the governing party and any partisan participation decision k by the junior civil servant. Let $\mathbb{P}^*(T, w, k)$ be the expected reelection probability of the governing party, which is computed using equilibrium strategies and where the expectation is with respect to the partisan shock θ and the valence shock ϕ_t . Wage w provides incentives for junior civil servants to engage in partisan activities if

$$\delta_c [\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0)] u(w) \geq K, \quad (1)$$

and, among those wages that lead to partisan junior civil servants, the lowest such wage $\underline{w}^{K,n}(T)$ is optimal for the governing party and is such that

$$\underline{w}^{K,n}(T) = \min \{0 \leq w \leq T : K = \delta_c [\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0)] u(w)\}.$$

The wage $\underline{w}^{K,n}(T)$ must balance two concerns. On the one hand, this wage cannot be too low because a junior civil servant is partisan if future compensation is attractive enough (i.e., (1) fails if $w \approx 0$ because $u(0) = 0$). On the other hand, this wage cannot be too high because if government resources are tied up in civil service compensation there is too little revenue left over for civil servants to successfully tip electoral outcomes through partisan spending (i.e., (1) fails if $w \approx T$ because $\mathbb{P}^*(T, T, K) - \mathbb{P}^*(T, T, 0) = 0$). In other words, to bind civil servants to them, governing parties need to divert public resources towards two competing but complementary ends: civil service payouts and

partisan spending. Furthermore, government size determines whether these two ends can be met simultaneously or not. In particular, the wage $\underline{w}^{K,n}(T)$ is well-defined if and only if $T \geq \tilde{T}$, and furthermore in this range $\underline{w}^{K,n}(T)$ is decreasing in T , which follows from the complementarity of personal compensation and partisan spending in civil servants' incentives for partisan participation.

Given government size $T \geq \tilde{T}$, do governing parties have an incentive to set wage $\underline{w}^{K,n}(T)$ in order to recruit civil servants' partisan help? In any equilibrium, the governing party chooses among two options: (i) divide tax revenue T between wage bill $\underline{w}^{K,n}(T)$ and public spending $T - \underline{w}^{K,n}(T)$, which is partisan if $\theta = \bar{\theta}$, and (iii) set wage $w = 0$ and devote the entire tax revenue T to public goods spending. Option (i) is optimal for the governing party if

$$q[\bar{\theta} - 1] [T - \underline{w}^{K,n}(T)] \geq \underline{w}^{K,n}(T).$$

The lefthand side of this inequality is a measure of the electoral benefit of a partisan civil service, which contains both the net productivity of partisan spending and its amount. The righthand side is a measure of the opportunity cost of a partisan civil service, which consists of the public goods production foregone through the incentives for partisanship provided to civil servants. The following assumption is maintained in the rest of the paper.

Assumption 2. $q[\bar{\theta} - 1] > \frac{\underline{w}^{K,n}(\tilde{T})}{\tilde{T} - \underline{w}^{K,n}(\tilde{T})}$ and $\tilde{T} < \bar{T}$.

Assumption 2 states that the benefit of partisan spending always exceed its cost so that, if civil servants can be induced to become partisan, then parties always want to do so: that is, $\omega^*(T) = \underline{w}^{K,n}(T)$ for all $T > \tilde{T}$.¹⁰ Because $\underline{w}^{K,n}(T)$ is decreasing in $T \geq \tilde{T}$, it follows that setting wage $\underline{w}^{K,n}(T)$ is optimal for all $T \geq \tilde{T}$.

Finally, to see that the voter-optimal government size is $T^* = \tilde{T}$, note that the fact that $\Psi < 1$ ensures that the voter prefers setting \tilde{T} to setting any $T < \tilde{T}$, and Assumption 1 ensures that the voter prefers setting \tilde{T} to setting any $T > \tilde{T}$.

¹⁰Furthermore, because the first part of Assumption 2 imposes that $\underline{w}^{K,n}(\tilde{T})$ is well-defined, we must have that $\tilde{T} \leq \bar{T}$. I make the (minimal) further assumption that the voter's demand for public goods \bar{T} is large enough that this inequality is strict.

