

# Civil Service and Patronage in Bureaucracies\*

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## Abstract

We develop a model of government personnel policy with electoral competition in an effort to understand when high quality bureaucracies will be created and sustained. In the model, two parties compete for office over an infinite horizon, and politicians in office choose a mix between civil servants (who produce public goods in a good bureaucracy) and patronage appointees (who produce private goods and can influence re-election). Civil servants make future good bureaucracies more likely, and thus personnel policies depend on incumbents' electoral prospects and the anticipated actions of future politicians. Civil service hiring is maximized when both parties value public goods. It is also affected by the electoral vulnerability of the incumbent, but the direction of this relationship depends on characteristics of the opposition, calling into question previous arguments about electoral vulnerability and civil service reforms. Numeric results on long-run behavior suggest that electorally dominant parties can increase long-term bureaucratic quality, electorally weak parties are associated with higher bureaucratic quality, and that polarization reduces bureaucratic quality and amplifies partisan advantages. Finally, we present empirical evidence regarding a core implication of our model about the relationship between party preferences and meritocratic civil service hiring.

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# 1 Introduction

Good governance requires good bureaucracy, where civil servants do the day-to-day work delivering the public goods that government can best provide. But in democracies, politicians who worry about re-election and the policy consequences of losing may lack incentives to create good bureaucracy. Incumbents may instead prefer patronage-based systems that encourage bureaucrats to work on behalf of electoral or other political goals. Such activities undermine professionalism and make it more difficult to achieve good governance.

This paper develops a theory to study this trade-off. Its central purpose is to understand the electoral, ideological, and social factors that affect the creation of good bureaucracies. At the heart of the model is the premise that personnel systems determine bureaucratic production. On one hand, professional civil servants can produce public goods like defense, property rights enforcement, contract enforcement, education, internal security and public infrastructure that benefit the vast majority of citizens, regardless of who controls public office (e.g., Rauch 1995, Rauch and Evans 2000, Krause, Lewis and Douglas 2006, Lewis 2008, Gerber and Gibson 2009). Professional civil servants are largely insulated from political pressure, with policies in place – and respected – that ensure job security and merit-based hiring and promotion.

On the other hand, patronage appointees produce private goods that specifically benefit the party in power. Such private goods can include policies that benefit the party elite, policies that benefit party supporters, and campaign activities that help the party get re-elected (e.g., Pollock 1937, Reid and Kurth 1989, Folke, Hirano and Snyder 2011). Election winners can hire and fire patronage appointees at will, and patronage jobs are at once rewards for helping a party win an election and incentives to help that party win re-election. Patronage-based bureaucrats typically lack the skills, experience and especially the incentives to produce public goods. Even in advanced countries, most bureaucracies mix civil servants and patronage appointees, and the goal of the model is to understand how democratic

competition generates the distribution of personnel and its attendant governance outcomes.

Several features of bureaucracy and political competition are central to our model. First, investing in civil service reform does not automatically produce good governance. In the U.S., for example, federal civil service reform began with the 1883 Pendleton Act, which required merit-based selection of civil servants. But civil servants were not protected from dismissal until the 1912 Lloyd-La Follette Act, and were not restricted from political activities until the 1939 Hatch Act. In addition, the histories of civil service reform in numerous U.S. states show that legislated reforms can be reversed by future political actions. Reforms that persist can also be weakened. In Latin America, most countries have adopted civil service reforms in recent decades but have adopted a range of strategies to circumvent them (Grindle 2012).

This observation implies that the factors that contribute to the existence of high quality bureaucracies – e.g., insulation from political pressure, merit based-hiring and promotion, and competitive salaries – take time to take effect. Thus, investments in the civil service require some anticipated future benefit. Low-quality, patronage-based bureaucracies do not have this feature. Indeed, they are valuable precisely because the incumbent expects a short-term benefit of putting “its own people” in public positions. We therefore consider a dynamic model, where incumbent politicians must anticipate not only how personnel policies affect their current policy choices and electoral prospects, but also how the opposition will approach these issues if it wins the election.

Second, incumbents cannot exploit a good bureaucracy for electoral gain. Voters thus know that civil servants will produce public goods no matter which party is in control, decreasing the salience of bureaucracy to vote choice. Civil service rules also prevent all bureaucrats from knocking on doors at election time, or from engaging in other activities for the benefit of incumbents. By contrast, under a low quality bureaucracy, parties can exploit patronage appointees for electoral gain. Thus, politicians care about government personnel not only because they affect policy outcomes, but also because they can affect elections. The model therefore incorporates differential electoral implications of bureaucratic quality.

Third, parties differ in their induced preferences for high quality bureaucracy. These preferences may be linked to policy. A class-based party, for example, may value public goods like tax enforcement because such enforcement facilitates redistribution. The preferences might also be linked to electoral considerations. An ethnic-based party, for example, may rely on patronage appointments to encourage ethnic political competition. And parties in the same political system may differ in their ability to attract civil servants. This may be a particular issue following transitions from authoritarian rule to democracy, especially if there has been a history of ethnic or racial politics. Following the second Iraq war, for example, the Shia-dominated party that won the first election faced a bureaucracy loyal to the Sunni-dominated government under Saddam Hussein, and most individuals with experience running the state were Sunnis. Even if there had been formal civil service procedures in place, it would have been more challenging for the inexperienced Shia party to hire qualified individuals to produce public goods, which in turn could have increased that party's emphasis on patronage. A similar situation likely existed in South Africa following the fall of apartheid, and in some British colonies following independence. The model therefore allows differences in the parties' preferences for public goods and their costs of hiring civil servants.

These features undergird our model of bureaucratic structure. In the model, two parties compete for power over an infinite horizon. Each party is led by a candidate who can serve in government for up to two periods. The winning candidate chooses the mix of civil servants and patronage appointees. Civil servants contribute to the production of public goods if the bureaucracy is high quality, and also increase the likelihood of a high quality bureaucracy in the subsequent period. Patronage appointments produce private goods in the current period regardless of bureaucratic quality. Each party has an exogenous base probability of winning each election, but under a low quality bureaucracy patronage appointments improve the incumbent party's electoral prospects.

We derive a unique Markov perfect equilibrium of the game, which allows us to address three types of questions about bureaucratic structure. First, following any given election,

what affects the incentives of the winning candidate to invest in the civil service rather than patronage? Second, over the long-run, under what conditions should we expect good governance to prevail? And third, how do politicians' incentives with respect to bureaucratic structure influence electoral competition?

To see the intuition of the equilibrium, consider the situation of a newly elected politician who inherits a low quality bureaucracy. The incentive to hire civil servants is affected not only by the politician's preferences and costs, but also by characteristics of the opposition. This is because investments in civil service take time to bear fruit, and can effect public goods production only in the subsequent period. Additionally, if the politician is not re-elected, the public goods that will be produced in the subsequent period will increase as the opposition has greater incentives to produce public goods. Thus, a politician will hire more civil servants when there are dynamic complementarities; i.e., if the opposition places a high value on public goods and has low costs of civil service hiring. These features of the opposition matter more when the incumbent is electorally vulnerable.

This observation highlights a considerable challenge of creating a high quality bureaucracy where none exists. A collective action problem of sorts emerges from the fact that the party that initially invests in good government bears a cost (forgoing the electoral benefits of patronage while reaping no public goods) that the other party does not. Thus, each party prefers that the other make the initial investment. To overcome this problem, it is not enough for the incumbent party to have characteristics that foster good governance. If there are competitive elections, it is crucial that the opposition has these characteristics as well.

Our theory unifies two common but conflicting accounts linking incumbent electoral vulnerability and with political reforms such as civil service systems. One view is that incumbents will undertake reform when they are electorally vulnerable in order to constrain or induce particular policy choices of future politicians (Moe 1989, Geddes 1994, de Figueiredo 2002, Ruhil and Camões 2003, Lewis 2008, Besley and Persson 2011, Ting, Folke, Hirano, and Snyder 2013, Lavertu 2013, Mueller 2015). The opposite argument is that incumbents

undertake reform when they are electorally secure. This perspective treats reforms as an “investment,” and politicians need the assurance of remaining in power in order to reap the benefits of reform (Besley and Persson 2010, Acemoglu, Ticchi, and Vindigni 2011). Our results suggest that the direction of the relationship depends on the characteristics of the opposition. When the opposition favors private goods, the incumbent has less to gain from a good bureaucracy and more to gain from patronage appointees who can help win re-election. In this situation, the investment logic prevails and civil service hires should *decrease* with electoral vulnerability. That is, reform is useful in this situation because the incumbent can expect the opposition party to produce public goods if it wins.

We exploit the Markov structure of the equilibrium to arrive at numerical results on the persistence of bureaucratic quality and the long-run probabilities of a high quality bureaucracy. This analysis suggests that electoral competition – where no party has a large electoral advantage – will maximize bureaucratic quality only under quite limited conditions. In particular, there need to be even costs of civil service hiring across parties, and low party system polarization. Otherwise, long-run bureaucratic quality is maximized when the electorally advantaged party also has low costs. Yet interestingly, the opposition party is able to reap the benefits of this investment, as the electorally disadvantaged party will more frequently govern with a good bureaucracy.

Our numerical results also demonstrate that polarization creates a consequential electoral role for the bureaucracy. When party system polarization is high, personnel strategies help to entrench the electoral security of the favored party, particularly when the favored party has higher costs of hiring civil servants. When polarization is low, personnel strategies have a much weaker relationship with electoral outcomes. Thus, the model suggests that patronage-based systems persist in countries where there is high polarization across parties or groups and electorally advantaged parties do not have a cost advantage in civil service hiring.

In addition to developing the theoretical model, we use cross-national data to provide two types of empirical evidence relevant to our model. First we show that countries that are

most meritocratic in their civil service hiring practices also have the highest levels of good government. Second, we examine the link between party preferences and civil service hiring by assuming that a reasonable proxy for whether parties are oriented more towards providing public or private goods is the degree to which parties receive support from specific ethnic groups. When parties tend to receive support from different ethnic groups, they should have weaker incentives to produce public goods that benefit all citizens equally. Our cross-national data show that ethnic diversity itself is unrelated to lower levels of meritocratic hiring but the ethnification of parties is associated with lower levels of such hiring.

The paper proceeds as follows. Section 2 describes the model and section 3 describes the equilibrium. Sections 4 and 5 analyzes comparative statics, with section 4 focusing on incentives politicians have to invest in civil service and section 5 focusing on the on long-run numerical results about bureaucratic quality and electoral impacts. Section 6 provides our empirical results and section 7 concludes.

## 1.1 Related Literature

Our model joins an emerging body of theoretical work on the relationship between elections and bureaucrats. The distinction between the production of political appointees and civil servants resembles that of Rauch's (1995) study of U.S. municipal governments. More recent models that incorporate electoral concerns include Ujhelyi (2014) and Nath (2015). All of these papers focus on the incentives of bureaucrats, while we focus on the long-run behavior of politicians and leave bureaucratic behavior non-strategic. One exception that explores politician's personnel policy choices over an infinite horizon is Ting, Folke, Hirano, and Snyder (2013), who consider a simpler environment with non-reversible civil service reforms.

A closely related and now extensive literature explores the origins of civil service reform (Knott and Miller 1987, Johnson and Libecap 1994, Horn 1995, Gailmard and Patty 2007, Hollyer 2011). Elections typically play a prominent role in these accounts, and the

lock-in arguments described previously have also featured prominently in arguments about judicial independence (e.g., Ramseyer 1994, Stephenson 2003) and state politicization (e.g., Grzymala-Busse 2003). Some of the non-electoral factors emphasized include interest group politics, economic development, expertise, and the costs of patronage systems.

A number of recent papers have explored the political determinants of dynamic public goods provision (e.g., Azzimonti 2011). Our emphasis on its institutional foundations relates to a growing scholarly interest in “state capacity” (Huber and McCarty 2004, Ting 2011), which has sometimes been interpreted as the ability to collect taxes (Besley and Persson 2010). The theoretical approach most closely related to ours is Acemoglu, Ticchi, and Vindigni (2011), who develop a theory of redistribution and state efficiency with an infinite horizon model that features electoral competition and endogenous taxes, pork, bureaucratic quality, and bureaucratic size. Their paper shares our assumptions about the constraints of bureaucratic quality on policy and the effect of personnel choices on future quality, but it focuses on emerging democracies and how the rich can use inefficient personnel policy to affect redistribution, particularly when inequality is high.

Finally, the model serves as a potential basis for theoretically informed empirical research on government personnel systems and the quality of government. Numerous authors have documented the effects of public sector employment on electoral outcomes in the U.S. (e.g., Folke, Hirano and Snyder (2011) and elsewhere (e.g., Roett 1999, Golden 2003). In our view, a logical next step would be to address directly the relationships between personnel policies and measures of the quality of governance (Knack and Keefer 1995, La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1999, Rauch and Evans 2000).