6 Civil Service Protections

My results in the last section establish that the voter can leverage the frictions in the relationship between governing parties and unprotected civil servants to produce some public goods, but that the corruptibility of civil servants limits the scale of government activities. Can the introduction of civil service protections, by insulating civil servants' careers from politicians, resolve these issues and lead to efficient public goods production? The main result of this section shows that while civil service protections can lead the government to produce the public goods that the voter demands, they do not ensure that this production is efficient. Driving this result is the observation that while civil service tenure removes a critical instrument of partisan influence, governing parties can still attempt to recruit the help of civil servants through favourable agreements on their compensation. In equilibrium, this threat is warded off by inefficiently high wages in the civil service.

Before characterising equilibria with civil service protections, let \hat{T} be the smallest government size T for which there exists an equilibrium in which public goods are provided at the efficient level \bar{T} . If \hat{T} is well-defined (recall that without civil service protections, no such \hat{T} exists because of there is partisan spending for all $T > \tilde{T}$), it will be such that $\hat{T} > \bar{T}$ because the compensation of civil servants must also be financed from \hat{T} .

Proposition 4. *Suppose that civil servants are protected.*

1. *For any government size $T \leq \tilde{T}$ and given any voter-optimal equilibrium, outcomes are identical to those without civil service protections.*
2. *For any government size $T > \tilde{T}$ and given any voter-optimal equilibrium,*
 - (a) *junior civil servants receive rents ($\omega^*(T) > 0$) but do not engage in partisan activities ($\kappa^*(T, \omega^*(T)) = 0$), so that all government revenue net of wages is devoted to public goods, and*
 - (b) *civil service compensation is increasing in government size ($\omega^*(T)$ is increasing in T).*
3. *The voter-optimal government size is either $T^* = \tilde{T}$ or $T^* = \hat{T}$.*

Nonpartisan spending decisions by civil servants is a necessary condition for equilibria with civil service protections: if the government is small ($T \leq \tilde{T}$), then its resources are insufficient to corrupt the civil service while if the government is large ($T > \tilde{T}$), then even if civil servants are potentially corruptible they expect the same treatment from all parties, so that they cannot have strict preferences for the governing party. However, in the latter case parties' ability to privately contract over compensation imposes constraints on the equilibrium wage: this wage must be high enough to thwart any attempt by governing parties to align civil servants to their interests, so that it delivers rents for the civil service. These rents are not necessary for the civil servant to exert effort in her duties, as providing public goods is costless for her. Neither are these rents part of an efficiency wage, as the tenured civil servant cannot be fired for poor performance. Instead, inflated wages for civil servants are tolerated by voters as an indirect control on governing parties' attempts to politicise the civil service.

As was the case in Section 5, larger governments facilitate civil service partisanship by reducing the agency costs faced by governments for recruiting civil servants. Without civil service protections civil servants are partisan in equilibrium and governing parties extract the rents from larger government revenues, which leads to decreasing civil service compensation for $T > \tilde{T}$. With civil service protections civil servants are not partisan in equilibrium, but larger government revenues still generate gains from partisanship. To ward off the threat of partisan spending, these gains are delivered as rents to civil servants through inflated compensation, so that the wage $\omega^*(T)$ is increasing in T for $T > \tilde{T}$.

Furthermore, I show that wage $\omega^*(T)$ is strictly concave for $T > \tilde{T}$, which implies that the voter's payoff from voter-optimal equilibria is strictly convex.¹¹ Therefore, the voter-optimal government size is either (i) to have partial public goods provision and minimal civil service compensation (i.e., $T^* = \tilde{T}$ and $\omega^*(T^*) = 0$) or (ii) to have full public goods provision and inflated civil service compensation (i.e., $T^* = \hat{T}$ and $\omega^*(T^*) > 0$). The voter cannot be made worse off by civil service protections, and he is made strictly better off if he chooses to have public goods provided at the efficient level. A key determinant of the voter's strict preference for a protected civil service is his demand \bar{T} for public goods.

¹¹Verifying this claim relies on the assumption of CARA utility for civil servants.

Proposition 5. *There exists a demand for public goods $T^R > 0$ such that the voter strictly prefers a protected civil service if and only if $\bar{T} > T^R$.*

Notice that \tilde{T} , the highest tax revenue that leaves the government sufficiently underfunded that governing parties cannot recruit the help of civil servants, is determined solely by civil servants' incentives: it depends only on the preferences of civil servants and on the effect of partisan spending on government reelection. As the voter's demand \bar{T} grows, there is a growing gap between the scale of government activities that is inconsistent with collusion between politicians and civil servants and the voter's ideal scale \bar{T} of government spending. Civil service reform should be expected when this gap is large.¹² While this reform is followed by an expansion of taxation and government spending, as well as favourable compensation and working conditions for civil servants, the voter is strictly better off.

To describe the trade-offs that underly Proposition 4 in more detail, fix government size T along with an equilibrium and fix any period, any wage w set by the governing party and any partisan participation decision k by the junior civil servant. Analogously to (1), wage w provides incentives for junior civil servants to engage in partisan activities if

$$\delta_c [\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0)] [u(w) - u(\omega^*(T))] \geq K. \quad (2)$$

However, because in equilibrium $w = \omega^*(T)$, it follows that (2) is never satisfied so that $\kappa^*(T, \omega^*(T)) = 0$. Because civil servants expect to be retained, and at the equilibrium wage, irrespective of the election's outcome, governing parties have no leverage over them. In other words, guaranteed tenure and promotion is incompatible with partisanship in a career-concerned civil service.

In the absence of civil service protections, the government's power over civil service hiring, which linked political and bureaucratic turnover, also ensured that all simple equilibria shared the same equilibrium path. With civil service protections, the

¹²Interpreting the single voter in my model as a representative voter in a heterogenous electorate, this suggests that demands for civil service reforms should originate from citizens with the highest demand for public goods. As I note in the Introduction, this is consistent with historical evidence: e.g., with the importance of business groups in civil service reform organisations in the late 19th century in the United States, who had the biggest stake in the post-Civil War expansion of government activities (see Libecap and Johnson (2007), as well as Kingsley (1944) for related evidence for the United Kingdom).

equilibrium wage sets civil servants' expectations about future outcomes and multiple equilibria are a robust feature of the model. In particular, given some equilibrium no party would deviate to a wage lower than the equilibrium wage: in this case junior civil servants would strictly prefer for the government to be defeated, so that they would not spend any tax revenue on public or partisan goods. Therefore, I focus on the equilibria that maximise the voter's payoff (over all equilibria), which minimise civil service compensation.

Given any equilibrium, all tax revenues are spent on public goods and civil service compensation. Therefore, identifying voter-optimal equilibria reduces to finding the lowest equilibrium wage $\omega^*(T)$ that leave governing parties with no opportunity to privately recruit the help of civil servants. Given an equilibrium wage $\omega^*(T)$, let

$$\underline{w}^{K,r}(T) = \arg \max_{0 \leq w \leq T} \delta_c [\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0)] [u(w) - u(\omega^*(T))]$$

be the most attractive wage that the governing party can offer to the voter in exchange for partisan participation. As I show in the Appendix, Assumption 2 ensures that governing parties have the incentive to offer this wage to civil servants.¹³ To thwart all attempts at politicising the civil service, the voter-optimal equilibrium wage must be such that

$$\omega^*(T) = \min \left\{ 0 \leq w \leq T : \delta_c [\mathbb{P}^*(T, \underline{w}^{K,r}(T), K) - \mathbb{P}^*(T, \underline{w}^{K,r}(T), 0)] \cdot [u(\underline{w}^{K,r}(T)) - u(w)] \leq K \right\}.$$

From Section 5, we have that $\omega^*(T) = 0$ for all $T \leq \tilde{T}$, and I verify in the Appendix that $\omega^*(T)$ is strictly increasing and concave for $T > \tilde{T}$.