## 2 Model

The model features partisan elections and personnel decisions over an infinite horizon. There are two political parties,  $A$  and  $B$ , each of which produce a sequence of identical candidates,



with one drawn each period. A newly elected candidate may hold office for up to two periods, and cares about retaining office and policies over both periods of political life regardless of whether she is re-elected. The politician in office determines the distribution of government personnel, which affects the quality of the bureaucracy, the production of public and private goods, and the probability that the incumbent can be re-elected. There is no discounting. If a sitting incumbent is in her first term, she becomes her party's candidate in the subsequent election. Otherwise, the party draws a new candidate.

The bureaucracy is composed of a unit measure of non-strategic bureaucrats, who can be of two types: *civil servants* can produce public goods that benefit both parties, while *patronage* appointees can produce private goods that benefit only the incumbent party. Patronage appointees can also directly enhance the incumbent party's chance of re-election (see below). In each period,  $t$ , the a party  $i$  politician chooses the proportion of civil servants  $c_i^t \in [0, 1]$ . The remaining  $1 - c_i^t$  bureaucrats are patronage appointees.

The composition of the bureaucracy affects its quality, denoted by  $q^t \in \{0, 1\}$ . A *bad* bureaucracy ( $q^t = 0$ ) can produce private but not public goods. A *good* bureaucracy ( $q^t = 1$ ) has the combination of professionalism, talent and insulation from political pressure necessary to produce public goods. Importantly, incumbents cannot instantly establish good bureaucracies; civil service rules and procedures take time to develop and take hold. Thus, bureaucratic quality is determined by personnel choices in the previous period. If party  $i$  was in power in period  $t - 1$ , then the bureaucracy is good in period  $t$  with probability  $\Pr\{q^t = 1 \mid c_i^{t-1}\} = c_i^{t-1}$  and bad with probability  $\Pr\{q^t = 0 \mid c_i^{t-1}\} = 1 - c_i^{t-1}$ . Thus, the probability of a good bureaucracy in period  $t$  is increasing in the previous period's level of civil servants, and is also independent of quality in preceding periods.

Public goods production under a good bureaucracy in period  $t$  with a party  $i$  incumbent is given by  $c_i^t$ . Private goods production does not depend on bureaucratic quality, and is given by  $1 - c_i^t$ . Politicians can therefore exploit a good bureaucracy by hiring civil servants, and in so doing, they increase the probability of a good bureaucracy in the future. Incentives

to produce public and private goods can vary across parties. Let  $w_i \in [0, 1]$  denote party  $i$ 's marginal valuation of public goods, and let  $1 - w_i$  be its marginal valuation of its own private goods. Party  $i$ 's valuation of party  $j \neq i$ 's private goods is 0. The parameter  $w_i$  is an inverse measure of party  $i$ 's policy extremism: as  $w_i$  increases,  $i$  becomes more interested in the mutually beneficial policy. Thus, we say that party system polarization increases as  $w_A$  and  $w_B$  both decrease.

Politicians face two kinds of costs. First, each incumbent politician incurs a fixed cost  $k \in [0, 1]$  for losing her re-election bid.<sup>1</sup> This assumption assures that no politician can be better off from losing than from winning, and can be considered a simple form of office motivation. Second, the relative costs of hiring civil servants as opposed to patronage appointees can vary within and across parties. The cost to a party  $i$  politician of  $c_i^t$  civil servants is  $\beta_i(c_i^t)^2$ , and the cost of the remaining  $1 - c_i^t$  patronage appointees is  $\alpha_i(1 - c_i^t)^2$ , where  $\alpha_i = 2 - \beta_i$  and  $\beta_i \in (\frac{1}{2}, \frac{3}{2})$ .

A party  $i$  politician's utility from bureaucratic appointments in period  $t$  can therefore be written as follows:

$$u_i(c^t, q^t) = \begin{cases} q^t w_i c_i^t + (1 - w_i)(1 - c_i^t) - \beta_i(c_i^t)^2 - \alpha_i(1 - c_i^t)^2 & \text{if party } i \text{ is in power} \\ q^t w_i c_j^t & \text{if party } j \neq i \text{ is in power.} \end{cases} \quad (1)$$

Bureaucratic appointments can influence election outcomes. Each party  $i$  has a base re-election probability of  $\gamma_i \in (0, 1)$ , where  $\gamma_A = 1 - \gamma_B$ . When the bureaucracy is good, patronage appointments do not affect election prospects because the civil service system ensures that even patronage appointees cannot undertake activities that benefit the incumbent's electoral prospects. When the bureaucracy is bad, patronage appointees improve the incumbent party's election prospects. Thus, if  $i$  is an incumbent eligible for re-election at

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<sup>1</sup>We bound  $k$  so that its magnitude can be no greater than the maximal policy benefit in a given period.

time  $t$ , her re-election probability is given by:

$$\rho_i(c_i^t, q^t) = \gamma_i + (1 - q^t)m_i(1 - c_i^t), \quad (2)$$

where  $m_i \in (0, 1 - \gamma_i)$  measures the effectiveness of patronage appointees at delivering votes. The opposition party wins the election with probability  $1 - \rho_i(q^t)$ . In what follows, we assume that  $m = m_A = m_B$ , though this assumption is not necessary for the results.

The model captures a number of incentives in the choice of a personnel system. Professional civil servants can provide public goods when the bureaucracy is good, and also improve the chances that a good bureaucracy will be sustained in the future. First term incumbents may then invest in civil servants not only to produce public goods if they are re-elected, but also to benefit from public goods if they lose their re-election bids. By contrast, patronage appointees produce private goods for the incumbent, and can be used to maintain power when the bureaucracy is bad. A newly-elected politician therefore faces different trade-offs depending on inherited bureaucratic quality, but must always consider the future ability to produce public goods.

We derive a unique Markov Perfect equilibrium, and therefore dispense with notation for time periods in what follows. The state variables are given by the triple  $(i, n, q)$ , where  $i \in \{A, B\}$  is the party in power,  $n \in \{1, 2\}$  is the term of the current incumbent, and  $q \in \{0, 1\}$  is bureaucratic quality. Denoting the set of states by  $\mathcal{S}$ , each party's strategy is a mapping  $\mathcal{S} \rightarrow [0, 1]$  from the state space to a level of civil service appointments. For convenience, we denote the civil service appointments by a party  $i$  politician in her  $n$ -th term of office under bureaucratic quality  $q$  by  $c_i^{nq}$ , so for example civil service hiring by a newly elected Party  $A$  politician who inherits a bad bureaucracy is  $c_A^{10}$ .

Using this notation, the expected utility of a newly-elected (first-term) party  $i$  incumbent as a function of her level of civil service appointments  $c$  and bureaucratic quality  $q$  can be

written as follows:

$$\begin{aligned}
EU_i(c|s) = & u_i(c, q) + \rho_i(c, q) [cu_i(c_i^{21}, 1) + (1 - c)u_i(c_i^{20}, 0)] + \\
& (1 - \rho_i(c, q)) [cu_i(c_j^{11}, 1) + (1 - c)u_i(c_j^{10}, 0) - k]. \tag{3}
\end{aligned}$$

The first term is the utility in the current period (as described in equation (1)) from the public and private goods that are produced as a function of  $c$ , as well as the cost of her personnel appointments. The second term in equation (3) is the probability of re-election  $\rho_i(\cdot)$  and her payoff conditional upon re-election, and the third term analogously expresses the case where party  $j \neq i$  wins the election and sets future personnel policy. In both cases, bureaucracy quality is good in the subsequent period with probability  $c$ . Thus the choice of  $c$  affects  $i$ 's expected utility through immediate bureaucratic production, its possible effect on re-election, and future bureaucratic quality.

### 3 Equilibrium

We begin by solving for  $c_i^{2q}$ , or the personnel choices of second term party  $i$  politicians. A second term politician simply chooses the level of civil service that maximizes her utility according to (1). The stage utility function is concave for all  $c \in [0, 1]$  with a second derivative of  $-4$ , and thus  $i$ 's optimal level of civil service hires is:

$$c_i^{2q} = \frac{3 + w_i(1 + q) - 2\beta_i}{4}. \tag{4}$$

This expression is obviously interior for all  $q$ .

When choosing the level of civil servants in the first period, the politician anticipates that she will adopt  $c_i^{2q}$  if re-elected. She further anticipates how her choice will affect not only her probability of re-election, but also what a party  $j$  politician would choose. To this

end, it is helpful to consider the possible payoffs a newly elected politician could face in the subsequent period. There are four cases:

1. Win re-election and inherit a bad bureaucracy;
2. Win re-election and inherit a good bureaucracy;
3. Lose re-election and the other party inherits a bad bureaucracy;
4. Lose re-election and the other party inherits a good bureaucracy.

In equilibrium, the payoff from each of these cases can be seen as a component of equation (3). The first case yields the newly elected party  $i$  politician  $u_i(c_i^{20}, 0)$ , and the second case,  $u_i(c_i^{21}, 1)$ . Substituting (4) into the stage payoff (1) produces:

$$u_i(c_i^{20}, 0) = \frac{w_i^2 + (1 - 2\beta_i)^2 - 2w_i(1 + 2\beta_i)}{8} \quad (5)$$

$$u_i(c_i^{21}, 1) = \frac{(1 + 2w_i - 2\beta_i)^2}{8}. \quad (6)$$

This implies that  $u_i(c_i^{20}, 0) < u_i(c_i^{21}, 1)$ ; i.e., a re-elected politician strictly benefits from a good bureaucracy.

In the third case, the party  $i$  incumbent anticipates no public goods and also no party  $i$  private goods. Thus, we have:

$$u_i(c_j^{10}, 0) = 0. \quad (7)$$

The solution for the fourth case is less straightforward, as it involves the opposition party  $j$ 's civil service hiring, which itself depends on  $i$ 's anticipated civil service hiring. However, substituting expressions (5)-(7) into the incumbent's objective (3) greatly simplifies the problem, and the resulting objective is concave in  $c$ .<sup>2</sup> Our first result characterizes the

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<sup>2</sup>Concavity is demonstrated in the proof of Proposition 1.

unique equilibrium level of civil servants chosen by new politicians. The result is stated in terms of  $\Omega_i = u_i(c_j^{11}, 1)$ , which is a party  $i$  first-term incumbent's stage game payoff when she is not re-elected and the bureaucracy is good. All proofs are found in the Appendix.

**Proposition 1** Civil Servants for First Term Politicians. *In the unique Markov perfect equilibrium, the interior solution is*

$$c_i^{10} = \frac{1}{2} + \frac{3w_i^2\gamma_i - m(8k + w_i^2 + (1 - 2\beta_i)^2 - 2w_i(1 + 2\beta_i)) + w_i(8 + (6 - 4\beta_i)\gamma_i) + 8(1 - 2\beta_i + (1 - \gamma_i)\Omega_i)}{32 + 2m(3w_i^2 + w_i(6 - 4\beta_i) - 8\Omega_i)}, \quad (8)$$

$$c_i^{11} = \frac{1}{2} + \frac{3w_i^2\gamma_i + w_i(16 + (6 - 4\beta_i)\gamma_i) + 8(1 - 2\beta_i + (1 - \gamma_i)\Omega_i)}{32}, \quad (9)$$

where

$$\Omega_i = \frac{w_i(96 - 64\beta_j + 12w_j^2(1 - \gamma_i) + w_j(88 - 16\beta_j(1 - \gamma_i) - 16\beta_i\gamma_i + 3w_i^2\gamma_i^2 + 2w_i\gamma_i(8 + 3\gamma_i - 2\beta_i\gamma_i)))}{8(16 - w_iw_j(1 - \gamma_i)\gamma_i)}.$$

Along with expression (4), Proposition 1 characterizes the unique interior equilibrium personnel strategies. We focus on the interior solutions for the remainder of the paper, and note that corner solutions for the personnel choices of newly elected politicians exist only for some extreme parameter values.

Comparing policy choices across periods provides a first glimpse at the roles of bureaucratic quality and electoral concerns. It is easily verified that  $c_i^{11} > c_i^{21}$ , as the maintenance of a good bureaucracy strictly increases a new politician's incentive to hire civil servants. By contrast, the relationship between  $c_i^{10}$  and  $c_i^{20}$  is ambiguous. This is because a new politician additionally takes her election prospects into account when choosing  $c$  under a low quality bureaucracy.

The comparative statics on personnel strategies with respect to the incumbent party's cost and preference parameters are straightforward to derive and summarized in the following comment. Regardless of bureaucratic quality, civil service hiring is increasing in the

incumbent's valuation of public goods and decreasing in its cost of hiring civil servants. Additionally, it can be shown that civil service hiring is decreasing in  $m$  when  $k$  is high enough for politicians to want re-election. As the next sections will show, the results for electoral advantage and characteristics of the opposition party are somewhat less intuitive.