7 Conclusion

The main message of this paper is simple: isolating civil servants from politicians through civil service protections is a necessary condition for expansions in government activity. However, the benefits of civil service reforms are not unambiguous. Even if

¹³This depends on an incentive constraint for governing parties that is similar to the one in Section 5. Additionally, CARA utility for civil servants is used here as it simplifies computations.

governments lose their ability to hire and fire civil servants, their position as employers leaves them with considerable power over the working conditions of the civil service. Tenure rules come at a cost to voters, because protecting the jobs of civil servants is not equivalent to protecting the civil service from partisan influence. Avoiding the misallocation of public funds requires accentuating the frictions between politicians and civil servants. On the one hand, this can be achieved by starving the government of tax revenue, which limits the inducements that politicians can offer to civil servants. On the other hand, large governments generate potential rents that politicians and civil servants can capture through collusion, which voters can thwart only by preemptively inflating civil service compensation.

In this paper, the channels through which civil servant partisanship affects voters' evaluations of government performance are modeled in reduced form. This is appropriate for my purpose, which is to focus on the relationship between government size and civil service protections. However, extending my model to include a more detailed specification of partisan activities by civil servants is a fruitful avenue for future research. In particular, in my model civil service protections are reduced to tenure and nonpartisan hiring. While such rules are the cornerstones of modern civil service systems, these usually feature much more specific prescriptions that regulate civil servants' behaviour, such as bans on political speech or rules that limit politicians' involvement in managerial issues within the civil service. Therefore, a richer modeling of civil servants' activities would lead to a correspondingly richer set of evaluations of and predictions about the effects of the detailed institutional features of civil service protections.

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A Appendix

General properties of equilibria. Here, I derive the properties of equilibria that do not depend on whether civil servants are protected or not. Most of these results deal with the equilibrium effort and spending decisions of civil servants that are listed in Proposition 1, but I also present results on wage strategies for parties and voter-optimal government sizes that set the stage for the more specific equilibrium results before and after civil service reforms, which are listed in Propositions 3 and 4.

Fix government size T some equilibrium, and define

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

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

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

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

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

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

where the second equality follows from $\mathbb{E}[\Phi_{t+1}^{-P}] = 0$ and from the independence of civil servant's 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

$$Z_t \geq \phi_{t-1}^P + \mathcal{X}^*(T) + \mathcal{Y}^*(T). \quad (3)$$

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

$$\begin{aligned} \max_{0 \leq X, Y \leq \bar{T}} \delta_c \left[\mathbb{P}[P_{t+1} = P] u(w) + \mathbb{P}[P_{t+1} = -P] \mathbb{I}_{\sigma_{-P}^{s^*}(T, t+1)=j} u(\omega^*(T)) \right] \\ \text{subject to } X + Y \leq T - w. \end{aligned}$$

Because the signal received by the voter after period t is $Z_t = \Phi_t^P + X + \theta Y$, it follows

from (3) that

$$\begin{aligned}
\mathbb{P}[P_{t+1} = P] &= \mathbb{P}[Z_t \geq 0] \\
&= \mathbb{P}[\phi_t^P \geq \mathcal{X}^*(T) + \mathcal{Y}^*(T) - [X + \theta Y]] \\
&= \frac{1}{2\tilde{\phi}} \left[\tilde{\phi} - [\mathcal{X}^*(T) + \mathcal{Y}^*(T) - [X + \theta Y]] \right].
\end{aligned} \tag{4}$$

Notice that for any value of k , the probability that P is reelected is increasing in public goods spending $x < \bar{T}$ and partisan spending $y < \bar{T}$. It follows that, in any equilibrium, the spending decisions of junior civil servants satisfy

$$(\chi^*(T, w, 0, \theta), \gamma^*(T, w, 0, \theta)) = \begin{cases} (\min\{T - w, \bar{T}\}, 0) & \text{if } u(w) > \mathbb{I}_{\sigma_{-P}^{s*}(T, t+1)=j} u(\omega^*(T)), \\ (0, 0) & \text{if } u(w) < \mathbb{I}_{\sigma_{-P}^{s*}(T, t+1)=j} u(\omega^*(T)), \end{cases} \tag{5}$$

and

$$(\chi^*(T, w, K, \theta), \gamma^*(T, w, K, \theta)) = \begin{cases} (0, \min\{T - w, \bar{T}\}) & \text{if } u(w) > \mathbb{I}_{\sigma_{-P}^{s*}(T, t+1)=j} u(\omega^*(T)), \\ (0, 0) & \text{if } u(w) < \mathbb{I}_{\sigma_{-P}^{s*}(T, t+1)=j} u(\omega^*(T)). \end{cases} \tag{6}$$