**Comment 1** Basic Comparative Statics. *When a first term party  $i$  politician inherits a bureaucracy of quality  $q$ ,*

$$\frac{\partial c_i^{1q}}{\partial w_i} > 0 \quad \text{and} \quad \frac{\partial c_i^{1q}}{\partial \beta_i} < 0.$$

## 4 Investing in Good Government

What factors influence the creation of good bureaucracy where none exists? Suppose that party  $A$ 's candidate has won the election and must decide how much to invest in civil service (i.e.,  $c_A^{10}$ ) and patronage, and that party  $B$  is in opposition, and will thus make its own personnel choice if  $A$  loses. We consider three factors that affect  $A$ 's investment: characteristics of the opposition, party system polarization, and the electoral environment.

### 4.1 Opposition Characteristics

When  $A$  inherits a bad bureaucracy, the value of investing in civil service lies strictly in the future because civil servants cannot produce public goods in the current period. If  $A$  wins re-election, she will adopt her optimal level of civil service according to equation (4), which is independent of any characteristic of  $B$ . But if  $A$  loses re-election, she receives a payoff in the next period only if  $B$  produces public goods, which can only occur if  $A$ 's investment in civil service produces a good bureaucracy.  $A$ 's payoff from hiring civil servants is therefore affected by characteristics of  $B$  that affect  $B$ 's incentives to hire civil servants if  $B$  inherits a good bureaucracy.

One such characteristic is  $\beta_B$ , or party  $B$ 's cost of hiring civil servants as opposed to patronage appointees. Even in fully functioning democracies, it takes some skills and experience to maximize bureaucratic output, and not all parties will have the same level of skills and experience. After a democratic transition, for example, there may be an opposition party that has little or no ministerial experience. And if the opposition represents groups that have been subject to discrimination under an authoritarian regime, there may even be a relatively small pool of talented individuals the party can tap to help run the state. The model captures such differences across parties (and the groups they may represent) through the  $\beta$  parameters. Since an increase in  $\beta_B$  reduces  $B$ 's incentive to hire civil servants, it will also reduce the value of good bureaucracy to  $A$  and hence  $A$ 's civil service hiring as well.

A second crucial characteristic is the extremism of party  $B$ 's preferences. As  $w_B$  increases,  $B$  increasingly values public over private goods, and thus wants to design the bureaucracy to produce outcomes of value to  $A$ . As Comment 1 establishes, this causes  $B$  to hire more civil servants for any level of inherited quality. Holding  $A$ 's preferences fixed, then, the propensity for  $A$  to hire civil servants also increases with  $w_B$ . Proposition 2 summarizes these results. Combined with Comment 1, it implies cross-party complementarities in the cost and preference parameters: for a new party  $A$  politician, the comparative statics on hiring with respect to  $\beta_B$  and  $w_B$  have the same sign as those for  $\beta_A$  and  $w_A$ , respectively.

**Proposition 2** *Opposition Characteristics and Civil Service Hiring. When a first term party  $A$  politician inherits a bureaucracy of quality  $q$ ,*

$$\frac{\partial c_A^{1q}}{\partial w_B} > 0 \quad \text{and} \quad \frac{\partial c_A^{1q}}{\partial \beta_B} < 0.$$

Proposition 2 emphasizes a cooperation problem that exists in the *creation* of good governance. Any investment by party  $A$  in civil service will reap no benefits for  $A$  if  $A$  loses an election and  $B$  has little incentive to hire civil servants. Thus, creating a good bureaucracy



requires cooperation across parties. The prospect of such cooperation will diminish when the other party has relatively high costs of civil service or relatively extreme preferences. Even when  $A$  inherits a good bureaucracy, incentives to invest in civil service will diminish when  $B$  has extreme preferences or high civil service hiring costs.

## 4.2 Party System Polarization

Another measure of party systems of interest is party system polarization, which is a situation where *both*  $A$  and  $B$  want to produce private goods. We can capture the inverse of polarization in a single parameter by assuming  $w = w_A = w_B$ . Proposition 3 shows that investment in civil service is decreasing in party system polarization, regardless of whether  $A$  inherits a good or bad bureaucracy. The result follows directly from the application of Comment 1 and Proposition 2.

**Proposition 3** Party System Polarization. *Let  $w = w_A = w_B$ . Then:*

$$\frac{\partial c_A^{10}}{\partial w} > 0 \quad \text{and} \quad \frac{\partial c_A^{11}}{\partial w} > 0.$$

Polarized party systems, then, are bad for good government in a competitive democracy. When both parties use the bureaucracy for electoral gain and private goods production, they will be unable to “cooperate” by sustaining consistently high civil service hiring. Thus, the model suggests that electoral systems and social structures that encourage centripetal rather than centrifugal party competition will help in the creation of good bureaucracy.

## 4.3 Electoral Context

Next consider the electoral context. As noted in the introduction, scholars have emphasized that politicians may wish to invest in the civil service when they are electorally vulnerable

as a way to improve outcomes if they fall out of power. The typical mechanism in these arguments is some form of *lock-in*. If an incumbent party expects to lose an election, the argument goes, rigid civil service procedures can make it difficult for the electoral foe to change policy, or to divert the bureaucracy's actions to its own private ends. Civil service, then, emerges from conflict and distrust between parties.

The model here departs from this lock-in logic in one important respects. The first concerns the mechanism by which an incumbent faced with electoral loss might benefit from hiring civil servants. When the bureaucracy is bad, an investment in the civil service can reap only a future benefit. And the future benefit will be realized only if the opposition *hires civil servants* after winning. The opposition cannot be forced to do so; that is, its hands cannot be tied. Thus, rather than tying the hands of the other party, the incumbent invests in civil service to encourage the opposition party to also invest in civil service, and thus to produce public goods. This perspective suggests that good bureaucracy requires – and emerges from – synergistic commitments to civil service that exist across parties, rather than from conflict and distrust between them.

A key feature of our model is that decisions about bureaucratic structure can affect electoral outcomes. Since vulnerable incumbents can choose personnel structures that increase their chances of re-election, and hiring civil servants carries an electoral cost, investment in civil service need not increase with electoral vulnerability, as the lock-in logic argues. The model predicts that both positive and negative relationships between electoral vulnerability and civil service investment are possible, and the direction of the effect depends on the expected benefits to the incumbent of creating good government for the opposition.

As an example, if the opposition's preferences are relatively moderate (so that  $w_B$  is relatively high), as  $A$  becomes more electorally insecure, she benefits in the future from a good bureaucracy because so doing will give  $B$  an incentive to appoint civil servants. This situation therefore results in a relationship that is consistent (in direction) with that of lock-in arguments: the more electorally insecure the incumbent, the more the incumbent invests

in civil service. However, as  $B$ 's preferences become more extreme,  $A$  has less to gain from investing in civil service (because the future production of public goods when  $B$  wins will be lower). This weakens the relationship between  $\gamma_A$  and civil service investment. Figure 1 depicts how the equilibrium level of civil servants changes with  $\gamma_A$  at different values of  $w_B$ .

If  $B$ 's preferences become sufficiently extreme (i.e.,  $w_B$  sufficiently low), the direction of the effect of  $\gamma_A$  on civil service investment can change. The future value to  $A$  of a good bureaucracy under  $B$  is low if  $B$  has little desire for public goods. This increases  $A$ 's incentives to get re-elected and encourages the hiring of patronage appointees. But as  $A$ 's electoral security increases, she will have an increasing incentive to appoint civil servants in order to take advantage of the public goods they may produce upon re-election. Thus, we have the opposite of the lock-in argument: the optimal level of civil servants is *increasing* in  $\gamma_A$  at sufficiently low  $w_B$ . We can see this in Figure 1, where civil service investment is increasing in  $\gamma_A$  when  $w_B$  is low.

By an identical logic, the direction and magnitude of the effect of  $\gamma_A$  on hiring varies with civil service personnel costs  $\beta_B$ . A high value of  $\beta_B$  plays a similar role to a low value of  $w_B$ :  $A$  will reap little in terms of public goods if she creates a good bureaucracy and  $B$  wins. Thus,  $A$  has considerable incentive to hire patronage appointees to avoid losing, creating a positive relationship between  $\gamma_A$  and civil service hiring, contrary to the lock-in argument. This relationship is reversed when  $\beta_B$  is low.

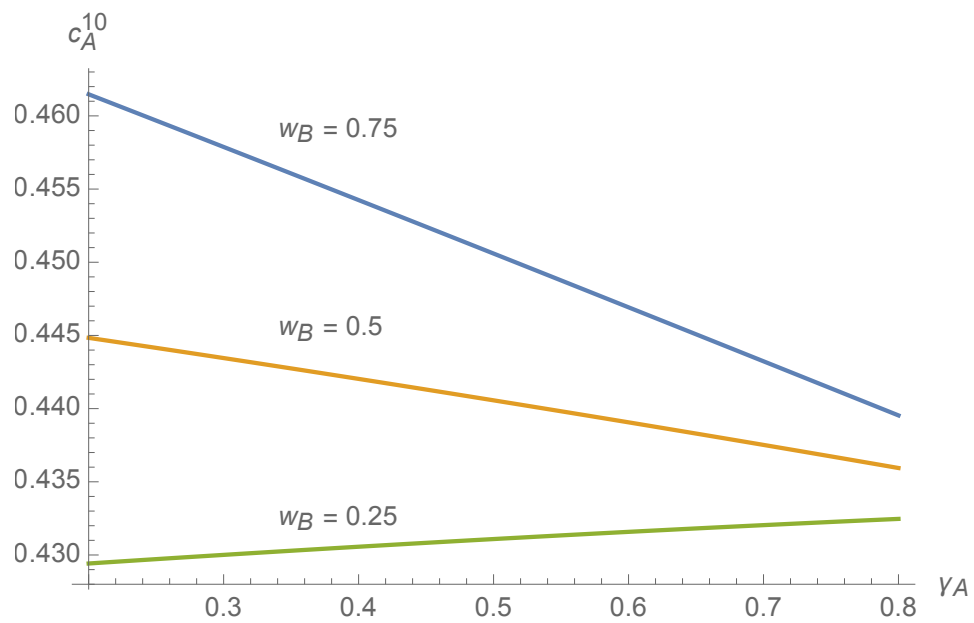
Proposition 4 formally states how the effect of electoral security on government employment depends on  $w_B$  and  $\beta_B$ , under both good and bad bureaucracies. We obtain stronger results in the former case, where the relationship between  $\gamma_A$  and  $c_A^{11}$  changes monotonically with  $w_B$  and  $\beta_B$ . However, the preceding intuitions essentially hold for both cases.<sup>3</sup>

**Proposition 4** Electoral Context.  $\frac{\partial c_A^{10}}{\partial \gamma_A}$  and  $\frac{\partial c_A^{11}}{\partial \gamma_A}$  can be positive or negative, and

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<sup>3</sup>The cross-partial derivatives for  $c_A^{11}$  imply not only that the effect of electoral vulnerability depends of the opponent's preferences and costs of civil service, but also that the effects of the opponent's preferences and costs of civil service are conditional on  $\gamma_A$ .

Figure 1: Electoral Security and Civil Service Hiring



Note: Here  $m = 0.2$ ,  $\beta_A = \beta_B = 1$ ,  $w_A = 0.5$  and  $k = 0.15$ . When party  $B$  has moderate preferences, civil service hiring is decreasing in  $\gamma_A$ , but as  $B$ 's preferences become more extreme civil service hiring flattens and then becomes increasing in  $\gamma_A$ .

- (i) There exist  $\underline{w}_B^*, \bar{w}_B^* \in [0, 1]$  such that  $\frac{\partial c_A^{10}}{\partial \gamma_A} > 0$  if  $w_B < \underline{w}_B^*$ , and  $\frac{\partial c_A^{10}}{\partial \gamma_A} < 0$  if  $w_B > \bar{w}_B^*$ .
- (ii) There exists  $\beta_B^* \in [1/2, 2]$  such that  $\frac{\partial c_A^{10}}{\partial \gamma_A} < 0$  for  $\beta_B < \beta_B^*$ , and  $\frac{\partial c_A^{10}}{\partial \gamma_A} > 0$  for  $\beta_B > \beta_B^*$ .
- (iii)  $\frac{\partial^2 c_A^{11}}{\partial \gamma_A \partial w_B} < 0$  and  $\frac{\partial^2 c_A^{11}}{\partial \gamma_A \partial \beta_B} > 0$ .

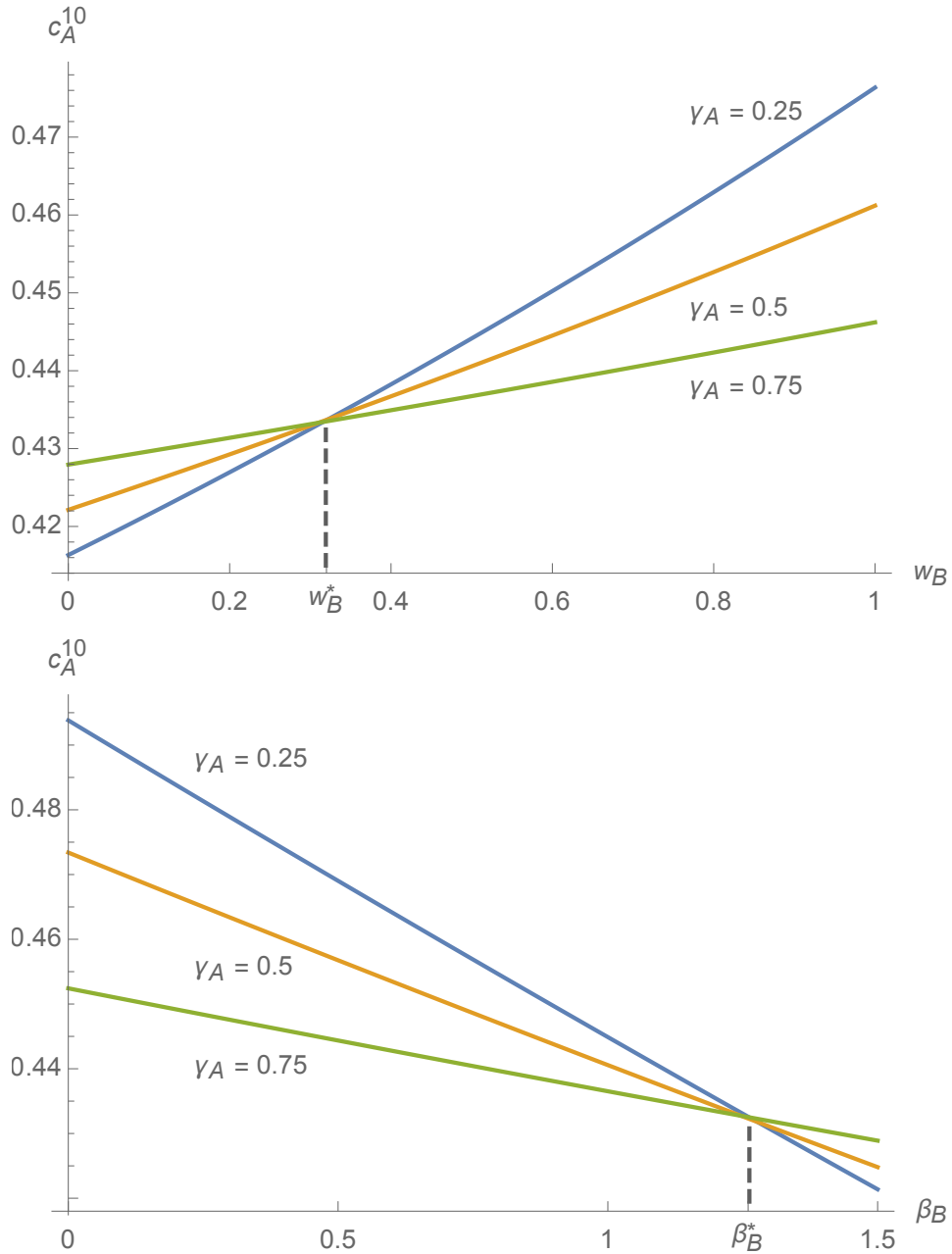
Figure 2 illustrates the relationships described in Propositions 2 and 4. The top panel depicts the relationship between  $w_B$  and civil service investment at different levels of  $\gamma_A$ . As Proposition 2 states,  $A$ 's investment in civil service is always increasing in  $w_B$ . But by Proposition 4, the effect of  $w_B$  is decreasing as electoral security increases. Consistent with Figure 1, Figure 2 also depicts how the direction of the effect of  $\gamma_A$  can change with  $w_B$ . For values of  $w_B$  below a critical value  $w_B^*$ , civil service investment increases as electoral security increases, but when  $w_B > w_B^*$ , the opposite is true. And near  $w_B^*$ , the effect of electoral security on civil service investment is quite small, but it grows in absolute magnitude as  $w_B$  moves away from  $w_B^*$ . Note that while Proposition 4 only establishes the (possibly different) thresholds  $\underline{w}_B^*$  and  $\bar{w}_B^*$ , in this example these thresholds coincide. The figure therefore suggests that  $\frac{dc_A^{10}}{d\gamma_A}$  will be monotonic in many applications.

The bottom panel of Figure 2 depicts an analogous example for  $\beta_B$ .  $A$ 's civil service investment is always decreasing as the opposition's cost of civil services increase (Proposition 2), but by Proposition 4, the magnitude of the effect of  $\beta_B$  is largest when the incumbent is most electorally vulnerable. And the direction of the effect of  $\gamma_A$  depends on whether  $\beta_B$  is larger or smaller than the critical value  $\beta_B^*$ .

## 5 Long-Run Governance Outcomes

The previous section highlights factors that influence the incentives of a politician to invest in civil service after winning an election. But a central motivation for studying a dynamic model is to understand factors influencing whether good government can be sustained over time. Since a winning party can undo what has gone before, good governance requires a

Figure 2: Civil Service Hiring as a Function of  $w_B$ ,  $\gamma_A$  and  $\beta_B$



Note: Here  $m = 0.2$ , and  $k = 0.15$ . In the top panel,  $w_A = 0.5$  and  $\beta_A = \beta_B = 1$ . In the bottom panel,  $\beta_A = 1$  and  $w_A = w_B = 0.5$ . The magnitudes of the effects of  $w_B$  and  $\beta_B$  decrease as  $\gamma_A$  increases. On different sides of the thresholds  $w_B^*$  and  $\beta_B^*$ , the effect of increasing electoral security ( $\gamma_A$ ) reverses.

commitment by both parties to the civil service. For some variables, the static results will be the same as the dynamic ones. For example, if one party's cost of hiring civil servants goes up, both parties will hire more patronage appointees because they are sensitive to their own costs and those of the other party. This reduces the long run probability of good bureaucracy. The same is true for policy preferences. If  $w_i$  increases for either party, both parties have greater incentive hire civil servants, and thus we should expect a higher probability of good governance in the long-run if extremism is low.

The more interesting questions about long-run good governance are therefore related to the electoral environment. When (exogenous) electoral security is increasing for one party it is decreasing for the other, making it unclear how  $\gamma_A$  should be related to the long-run likelihood of good governance. This relationship is all the more complicated by the fact that the direction of the effect of  $\gamma_A$  can change with changes in variables like  $w_i$  and  $\beta_i$ .

Since the Markov perfect equilibrium defines a Markov process over states of play, we can use standard techniques to analyze the long-run behavior of the political system. Recall that the equilibrium states are denoted  $(i, n, q)$ , where  $i$  is the party in power,  $n$  is its term of office, and  $q$  is bureaucratic quality. This defines eight states, as illustrated in Figure 3. The personnel strategies and re-election probabilities characterized in the previous section allow us to write an  $8 \times 8$  matrix  $\mathbf{P}$  of state transition probabilities, where each element  $P_{s,s'} = \Pr\{s \mid s'\}$  gives the probability of transitioning from state  $s$  to state  $s'$  in one period. For example the probability of transitioning from  $(i, 1, q)$  to  $(i, 2, 1)$  – that is, for a first-term party  $i$  incumbent with bureaucratic quality  $q$  to be re-elected with a good bureaucracy – is  $P_{i1q,i21} = \rho_i(c_i^{1q}, q)c_i^{1q}$ . And as no state can repeat itself in consecutive periods, the transition probability from any state  $s$  to itself is  $P_{s,s} = 0$ .

We restrict our analysis to non-corner equilibria where all civil service hiring levels are interior. The first step is to show the existence of a unique limiting distribution  $\phi = (\phi_{A10}, \phi_{A20}, \phi_{A11}, \phi_{A21}, \phi_{B10}, \phi_{B20}, \phi_{B11}, \phi_{B21})$  over the states, which has the property that  $\lim_{n \rightarrow \infty} P_{s,s'}^n = \phi_{s'}$  for all  $s, s'$ . Thus, the long-run probability of state  $s'$  is independent

of the starting state  $s$ . The following result shows this by invoking the basic limit theorem of Markov chains, which requires that the underlying Markov process be recurrent, aperiodic, and irreducible.<sup>4</sup>

**Proposition 5** Limiting Distribution. *If  $c_i^{nq}$  is interior for all states, then there exists a unique limiting distribution  $\phi$  over the states of the equilibrium.*

The distribution  $\phi$  allows us to calculate several informative statistics about sample paths and the distribution of outcomes. Unfortunately, due to the complexity of  $\mathbf{P}$  (in particular the fact that there are no absorbing states in the game), calculating  $\phi$  is not a trivial exercise. We therefore rely on numerical results generated by Mathematica. In the remainder of this section we consider the persistence of bureaucratic quality as well as the long-run probabilities of some sets of states of substantive interest, such as those with good governance or control by a particular party.

## 5.1 Persistence of Bureaucratic Quality

A standard calculation in the analysis of discrete Markov Chains is the distribution of initial “hitting” times for some set of states. This allows us to ask, for instance, the average number of periods it takes to attain good government from either party starting from a newly elected party  $A$  with low quality bureaucracy (i.e., moving from state  $(A, 1, 0)$  to states of the form  $(i, n, 1)$ ). This provides a measure of the persistence of bad governance. Likewise, we can calculate the average time it takes to move to a good bureaucracy, starting from a newly elected party  $A$  with high quality bureaucracy (i.e., moving from state  $(A, 1, 1)$  to states of the form  $(i, n, 0)$ ).

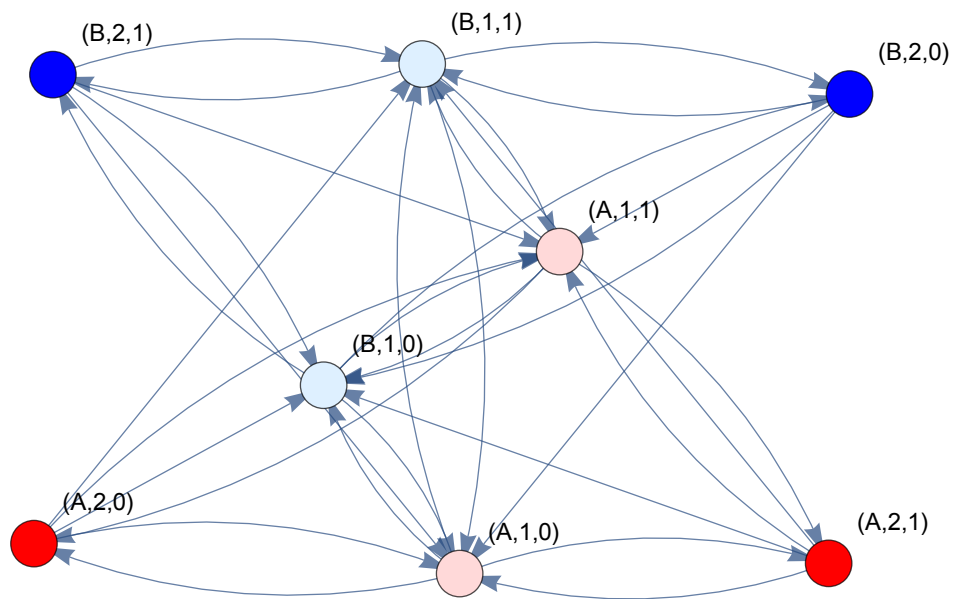
Figure 4 plots these statistics using the same parameters as Figure 2. The results largely confirm the intuitions of our short run comparative statics. As  $w_B$  increases, a new party  $A$  politician is motivated to hire more civil servants, thus hastening the arrival of a good

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<sup>4</sup>For a reference, see Karlin and Taylor (1975).



Figure 3: Equilibrium States and Possible Transitions



Note: Party *A* control in red, party *B* control in blue; light denotes first term and dark denotes second term.

bureaucracy or delaying the arrival of a bad bureaucracy. Electoral advantages also matter: a good bureaucracy is more likely to persist and a bad one more likely to die when the electorally advantaged party has the higher public goods motivation  $w_i$ .