Step 3. To study the optimal partisan participation decisions of civil servants, consider a period t in which party P is newly elected. Suppose that the party hires junior civil servant j and that it commits to wage w . Given equilibrium spending decisions (χ^*, γ^*) as defined by (5) and (6), 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 participation decision k of the junior civil servant and partisan shock realisation θ . Furthermore, let the unconditional reelection probability of party P be

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

The payoff to junior civil servant j from engaging in partisan activity is

$$u(w) - K + \delta_c \left[\mathbb{P}^*(T, w, K)u(w) + (1 - \mathbb{P}^*(T, w, K))\mathbb{I}_{\sigma_{-P}^{s*}(T, t+1)=j}u(\omega^*(T)) \right],$$

whereas her payoff from not engaging in partisan activity is

$$u(w) + \delta_c \left[\mathbb{P}^*(T, w, 0)u(w) + (1 - \mathbb{P}^*(T, w, 0))\mathbb{I}_{\sigma_{-P}^{s*}(T, t+1)=j}u(\omega^*(T)) \right].$$

It follows that, in any equilibrium, junior civil servants' partisan participation strategies satisfy

$$\kappa^*(T, w) = \begin{cases} K & \text{if } K < \delta_c [\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0)] \left[u(w) - \mathbb{I}_{\sigma_{-P}^{s*}(T, t+1)=j}u(\omega^*(T)) \right] \\ 0 & \text{if } K > \delta_c [\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0)] \left[u(w) - \mathbb{I}_{\sigma_{-P}^{s*}(T, t+1)=j}u(\omega^*(T)) \right]. \end{cases} \quad (7)$$

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

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

so that computations yield

$$\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0) = \frac{1}{2\tilde{\phi}} [q[\bar{\theta} - 1] \min\{T - w, \bar{T}\}]. \quad (8)$$

Step 4. To study the wage decisions of governing parties (their hiring decisions cannot be treated conveniently without specifying the civil servant protection regime), 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

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

where κ^* is given by (7). 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

$$\begin{aligned}\underline{w}^K(T) &= \min\{0 \leq w \leq T : \kappa^*(T, w) = K\}, \text{ and} \\ \underline{w}^0(T) &= \min\{0 \leq w \leq T : u(w) \geq \mathbb{I}_{\sigma_{-P}^*(T, t+1) = \sigma_P^*(T, t)} u(\omega^*(T))\}.\end{aligned}\quad (9)$$

Some remarks follow. First, because $0 \leq \omega^*(T) \leq T$, $\underline{w}^0(T)$ is well-defined. Second, from (7), we have that $\underline{w}^0(T) < \underline{w}^K(T)$ whenever the latter is well-defined. Third, if only $\underline{w}^0(T)$ is well-defined, then because by (4), (5) and (6) 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 civil servants engage in partisan activities and (ii) setting wage $w = \underline{w}^0(T)$ and having civil servants not engage in partisan activities.

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

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

and

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

so that computations yield that

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

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

$$\omega^*(T) = \begin{cases} \underline{w}^K(T) & \text{if } q[\bar{\theta} - 1] > \frac{\min\{T - \underline{w}^0(T), \bar{T}\} - \min\{T - \underline{w}^K(T), \bar{T}\}}{\min\{T - \underline{w}^K(T), \bar{T}\}}, \\ \underline{w}^0(T) & \text{if } q[\bar{\theta} - 1] < \frac{\min\{T - \underline{w}^0(T), \bar{T}\} - \min\{T - \underline{w}^K(T), \bar{T}\}}{\min\{T - \underline{w}^K(T), \bar{T}\}}. \end{cases}\quad (10)$$

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

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

where I use the fact that $\mathbb{E}[\phi_t^P | \phi_{t-1}^P] = 0$. 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

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

Define

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

which is the difference in signals received by the voter conditional on partisan shock $\bar{\theta}$ or $\underline{\theta}$ being realised. Note that by (3) 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

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

It follows that

$$V_v(T) = \frac{1}{1 - \delta_v} \left[\mathcal{X}^*(T) - \Psi T + \frac{\delta_v}{4\tilde{\phi}} \left[\tilde{\phi}^2 - q(1-q)[\Delta^*(T)]^2 \right] \right]. \quad (11)$$

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 $\chi^*(\hat{T}, \omega^*(\hat{T}), \kappa^*(\hat{T}, \omega^*(\hat{T})), \underline{\theta}) = \bar{T}$, 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 $T - w \leq \bar{T}$.