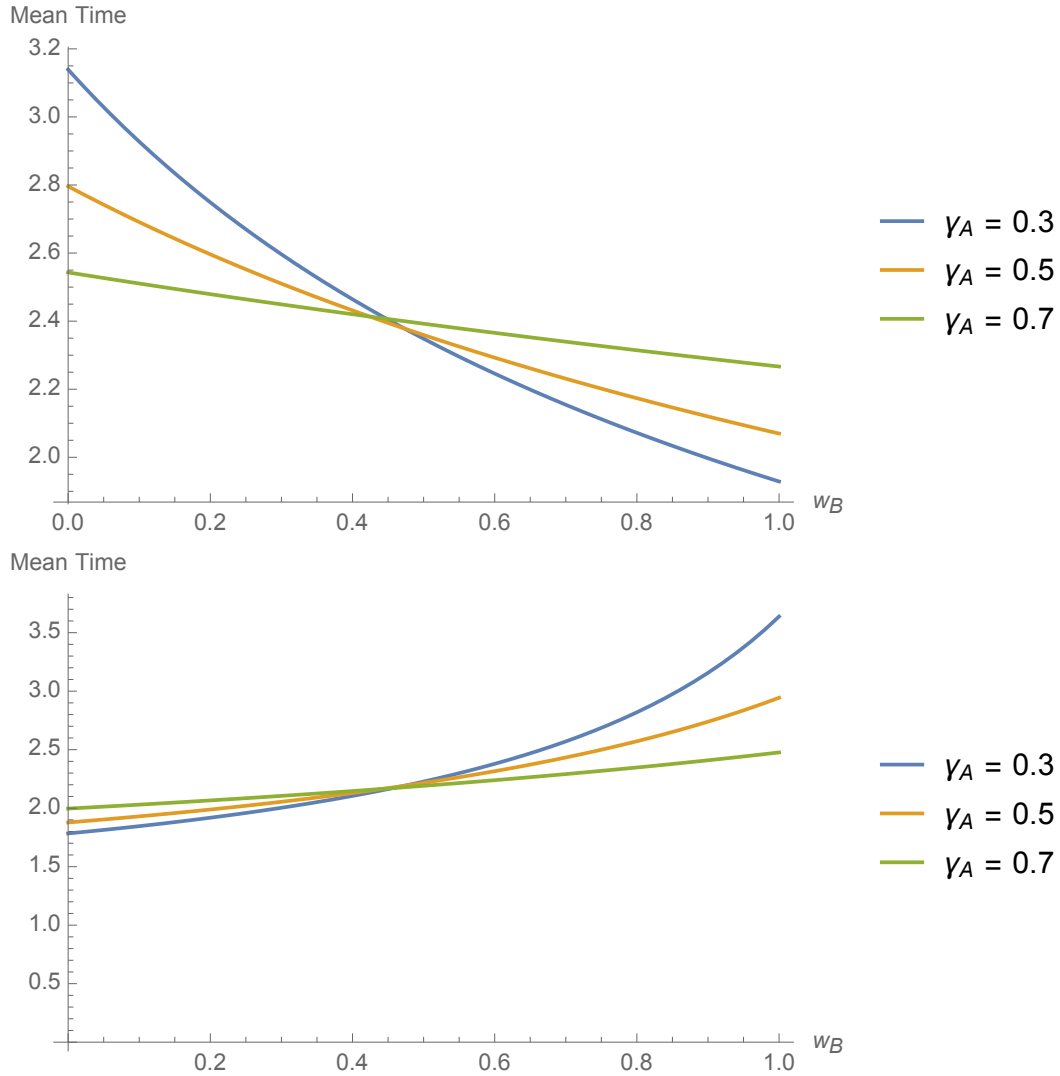
## 5.2 Sustaining Good Government

Consider the relationship between the electoral environment and good governance, which corresponds to states of the form  $(i, n, 1)$ . Figure 5 presents examples of the relationship between  $\gamma_A$  and the probability of good bureaucracy under different assumptions about polarization and the cost of hiring civil servants. The top panel presents the subcase of low polarization. Civil service hiring and hence good bureaucracy are obviously more likely when the cost of hiring civil servants for both parties are lower. More interestingly, when these costs are equal for both parties, the long-run probability of good bureaucracy is maximized when  $\gamma_A = 0.5$ . Under these conditions, then, electoral competition fosters good governance. The role of electoral competition in fostering good governance disappears when the two parties have asymmetric costs of hiring civil servants. In this case, good governance is enhanced in low polarization systems if the party with lower costs has an electoral advantage.

The bottom panel presents graphs under the same assumptions about costs, but in a high polarization environment. The long-run probability of good bureaucracy is now much lower under any assumptions about costs. There is no discernible impact of electoral competition when costs are the same for both parties, but good bureaucracy is again most likely when the party with lower costs has an electoral advantage.

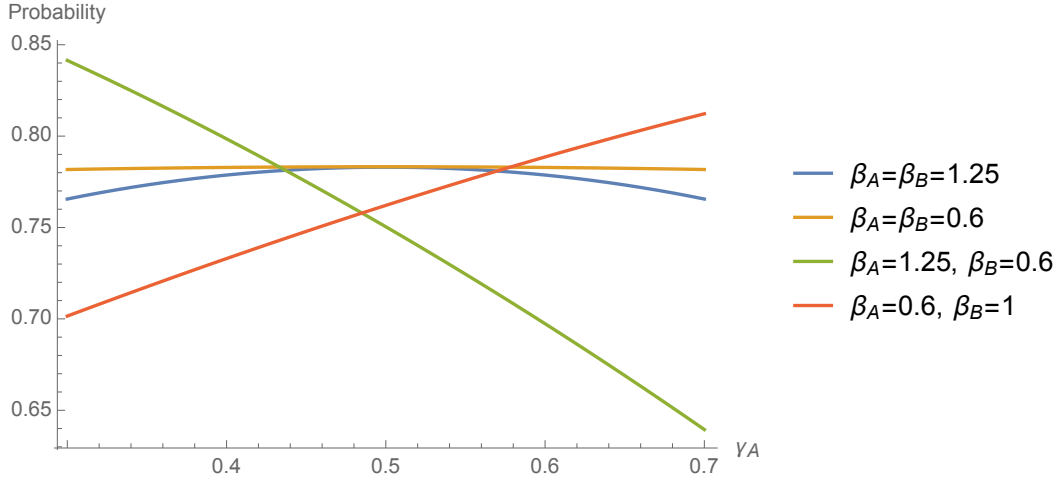
We next ask whether there are partisan differences in bureaucratic quality; that is, which party is more likely to govern with a good bureaucracy, conditional upon being in power? The answer is not easily deduced from each party's hiring decisions because of the delay between civil service hiring and the realization of good bureaucracies. Moreover, as Proposition 4 establishes, the relationship between civil service hiring and electoral prospects can go in

Figure 4: Persistence of Good and Bad Bureaucracy

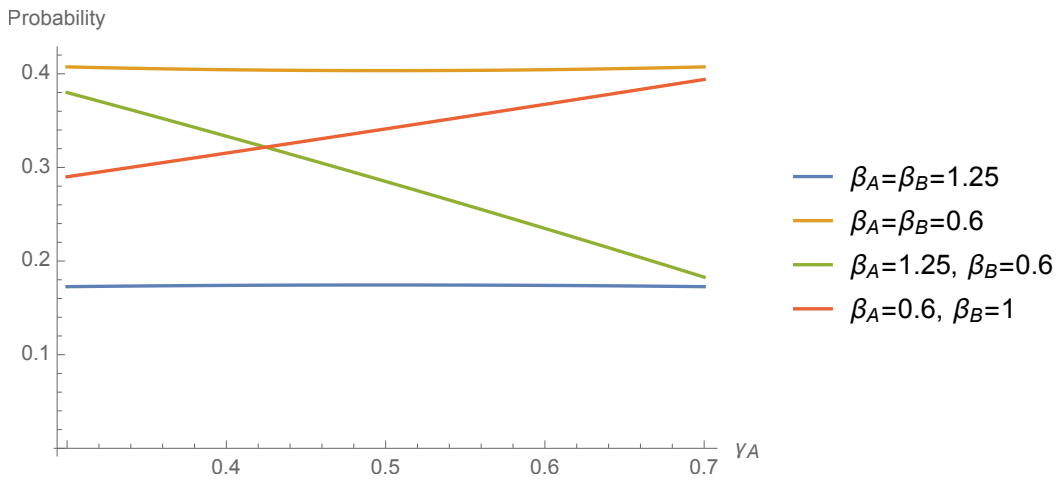


Note: Here  $m = 0.2$ ,  $k = 0.15$ ,  $w_A = 0.5$  and  $\beta_A = \beta_B = 1$ . The top panel shows the average number of periods before a government is good, starting from a bad government and a first term party A politician. The bottom panel shows the average number of periods before a government is bad, starting from a good government and a first term incumbent. Good government arrives more quickly and decays more slowly as public goods motivations become stronger, and as the more public goods-minded party gains an electoral advantage.

Figure 5: Electoral Competition and the Long-Run Probability of Good Bureaucracy



(a) Low party system polarization ( $w_A = w_B = .9$ )

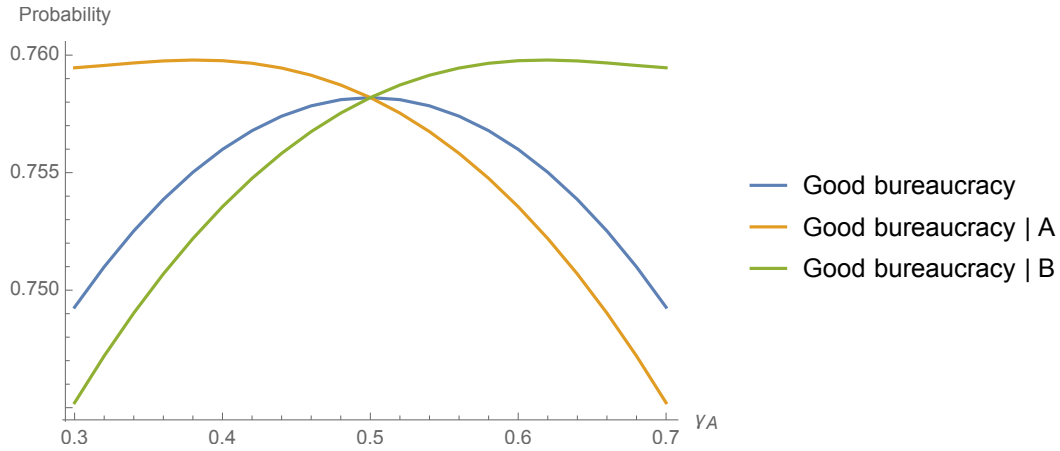


(b) High party system polarization ( $w_A = w_B = .1$ )

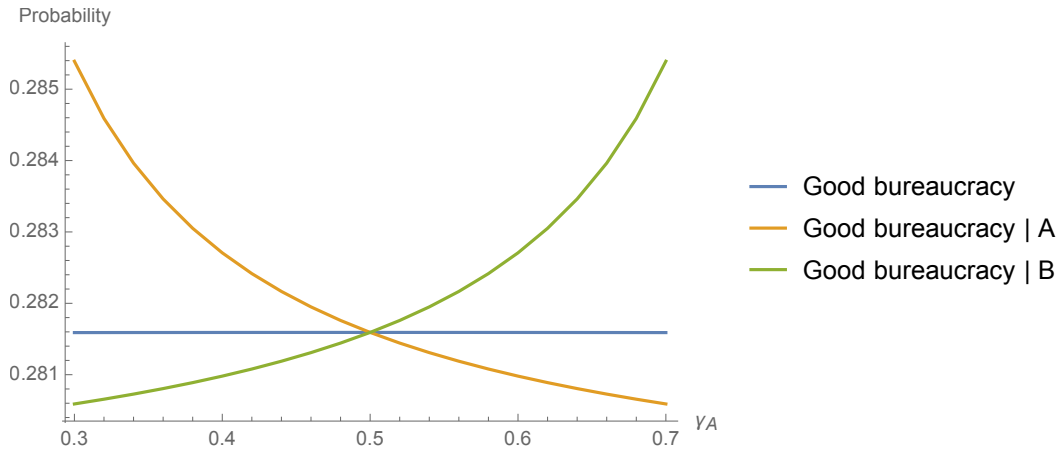
Note:  $m = 0.3$  and  $k = 0.1$  in both panels. In the top panel, the long-run probability of good bureaucracy is maximized when elections are competitive and costs are equal. In the bottom panel, political polarization removes the role of competitive elections. In both panels, the long-run probability of good bureaucracy is maximized when civil service hiring costs are low and there is an electoral advantage for the party with lower civil service hiring costs.

either direction. Figure 6 suggests that when parties have symmetric parameters, the electorally disadvantaged party will more often have a good bureaucracy, regardless of whether polarization is low or high.