Equilibria without civil service protections. Here, I characterise equilibria without civil service protections, which provides the proofs for the results listed in Proposition 3.

Step 1. I characterise the hiring strategies of governing parties. First, note that, given any government size T , an equilibrium has junior civil servants engaging in partisan activities (i.e., $\kappa^*(\tau^*, \omega^*(T)) = K$) only if there are no civil service protections, and furthermore in this case it must be that $\sigma_{-P}^{s*}(T, t+1) \neq \sigma_P^*(T, t)$. Both claims follow immediately by evaluating (7) at wage $w = \omega^*(T)$. Second, note that if there are no civil service protections and an equilibrium has junior civil servants not engaging in partisan activities (i.e., $\kappa^*(T, \omega^*(T)) = 0$), then it must be the case that $\omega^*(T) = 0$. To see this

suppose, towards a contradiction, that $\kappa^*(T, \omega^*(T)) = 0$ but that $\omega^*(T) > 0$. Consider a deviation by party P at t in which it hires junior civil servant $j' \in I_t$ that is never hired in equilibrium (i.e., such that $j' \notin \{\sigma_P^*(T, t), \sigma_P^{s*}(T, t+1)\}$ for all P , and note that such a civil servant always exists). By (5) this civil servant would strictly prefer setting $\chi^*(T, w, 0, \theta) = T - w$ for any wage $w = \epsilon$, so that she must set $\chi^*(T, 0, 0, \theta) = T$ for wage $w = 0$. By (4), this deviation strictly increases the winning probability of party P , yielding the desired contradiction. Third, no governing party has an incentive to deviate from these hiring strategies. The only relevant such deviation would be for a governing party P at t to hire, and commit to retain in case of reelection, a junior civil servant j that would be hired in a senior position by party $-P$ at time $t + 1$. However, because this civil servant expects wage $\omega^*(T)$ from $-P$, and the junior civil servant hired in equilibrium by P expects wage 0 in that eventuality, the incentive costs for P are always lower under its equilibrium hiring strategy. Fourth, as long tax T is such that $\omega^*(T) > 0$, these hiring strategies are uniquely optimal. That there exist such values of T will follow from Assumption 2 and the arguments leading to (14) below. Finally, let $\underline{w}^{0,n}(T)$ denote the minimal wage $\underline{w}^0(T)$ that ensure public goods provision from (9), evaluated in an equilibrium without civil service protections. Note that the two previous claims ensure that, in any equilibrium without civil service protections (i.e., whether it has partisan participation by civil servants or not), we can set $\underline{w}^{0,n}(T) = 0$ for all taxes T .

Step 2. To study optimal civil servant partisanship and wages, note that it follows from the previous steps that, in any equilibrium without civil service protections, junior civil servants' partisan participation strategies (7) can be rewritten as

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

Furthermore, let $\underline{w}^{K,n}(T)$ denote the minimal wage $\underline{w}^K(T)$ that ensure the production of partisan goods from (9), evaluated in an equilibrium without civil service protections. If well-defined, we have that

$$\underline{w}^{K,n}(T) = \min \{w \geq 0 : K = \delta_c [\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0)] u(w)\}. \quad (12)$$

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

that

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

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

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

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

$$W(T) \equiv \max_{0 \leq w \leq T} \delta_c [\mathbb{P}^*(T, w, K) - \mathbb{P}^*(T, w, 0)] u(w) \geq K. \quad (13)$$