Figure 6: Electoral Competition and Bureaucracy Quality by Party



(a) Low party system polarization ( $w_A = w_B = .9$ )



(b) High party system polarization ( $w_A = w_B = .1$ )

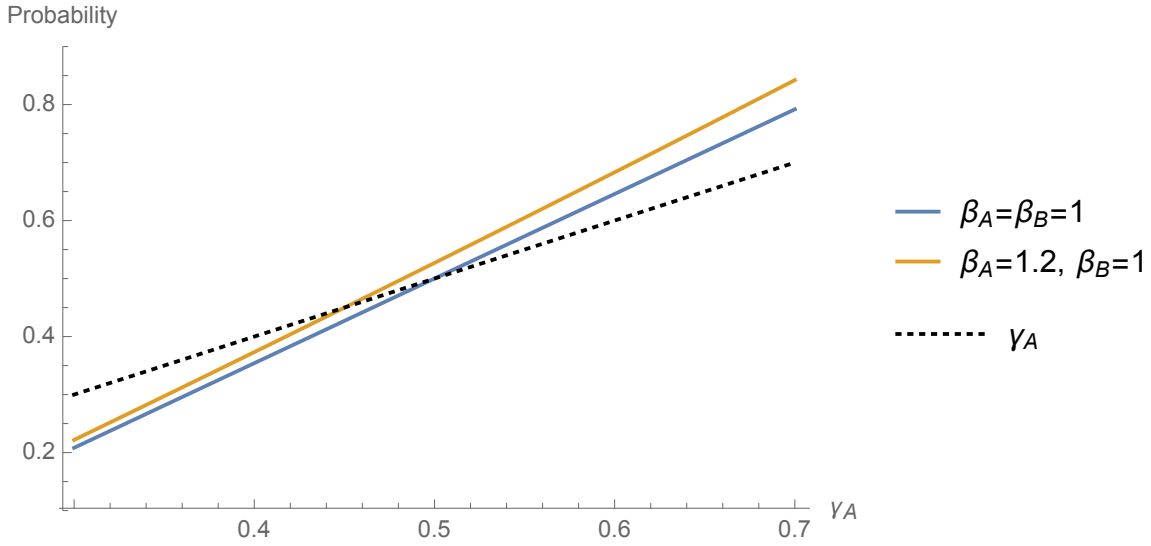
Note:  $m = 0.3$ ,  $\beta_A = \beta_B = 1$  and  $k = 0.1$  in both panels. Under both high and low polarization, the electorally disadvantaged party is more likely to be associated with good bureaucracy, conditional on being in power.

### 5.3 Personnel Policy and Electoral Advantage

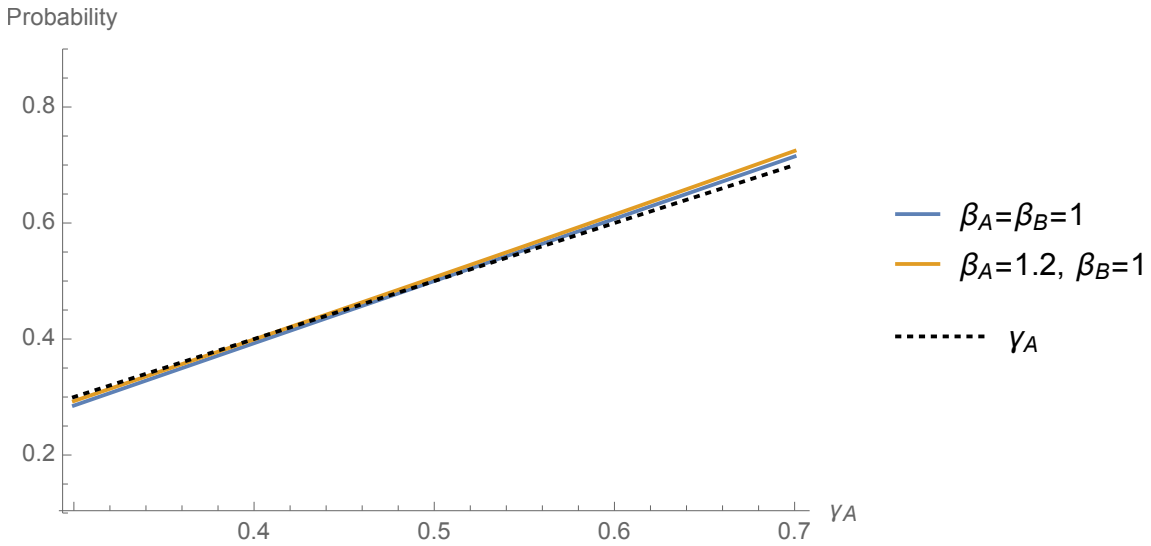
The discussion to this point has focused on how electoral politics shapes the long-run probability of good government. But we can also turn the question around. Personnel decisions by a party in power affect not only the nature of bureaucracy, but also the electoral prospects of each party. If one party has a greater incentive to invest in patronage, it can reap an electoral advantage. If a party does this when it has a built-in electoral advantage, the politics of bureaucracy will entrench advantaged parties. If a party does this when it suffers an electoral disadvantage, it will lessen this disadvantage. We can use the model to consider how the party system interacts with differential civil service costs to affect a long-run electoral advantage.

Figure 7 plots the long-run probability that  $A$  holds office (corresponding to the states of the form  $(A, n, q)$ ) against  $\gamma_A$ . When party system polarization is high and the costs of civil service hiring are equal, the effect of strategic personnel decision-making is to increase the electoral advantage of the favored party. This increase grows larger as the electoral advantage grows larger, further entrenching the party with the stronger electoral base. This is due to the relatively strong incentives for patronage politics when party systems are polarized. But consider what happens when hiring costs are not symmetric, for instance when  $A$  has higher costs of civil service than  $B$ . These higher costs of course encourage  $A$  to use more patronage than  $B$ , and thus increases the electoral advantage of  $A$  when  $A$  is favored and decreases the electoral advantage of  $B$  when  $B$  is favored (as one would expect given the cross-partials in Proposition 4). By comparison, when polarization is low, the same basic pattern exists. But the most striking feature of the figure is how muted these effects are. This suggests that the politics of personnel will entrench parties that have an electoral advantage, and that this will be particularly true when the favored party has relatively high costs of hiring civil servants. However, the extent to which it does so declines as party system polarization declines.

Figure 7: Electoral Competition and the Long-Run Probability that  $A$  is in Office



(a) High party system polarization ( $w_A = w_B = .1$ )



(b) Low party system polarization ( $w_A = w_B = .9$ )

Note:  $m = 0.3$  and  $k = 0.1$  in both panels. Personnel policies help to entrench the electorally advantaged party, especially under high polarization and high civil service hiring costs.

## 6 Empirical Implications of the Model

A central assumption in the model is that politicians can make civil service or patronage appointments in the bureaucracy, and that the more civil servants they hire, the greater the likelihood that good government will prevail in the future. This assumption undergirds our argument that politicians are most likely to emphasize civil service hiring when a particular type of party competition prevails, one where parties that are electoral foes mutually benefit from good government. The civil service should therefore be least developed when winning parties have incentives to narrowly target specific groups. This section explores empirically two questions related to this argument. First, are civil service hiring and good government related? Second, is civil service hiring least well-developed in countries where parties narrowly target specific groups for electoral support?

Answering these questions requires measures of good government and civil service, and to this end we rely on a recent data set by Dahlström, Teorell, Dahlberg, Hartmann, Lindberg and Nistotskaya (2015). The data set is based on a survey of experts in a wide range of countries that occurred in 2014-15. The experts were asked to place their bureaucracies on a 1-7 scale on a variety of different dimensions. In using the Dahlström et al. data, we have recoded all variables so that a larger number corresponds to better civil service or better government. The empirical appendix includes the text of the survey questions that we use in our analysis. Since our model focuses on democratic electoral competition, we will focus on countries that have maintained a *Polity2* score of 6 or higher (a standard threshold for coding countries as democratic) for at least five years.

*Measuring good government.* The theoretical model assumes that good government benefits all parties. We therefore need to consider dimensions of bureaucratic output that do not have a distributive bias. One dimension is bureaucratic efficiency. If bureaucrats exert little effort, fail to show up for work, or suffer limitations in their ability to get things done, everyone (except the bureaucrats) is worse off than they would be if bureaucrats provided



services efficiently. Another dimension is neutrality, or unbiasedness. If in providing public services, bureaucrats favor some groups over others, then citizens and the parties they support will not benefit equally from bureaucratic output. Finally, good government is *honest*. If bureaucrats extract bribes for providing services or embezzle funds from the state, citizens suffer. And if bribes target some groups of citizens over others, corruption also results in biased bureaucratic output.

Three different variables in the Dahlström et al. data can be used to measure bureaucratic efficiency. The first (q4\_e) is *Absenteeism*, which takes a higher value when workers do not skip work without permission. The second (q5\_k) is *Efficiency*, which taps the extent to which bureaucrats strive to be efficient. And the third (q5\_l) is *Helpful*, which takes a higher value when bureaucrats strive to be helpful.

There are two variables related to neutrality. *Group Bias* (q5\_f) takes a higher value when public sector workers are less likely to treat some groups in society differently than others. *Licensing Bias* (q5\_g) takes a higher value when public sector workers are less likely to base licensing decisions on personal contacts. Finally, to measure honesty, *Bribes* (q8\_c) takes a higher value when public sector worker are less likely to grant favors in exchange for money, while *Steals* (q8\_d) takes a higher value when public sector employees are less likely to steal or embezzle public monies.

The empirical appendix provides descriptive statistics for these good government variables, as well as the correlation matrix. Not surprisingly, the variables are strongly related to each other, with correlations ranging from .63 to .98 among the democracies in our data.

*Measuring civil service.* How might we measure whether hiring practices are oriented more towards civil service versus patronage? Scholars often emphasize the institutional structures for hiring bureaucrats, and in particular whether there exists a formal exam for hiring bureaucrats (which can limit opportunities to make patronage appointments). This approach is central to Rauch and Evans (2000), who regard the presence of such an exam as an important element of Weberian civil service. *Exam* (q2\_d) allows us to measure the

importance of merit based exams in hiring, taking a higher value when some form of exam is central to hiring decisions.

There are a number of reasons to expect that merit exams might be only weakly related to civil service. Modern personnel system often hire talented individuals using criteria other than uniform exams, and there are many strategies politicians use to subvert the intended effects of institutions like merit exams (e.g., Grindle 2012). Thus, we can use a less institutional and more impressionistic approach to measuring civil service: *Merit Selection* (q2.a) takes a higher value when experts believe that obtaining a job in the bureaucracy depends most heavily on skills and merit. It is interesting to note that the two measures are positively related, but that the correlation is not particularly strong ( $r = .41$ ), making it worthwhile to examine which has a stronger relationship with good government.

To this end, we regress each governance quality measure on a set of controls, and on either *Merit Selection* or *Exam*. The controls include the log of GDP/capita (*GDP*), the level of democracy (measured using *Polity2*), ethnic polarization (*EP*),<sup>5</sup> an indicator variable for presidential systems (*Presidential*), an indicator variable for proportional representation (*PR*), the number of years that the county has been democratic (*Age Democratic*) and regional indicator variables. Table 1 presents the results from these regressions for the two measures of civil service. For example, when we regress *Absenteeism* on *Merit Selection* and the controls, the coefficient on *Merit Selection* is .31 with a standard error of .11.

The regressions that include *Merit Selection* as the measure of civil service hiring show a strong, precisely estimated coefficient between this variable and each measure of good government. The size of the coefficients suggest that a one-unit increase in *Merit Selection* on the 7-point scale is often associated with more than a one-half unit increase in the good government measure. And all coefficients are estimated with standard errors that yield a  $p$ -value of less than .01. By contrast, the regressions using *Exam* show that this variable has

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<sup>5</sup>*EP* takes a higher value as society becomes divided into two equally-sized ethnolinguistic groups (see Reynal-Querol 2002). This variable is more closely related to polarization in our model than is the widely used alternative, ethnolinguistic fractionalization (*ELF*).

Table 1: Civil Service and Good Government

Measure of civil service	<i>Dependent variable: Measure of good government</i>						
	Absenteeism	Efficiency	Helpful	Group Bias	Licensing Bias	Bribes	Steals
Merit Selection	.31*** (.11)	.58*** (.09)	.53*** (.10)	.43*** (.12)	.79*** (.14)	.66*** (.13)	.64*** (.12)
Exam	-.03 (.09)	.06 (.09)	.05 (.08)	.13 (.08)	.09 (.10)	.04 (.10)	.05 (.10)

*Note.* Each cell presents the coefficients from OLS model where the dependent variable is the measure of good government listed at the top of each column and the measure of civil service is listed in the left-most column. All models also include a number of (unreported) controls which are described in the text. Robust standard errors are in parentheses. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

a tiny and very imprecisely estimated coefficient for each measure of good government. In short, the association between *Merit Selection* and good government is strong and robust but the association between *Exam* and good government is not.

These results are informative for two reasons. First, a key feature of our model is that the current majority can undo civil service hiring procedures adopted by the previous government. They may do this by adopting new laws or by simply circumventing the intent of existing procedures. That the associations are stronger for *Merit Selection* than for *Exam* is consistent with the idea that institutional lock-in of civil service hiring is difficult, and that elected majorities can circumvent the intention of civil service rules meant to tie their hands. Second, the results have implications for how one should test the relationship between the electoral context and hiring strategies. In particular, we should expect variables that encourage civil service appointments to be related to measures of civil service hiring that are actually associated with good government. Thus, Table 1 strongly suggests that the theoretical model's implications for civil service hiring strategies need to be tested using variables like *Merit Selection* rather than variables like *Exam*.