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

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

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) $W(\bar{T}) < K$, so that $\underline{w}^{K,n}(T)$ is never defined; (ii) there exists government size $0 < \tilde{T} \leq \bar{T}$ 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 civil servants are nonpartisan (even though they are indifferent). Therefore, to unify notation, I will also define $\tilde{T} = \bar{T}$ under case (i), although here given this tax revenue junior civil servants 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 civil service protections, when the government is larger, the conflict of interest between parties and civil servants 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 (12), we have that

$$\begin{aligned} K &= \frac{1}{2\tilde{\phi}} [q[\bar{\theta} - 1][T' - \underline{w}^{K,n}(T')]] u(\underline{w}^{K,n}(T')) \\ &= \frac{1}{2\tilde{\phi}} [q[\bar{\theta} - 1][T - \underline{w}^{K,n}(T)]] u(\underline{w}^{K,n}(T)). \end{aligned}$$

It follows that

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

and, because

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

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

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

which contradicts (12).

We can rewrite the parties' wage policies from (10) as

$$\omega^*(T) = \begin{cases} \underline{w}^{K,n}(T) & \text{if } T \geq \tilde{T} \text{ and } q[\bar{\theta} - 1] > \frac{\underline{w}^{K,n}(T)}{T - \underline{w}^{K,n}(T)}, \\ 0 & \text{if } T < \tilde{T} \text{ or if } T \geq \tilde{T} \text{ and } q[\bar{\theta} - 1] < \frac{\underline{w}^{K,n}(T)}{T - \underline{w}^{K,n}(T)}. \end{cases} \quad (14)$$

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, $q[\bar{\theta} - 1] > \frac{\underline{w}^{K,n}(T)}{T - \underline{w}^{K,n}(T)}$ 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 (11), 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 $T - \underline{w}^{K,n}(T) \leq \bar{T}$, we have that $\Delta^*(T) = [\bar{\theta} - 1][T - \underline{w}^{K,n}(T)] > 0$. Suppose, towards a contradiction, that $T^* > \tilde{T}$. It follows that

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

where the first inequality follows because, given $T^* > \tilde{T}$, we have that both $\underline{w}^{K,n}(T^*) > 0$ and $\Delta^*(T^*) = [\bar{\theta} - 1][T^* - \underline{w}^{K,n}(T^*)] > 0$, 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 $T^* = \tilde{T}$.

Equilibria with civil service protections. Here, I characterise equilibria with civil service protections, which provides the proofs for the results listed in Proposition 4.

Step 1. To study the impact of exogenous civil servant selection, first note that with civil service protections and given any government size T there is no equilibrium in which junior civil servants engage in partisan activities. This follows immediately by substituting $w = \omega^*(T)$ in (7), given the fact that all junior civil servants are retained if the governing party is replaced. Second, in contrast to the case with no civil service protections, it is not the case that $\omega^*(T) = 0$ in all equilibria with civil service protections. This occurs for two reasons: (i) a low wage without partisan participation in the absence of civil service protections follows because governments need not provide high-powered incentives to have civil servants provide public goods effort and their ability to fire civil servants implies that wages offered to future civil servants by opposition parties are irrelevant, and (ii) higher wages are necessary to deter the (off the equilibrium path) coopting of civil servants by government. Let $\underline{w}^{0,r}(T)$ denote the minimal wage $\underline{w}^0(T)$ that ensure public goods provision from (9), evaluated in an equilibrium with civil service protections. It follows from (i) that in the absence of civil service protections, we have that $\underline{w}^{0,r}(T) = \omega^*(T)$ in all equilibria. Therefore, this setting has multiple equilibria differentiated by civil servants' 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 civil servants 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 $w^*(T)$ in the civil servants' spending strategies from (5) and (6). Given any T , define $(w^E(T), \underline{w}^E(T))$ such that

$$\underline{w}^E(T) = \arg \max_{0 \leq w \leq T} \delta_c [\mathbb{P}^E(T, w, K) - \mathbb{P}^E(T, w, 0)] [u(w) - u(w^E(T))], \text{ and} \quad (15)$$

$$w^E(T) = \min \left\{ 0 \leq w \leq T : \delta_c [\mathbb{P}^E(T, \underline{w}^E(T), K) - \mathbb{P}^E(T, \underline{w}^E(T), 0)] \cdot [u(\underline{w}^E(T)) - u(w)] \leq K \right\}. \quad (16)$$