We now explore the link between the electoral context and civil service hiring. In the model,  $w$  is the degree to which parties prefer public goods versus private or pork barrel goods. When  $w$  is small it is very difficult to sustain hiring practices that encourage good

government. While a range of factors can plausibly affect party preferences, one reasonable proxy for a party system with low  $w$  is one where parties have strong and distinct ethnic bases of support. When parties rely on different ethnic groups for votes, incumbents have incentives to serve the narrow interests of the ethnic groups they represent, and also to give them public sector jobs. Thus, we should expect institutions and practices related to good government to be negatively correlated with the ethnic basis of support for parties.

We use “Party Voting Polarization” (*PVP*) to measure the ethnic basis of support for parties in a country. Given the two-party assumption of the theoretical model, *PVP* is particularly appropriate because it increases (a) when political parties tend to have distinctive bases of support, and (b) when the party system moves toward two main parties (which is a function of the polarization assumption of the measure). Details of the variable’s construction are found in the empirical appendix and in Huber (2012). The data are taken from Huber (2012), supplemented by additional observations from the World Values Survey. There are 74 observations from 42 countries. The surveys are from 1992-2008, prior to the date of the 2014 civil service survey – at times substantially so – a point we return to below.

Figure 8 shows the scatterplot of the bivariate relationship between *PVP* and *Merit selection*. The expected negative relationship clearly exists, though it is modest in size ( $r = -.21$ ). It does not seem driven by any particular outliers. For comparison, the right panel shows the scatterplot between *PVP* and *Exam*. The correlation is positive – the wrong direction – but extremely weak ( $r = .11$ ).

Table 2 presents the results of OLS estimations. All models contain *EP* as a control variable to ensure that any result are capturing voting behavior, not underlying distributions of ethnic groups. We also include the controls discussed above, as well as regional fixed effects (which are not reported in the table). Models 1-3 include each country-year observation for which we have *PVP* data, and thus include data as far back as 1992, and include multiple observations for some countries. The models estimate robust standard errors, clustered by country, and also include (unreported) year indicator variables.



for some countries than others (while our measure of civil service is a constant for each country) are mitigated to some extent by the fact that the models include year indicators and estimate robust standard errors clustered by country. It is nonetheless useful to explore whether the results are robust when we use only one observation per country. To this end, we create the variable  $\overline{PVP}_{All}$ , which is the country mean of  $PVP$  using all available data. We then estimate the model with robust standard errors using data from 2008 (the last year for which we have  $PVP$  data). While this approach has the disadvantage that one must choose an arbitrary year for the cross-section, it has the advantage of assuring us that any results are not due to overweighting countries that happen to have more surveys. Model 4 provides the results when all controls are included, and model 5 re-estimates model 4 but omitting those control variables in model 4 that have no clear relationship with *Merit Selection*. In both models, the coefficient on  $\overline{PVP}_{All}$  remains negative and very precisely estimated.

Finally, to bring the date of the  $PVP$  surveys closer to the date of *Merit Selection*, we create  $\overline{PVP}_{>2000}$ , which is the country mean of  $PVP$  using only data from 2000 or later. Model 6 includes the full set of controls and model 7 excludes imprecisely measured controls. In both models, the coefficient for  $\overline{PVP}_{>2000}$  is negative and precisely estimated. We also regressed *Exam* on each of the three measures of  $PVP$  (and controls) and in each model (not reported here) the coefficient for  $PVP$  was estimated with very large error.

The analysis therefore provides evidence of a robust negative association between contexts that encourage narrow, group-based politics and merit-based hiring. There is no evidence that the electoral context is related to exams, which are not strongly associated with good government. And there is no negative correlation between ethnic diversity itself – measured by ethnic polarization – and civil service hiring: only when this diversity is reflected in electoral competition do we see this relationship.

Table 2: OLS models of party system ethnification and civil service hiring

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ethnic Polarization	0.962 (0.866)	1.724* (0.962)	1.406 (0.919)	0.868 (0.926)	0.549 (0.740)	0.271 (0.921)	0.166 (0.775)
PVP		-4.342*** (1.596)	-5.210*** (1.546)				
$\overline{PVP}_{All}$				-4.603*** (1.660)	-4.530*** (1.563)		
$\overline{PVP}_{>2000}$						-3.440** (1.539)	-3.379** (1.440)
Age democratic	0.010 (0.006)	0.012** (0.006)	0.012** (0.005)	0.007 (0.005)	0.008 (0.005)	0.010 (0.006)	0.012** (0.006)
Presidential	-0.367 (0.381)	-0.314 (0.316)		-0.196 (0.404)		-0.326 (0.384)	
PR	0.077 (0.436)	-0.011 (0.421)		-0.377 (0.295)	-0.305 (0.258)	-0.282 (0.316)	
GDP/capita(log)	0.018 (0.165)	-0.054 (0.149)		0.025 (0.190)		-0.054 (0.246)	
Polity2	0.197 (0.131)	0.169 (0.141)		0.110 (0.191)		-0.035 (0.214)	
Constant	2.098 (1.600)	3.052* (1.731)	4.303*** (0.675)	3.935* (2.201)	5.290*** (0.527)	5.977** (2.614)	4.777*** (0.703)
R-squared	0.673	0.705	0.686	0.648	0.642	0.687	0.672
N	74	74	74	41	42	33	33

*Note.* OLS models with standard errors in parentheses. The dependent variable is *Meritselection*. All models include (unreported) regional indicator variables. Models 1-3 also include year indicator variables, and these models estimate robust standard errors clustered by country. Models 4-7 are estimated for the year 2008 and these models estimate robust standard errors. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

## 7 Conclusions

In recent years, there has been growing interest in both the adoption of civil service reforms and the somewhat elusive concept of state capacity. To our knowledge, no theoretical work has yet considered the combination of these features in a framework that allows the examination of their long-run viability. Our theory of personnel policy attempts to do so by modeling competing political parties over an infinite horizon. Its main features include the differentiation between types of bureaucratic personnel, a bureaucratic production function that affects election outcomes, and relationships between civil service appointments, the quality of bureaucracy and public goods production.

The model brings into sharp relief the deep challenges associated with creating good government, which is not something that can be imposed by one party on another, but rather emerges from the mutual interest of competing political parties. Given that cooperation over time sustains good government, a party's civil service hiring will be influenced not simply by its own preferences, but also by characteristics of the opposition. Expectations about electoral outcomes are also important. When the other party is moderate and can hire civil servants inexpensively, civil service hiring is increasing in electoral vulnerability, reflecting an insurance motive. When this is not true, such hiring is an investment and is therefore decreasing in electoral vulnerability. The model therefore raises questions about both the generality and the mechanisms of "lock-in" arguments. Over the long-run, sustaining good government is enhanced by electoral competition only when party system polarization is low and the costs of civil service hiring are the same for each party. When these conditions are not met, good governance is maximized when the advantaged party has lower costs and less extreme preferences. And electoral incentives associated with personnel policies will entrench favored parties when these parties have non-centrist preferences.

The analysis suggests several avenues for further research. With respect to the theoretical model, a difficult but useful extension would be to eliminate the exogenous constraint on the



size of the bureaucracy. This would produce predictions about not only the composition of government, but its size as well. In addition, by including longer time horizons and electoral constituencies for public goods, the model might shed light on the apparent permanence of reforms in some countries. More broadly, we believe that the model can serve as a useful framework for modeling public good investments under electoral competition.

With respect to empirical applications, we have presented evidence using ethnic voting to describe the link between the nature of electoral competition and civil service hiring. It is important to consider other ways in which party competition shapes party preferences, and to examine how such elements of party preferences interact with electoral vulnerability to influence hiring practices. We have also presented evidence that descriptions of institutional features of bureaucracy – such as the existence of hiring exams – are inadequate proxies for civil service. It is important, however, to consider alternatives to experts surveys for measuring attributes of bureaucratic personnel. Information about bureaucrats themselves could be very useful in this regard. The model also underlines the importance of thinking about factors that affect the differential costs of civil service investment across parties. Such factors may be linked to things like ethnicity if particular ethnic groups are routinely excluded from civil service positions and ethnic identity is related to vote choice.

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## THEORETICAL APPENDIX

**Proof of Proposition 1.** Let  $\Omega_i$  denote a party  $i$  first-term incumbent's conjectured payoff from a subsequent period in which she is not re-elected and the bureaucracy is good, where in equilibrium  $\Omega_i = u_i(c_j^{11}, 1)$ . Additionally, let  $c_i^{1q}(\Omega_i)$  denote the optimal level of civil service hiring for a newly elected party  $i$  politician, given  $\Omega_i$ . Differentiating the objective (3) with respect to  $c$  produces:

$$\begin{aligned} \frac{dEU_i(c|s)}{dc} = & ((1-q)m(1-2c) + \gamma_i) [u_i(c_j^{10}, 0) - \Omega_i - u_i(c_i^{20}, 0) + u_i(c_i^{21}, 1)] - u_i(c_j^{10}, 0) + \\ & \Omega_i + (1-q)m(u_i(c_j^{10}, 0) - u_i(c_i^{20}, 0) - k) - 2\beta_i + (1+q)w_i - 4c + 3. \end{aligned} \quad (10)$$

Substituting in expressions (5)-(7) into (10) and solving this first order conditions yields the following solutions for  $c_i^{10}(\Omega_i)$  and  $c_i^{11}(\Omega_i)$ :

$$c_i^{10}(\Omega_i) = \frac{1}{2} + \frac{3w_i^2\gamma_i - m(8k + w_i^2 + (1 - 2\beta_i)^2 - 2w_i(1 + 2\beta_i)) + w_i(8 + (6 - 4\beta_i)\gamma_i) + 8(1 - 2\beta_i + (1 - \gamma_i)\Omega_i)}{32 + 2m(3w_i^2 + w_i(6 - 4\beta_i) - 8\Omega_i)}, \quad (11)$$

$$c_i^{11}(\Omega_i) = \frac{1}{2} + \frac{3w_i^2\gamma_i + w_i(16 + (6 - 4\beta_i)\gamma_i) + 8(1 - 2\beta_i + (1 - \gamma_i)\Omega_i)}{32}. \quad (12)$$

Expressions (11) and (12) are identical to (8) and (9) in the proposition, respectively, so it only remains to solve for  $\Omega_i$ . Using the definition of  $\Omega_i$ , we have the following relationships:

$$\Omega_i = u_i(c_j^{11}(\Omega_j), 1)$$

$$\Omega_j = u_j(c_i^{11}(\Omega_i), 1).$$

Solving for  $\Omega_i$  yields:

$$\Omega_i = \frac{w_i(96 - 64\beta_j + 12w_j^2(1 - \gamma_i) + w_j(88 - 16\beta_j(1 - \gamma_i) - 16\beta_i\gamma_i + 3w_i^2\gamma_i^2 + 2w_i\gamma_i(8 + 3\gamma_i - 2\beta_i\gamma_i)))}{(8(16 - w_iw_j(1 - \gamma_i)\gamma_i))}.$$

We next verify that the objective is concave. Substituting from (5)-(7) into (3), the second order condition is:

$$\frac{m}{4}(8\Omega_i + w_i(4\beta_i - 3w_i - 6)) - 4.$$

By the bounds on the stage game payoffs,  $\Omega_i < 1$ , and thus this expression is negative. ■

**Proof of Comment 1.** We show that  $c_i^{1q}$  is increasing in  $w_i$ . The results for  $\beta_i$  are derived identically and are therefore omitted.

First consider when a party  $i$  politician inherits a bad bureaucracy. Let  $G(c) = \frac{dEU_i(c|s)}{dc}$  be her first order condition, as given by equation (10). By the implicit function theorem, at a maximum,  $\frac{\partial c_i^{10}}{\partial x} = -\frac{\frac{\partial G}{\partial x}}{\frac{\partial G}{\partial c}}$  for any exogenous parameter  $x$ . Since  $\frac{\partial G}{\partial c} < 0$  (this is the second order condition, established in the proof of Proposition 1),  $\text{sign} \frac{\partial c_i^{10}}{\partial x} = \text{sign} \frac{\partial G}{\partial x}(c_i^{10})$ . Evaluating  $\frac{\partial G}{\partial w_i}(c_i^{10})$  produces:

$$\frac{\partial G}{\partial w_i} = \frac{2\alpha_i - (2c_A^{10}m - \gamma_i)(3w_i + 2\alpha_i - 1) + 2\beta_i + 2m(w_i + \alpha_i + \beta_i)}{2(\alpha_i + \beta_i)}.$$

Given  $\alpha_i + \beta_i = 2$ , this partial derivative is positive if  $z = 4 + 2c_i^{10}m - (3w_i + 2\alpha_i)(2c_i^{10}m - \gamma_i) + 2m(w_i + 2) - \gamma_i > 0$ . Since  $z$  is linear in  $m$  and  $m$  is bounded by 0 and  $\gamma_i$ , it is sufficient to check that  $z$  positive at these bounds. At  $m = 0$ ,  $z = 4 - \gamma_i + (3w_i + 2\alpha_i)\gamma_i > 0$ . At  $m = \gamma_i$ ,  $z = 4 + (3 + 5w_i + c_i^{10}(2 - 6w_i - 4\alpha_i) + 2\alpha_i)\gamma_i > 0$  for all possible  $c_i^{10} \in [0, 1]$ .