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

$$W^E(T, w^E) = \max_{0 \leq w \leq T} \delta_c [\mathbb{P}^E(T, w, K) - \mathbb{P}^E(T, w, 0)] [u(w) - u(w^E)]$$

Recalling (13), first note that $W^E(T, 0) = W(T) \leq K$ for all $T \leq \tilde{T}$ 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 $T \leq \tilde{T}$ we have that $W^E(T, w^E) \leq K$ 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 (8), we have that

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

so that, given the strict concavity of u , it can be verified that the objective in (15) is strictly concave. Therefore, $\underline{w}^E(T)$ is uniquely defined as the solution to the first-order condition

$$-[u(\underline{w}^E(T)) - u(w^E(T))] + [T - \underline{w}^E(T)]u'(\underline{w}^E(T)) = 0. \quad (17)$$

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

$$[u(\underline{w}^E(T)) - u(w^E(T))] - [T - \underline{w}^E(T)]u'(w^E(T))w^{E'}(T) = 0. \quad (18)$$

Combining (18) with (17) yields that

$$\begin{aligned}
w^{E'}(T) &= \frac{u'(\underline{w}^E(T))}{u'(\underline{w}^E(T))} \\
&= e^{-a(\underline{w}^E(T) - w^E(T))} \\
&< 1,
\end{aligned} \tag{19}$$

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 (17) with respect to T (and using (19)) yields that

$$\begin{aligned}
\underline{w}^{E'}(T) &= \frac{u'(\underline{w}^E(T))}{u'(\underline{w}^E(T)) - 1/2[T - \underline{w}^E(T)]u''(\underline{w}^E(T))} \\
&= \frac{1}{1 + a/2[T - \underline{w}^E(T)]} \\
&= \frac{1}{1 + 1/2[e^{a(\underline{w}^E(T) - w^E(T))} - 1]} \\
&< 1,
\end{aligned} \tag{20}$$

where the second equality follows from the fact that $u(x) = 1 - e^{-ax}$, and the third equality follows from using (17) 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

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

Recall from the steps leading up to (10) 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

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

if and only if

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

which holds because the strict concavity of u implies that

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

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

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

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 $\hat{T} - w^E(\hat{T}) = \bar{T}$. Suppose that the government size is $0 \leq T \leq \hat{T}$ and that civil servants receive wage $w^E(T)$ and spend all remaining tax revenue on public goods. From arguments as those that lead to (11), we have that

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

Let $T^{**} \in \arg \max_{0 \leq \hat{T} \leq \hat{T}} V_v^E(T)$. 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

$$T^{**} = \begin{cases} \hat{T} & \text{if } \frac{w^E(\hat{T}) - w^E(\tilde{T})}{\hat{T} - \tilde{T}} < 1 - \Psi, \\ \tilde{T} & \text{if } \frac{w^E(\hat{T}) - w^E(\tilde{T})}{\hat{T} - \tilde{T}} > 1 - \Psi, \end{cases} \quad (21)$$

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 with civil service protections. 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) the civil servants' equilibrium spending and partisan participation strategies are given by (5), (6) and (7), with the additional restriction that $\kappa^*(T, \underline{w}^E(T)) = 0$ (i.e., when offered wage $\underline{w}^E(T)$, junior civil servants resolve their indifference in favour of non-participation) (ii) parties' equilibrium wage policies are described by (10) 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 the civil servant to engage in partisan spending. Furthermore, junior civil servants shirk for any wage $w < w^E(T)$, as it induces junior civil servants 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 civil servants spend on public goods provision). Finally, note that (iii) follows because all equilibria with civil service protections have nonpartisan civil servants, and, by construction of $w^E(T)$ in (16), 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.

Step 5. The final step is to complete the proof of Proposition 5. First, note that because $\hat{T} - w^E(\hat{T}) = \bar{T}$ and $w^{E'}(T) > 0$, we have that \hat{T} is increasing in \bar{T} . Second, as noted in text, \tilde{T} is independent of \bar{T} . Third, from (21), it only remains to establish that

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

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