Next consider when a party  $i$  politician inherits a good bureaucracy. Evaluating the derivative of  $c_i^{11}$  directly produces:

$$\frac{\partial c_i^{11}}{\partial w_i} = \frac{12w_j^2(1 - \gamma_i)^2 + 32(7 + 2\alpha_j(1 - \gamma_i) + 3w_i\gamma_i + 2\alpha_i\gamma_i) - w_j(1 - \gamma_i)(3w_i^2\gamma_i^2 - 16\alpha_j(1 - \gamma_i) - 16\alpha\gamma_i - 56)}{2(16 - w_iw_j(1 - \gamma_i)\gamma_i)^2}.$$

Each term in this expression is positive, and thus  $\frac{\partial c_i^{11}}{\partial w_i} > 0$ . ■

**Proof of Proposition 2.** We first establish the result for  $\frac{\partial c_A^{10}}{\partial w_B}$ . Let  $G(c) = \frac{dEU_A(c|s)}{dc}$  be  $A$ 's first order condition, as given by equation (10). Following the implicit function theorem argument in the proof of Comment 1, we show that  $\frac{\partial G}{\partial w_B}(c_A^{10}) > 0$ . Since  $G(c)$  depends on  $\Omega_A$  (i.e., the value to  $A$  of the public goods produced by  $B$  if  $B$  wins and the bureaucracy is good, as defined in the proof of Proposition 1) and  $\Omega_A$  depends on  $w_B$ , we have  $\frac{\partial G}{\partial w_B}(c_A^{10}) = \frac{\partial G}{\partial w_B} + \frac{\partial G}{\partial \Omega_A} \frac{\partial \Omega_A}{\partial w_B}$ . Evaluating each component gives:

$$\begin{aligned} \frac{\partial G}{\partial w_B} &= 0 \\ \frac{\partial G}{\partial \Omega_A} &= 1 + (2c_A^{10} - 1)m - \gamma_A \\ \frac{\partial \Omega_A}{\partial w_B} &= \frac{w_A(96w_B(1 - \gamma_A) - 3w_Aw_B^2(1 - \gamma_A)^2\gamma_A + 4(3w_A^2\gamma_A^2 + 4\alpha_B(1 - \gamma_A)(4 + w_A\gamma_A) + 8(7 + 2\alpha_A\gamma_A) + 2w_A\gamma_A(7 + 2\alpha_A\gamma_A)))}{2(16 - w_Aw_B(1 - \gamma_A)\gamma_A)^2}. \end{aligned}$$

Noting that  $\frac{\partial G}{\partial \Omega_A} > 0$  by our assumptions on  $m$  and  $\gamma_i$ , these expressions imply that  $\text{sign} \frac{\partial c_A^{10}}{\partial w_B} = \text{sign} \frac{\partial \Omega_A}{\partial w_B}$ . This derivative is clearly positive given that  $96w_B(1 - \gamma_A) - 3w_Aw_B^2(1 - \gamma_A)^2\gamma_A > 0$  and all other terms are positive.

For  $\frac{\partial c_A^{10}}{\partial \beta_B}$ , we perform the analogous exercise. Since  $\frac{\partial G}{\partial \beta_B} = 0$ , we have  $\text{sign} \frac{\partial c_A^{10}}{\partial \beta_B} = \text{sign} \frac{\partial \Omega_A}{\partial \beta_B}$ , which evaluates to  $\frac{2w_A(\gamma_A - 5)}{16 - w_A(1 - \gamma_A)\gamma_A} < 0$ .

For  $c_A^{11}$ , by analogous arguments,  $\text{sign} \frac{\partial c_A^{11}}{\partial w_B} = \text{sign} \frac{\partial \Omega_A}{\partial w_B}$ , which we have shown is positive, and  $\text{sign} \frac{\partial c_A^{11}}{\partial \beta_B} = \text{sign} \frac{\partial \Omega_A}{\partial \beta_B}$ , which we have shown is negative. This establishes the result. ■

**Proof of Proposition 3.** For both levels of bureaucratic quality, Comment 1 shows that party  $A$ 's civil service hiring is increasing in  $w_A$ , and Proposition 2 shows that it is increasing in  $w_B$ . Thus, civil service hiring is increasing in  $w = w_A = w_B$ . ■

**Proof of Proposition 4.** It can easily be shown (see Figure 1, for example) that there exist cases where  $\frac{\partial c_A^{1q}}{\partial \gamma_A} > 0$  and  $\frac{\partial c_A^{1q}}{\partial \gamma_A} < 0$ .

Throughout, let  $G(c) = \frac{dEU_A(c|s)}{dc}$  be  $A$ 's first order condition, as given by equation (10), and let  $\Omega_A$  denote the value to  $A$  of the public goods produced by  $B$  if  $B$  wins and the



bureaucracy is good, as defined in the proof of Proposition 1.

(i) We characterize conditions under which  $\frac{\partial c_A^{10}}{\partial \gamma_A} > (<) 0$  for  $w_B$  sufficiently small (large).

Using the implicit function theorem, it is straightforward to show that  $\frac{\partial c_A^{10}}{\partial \gamma_A} > (<) 0$  iff  $\frac{\partial G}{\partial \gamma_A}(c_A^{10}) > (<) 0$ . Taking the total derivative, we have  $\frac{\partial G}{\partial \gamma_A}(c_A^{10}) = \frac{\partial G}{\partial \gamma_A} + \frac{\partial G}{\partial \Omega_A} \frac{\partial \Omega_A}{\partial \gamma_A}$ . Evaluating each component gives:

$$\begin{aligned} \frac{\partial G}{\partial \gamma_A} &= \frac{3w_A^2 + w_A(6 - 4\beta_A)}{16} - \Omega_A \\ \frac{\partial G}{\partial \Omega_A} &= 1 + (2c_A^{10} - 1)m - \gamma_A \\ \frac{\partial \Omega_A}{\partial \gamma_A} &= \frac{w_A w_B [3\gamma_A^2 w_A^3 w_B - 2\gamma_A w^2 ((2\beta_A - 11)\gamma_A w_B + 48) + 64(4\beta_A - 4\beta_B + 3w_B) - 4w_A [32\gamma_A(\beta_B - \beta_A) - 16\beta_B + 88 + 3(1 - \gamma_A)^2 w_B^2 + w_B(4\beta_A \gamma_A^2 - 4\beta_B(1 - \gamma_A)^2 - 44\gamma_A + 22)]]}{8(16 - (1 - \gamma_A)\gamma_A w_A w_B)^2}. \end{aligned}$$

We next provide two bounds on  $\frac{\partial G}{\partial \gamma_A}(c_A^{10})$ , and show that these bounds are decreasing in  $w_B$ . From the expressions above it is clear that  $\frac{\partial G}{\partial \gamma_A}(c_A^{10})$  is linear in  $\mu = (-1 + 2c_A^{10})m$ , and hence  $\frac{\partial^2 G}{\partial \gamma_A \partial w_B}(c_A^{10})$  is also linear in  $\mu$ . Since  $\gamma_A + \gamma_B = 1$ ,  $\mu$  is bounded by  $\max\{-\gamma_A, \gamma_A - 1\}$  and  $\min\{\gamma_A, 1 - \gamma_A\}$ . Abusing notation slightly, we verify that  $\left. \frac{\partial^2 G}{\partial \gamma_A \partial w_B} \right|_{\mu=\gamma_A-1} < 0$  and  $\left. \frac{\partial^2 G}{\partial \gamma_A \partial w_B} \right|_{\mu=\gamma_A} < 0$ , and therefore  $\frac{\partial G}{\partial \gamma_A}(c_A^{10})$  must be bounded from above and below by two functions that are decreasing in  $w_B$ .

$\left. \frac{\partial^2 G}{\partial \gamma_A \partial w_B} \right|_{\mu=\gamma_A-1}$  has a positive denominator and is therefore negative if it has a negative numerator. This condition reduces to:

$$\begin{aligned} &96w_B(1 - \gamma_A) - 3w_A w_B^2(1 - \gamma_A)^2 \gamma_A \\ &+ 4(3w_A^2 \gamma_A^2 + 4\alpha_B(1 - \gamma_A)(4 + w_A \gamma_A) + 8(7 + 2\alpha_A \gamma_A) + 2w_A \gamma_A(7 + 2\alpha_A \gamma_A)) > 0. \end{aligned}$$

This must be true given that  $96w_B(1 - \gamma_A) - 3w_A w_B^2(1 - \gamma_A)^2 \gamma_A > 0$  and each term in the second line of the expression is positive.

Next,  $\left. \frac{\partial^2 G}{\partial \gamma_A \partial w_B} \right|_{\mu=\gamma_A}$  has a positive denominator and is therefore negative if it has a negative

numerator. This condition reduces to:

$$\begin{aligned}
& -(16 + w_A w_B (-1 + \gamma_A) \gamma_A)^2 (24 w_B (1 - \gamma_A) + 16 \alpha_B (1 - \gamma_A) + \\
& \quad 3 w_A^2 \gamma_A^2 + 8(7 + 2 \alpha_A \gamma_A) + 2 w_A \gamma_A (8 - (1 - 2 \alpha_A) \gamma_A)) \\
& - w_B (16 - w_A w_B (1 - \gamma_A) \gamma_A) (192 + 3 w_A^3 \gamma_A^2 + 2 w_A^2 (7 + 2 \alpha_A) \gamma_A^2 - 8 w_A (7 + 3 w_B (1 - \gamma_A)^2 + \\
& \quad 2 \alpha_B (1 - \gamma_A)^2 - 14 \gamma_A - 2 \alpha_A \gamma_A^2)) \\
& - w_A (1 - \gamma_A) \gamma_A (16 - w_A w_B (1 - \gamma_A) \gamma_A) [64 \alpha_B + 12 w_B^2 (1 - \gamma_A) - 32 + \\
& \quad w_B (16 \alpha_B (1 - \gamma_A) + 3 w_A^2 \gamma_A^2 + 8(7 + 2 \alpha_A \gamma_A) + 2 w_A \gamma_A (8 - \gamma_A + 2 \alpha_A \gamma_A))] + \\
& (-16 - w_A w_B (1 - \gamma_A) \gamma_A) (64(3 w_B - 4 \alpha_A + 4 \alpha_B) + 3 w_A^3 w_B \gamma_A^2 + 2 w_A^2 \gamma_A (w_B (7 + 2 \alpha_A) \gamma_A - 48) - \\
& \quad 4 w_A (3 w_B^2 (1 - \gamma_A)^2 + 8(7 + \alpha_B (2 - 4 \gamma_A) + 4 \alpha_A \gamma_A) + 2 w_B (7 + 2 \alpha_B (1 - \gamma_A)^2 - 14 \gamma_A - 2 \alpha_A \gamma_A^2))) < 0
\end{aligned}$$

Of the four terms in this expression, only the last can be positive. The sum of the first and last term is linear in  $\alpha_B$ , and thus the entire expression is negative if this sum is negative at  $\alpha_B = 0$  and at  $\alpha_B = 3/2$ , which is true for all possible parameter values.

These bounds imply that  $\frac{\partial G}{\partial \gamma_A}(c_A^{10}) > 0$  for  $w_B$  sufficiently low, and  $\frac{\partial G}{\partial \gamma_A}(c_A^{10}) < 0$  for  $w_B$  sufficiently high. Define the functions  $\overline{G} : \mathbb{R} \rightarrow \mathbb{R}$  and  $\underline{G} : \mathbb{R} \rightarrow \mathbb{R}$ , where  $\overline{G}(w_B) = \frac{\partial G}{\partial \gamma_A}$ , evaluated at  $\mu = \gamma_A$  and arbitrary values of  $w_B$ , and  $\underline{G}(w_B) = \frac{\partial G}{\partial \gamma_A}$  evaluated at  $\mu = \gamma_A - 1$ , and arbitrary values of  $w_B$ . By the preceding derivation, both of these functions are decreasing in  $w_B$ . Define  $\overline{w}_B^*$  and  $\underline{w}_B^*$  as follows:

$$\begin{aligned}
\underline{w}_B^* &= \begin{cases} 0 & \text{if } \min\{\overline{G}(0), \underline{G}(0)\} < 0 \\ w_B & \text{if } \min\{\overline{G}(w_B), \underline{G}(w_B)\} = 0 \text{ and } w_B \in (0, 1) \\ 1 & \text{if } \min\{\overline{G}(1), \underline{G}(1)\} > 0. \end{cases} \\
\overline{w}_B^* &= \begin{cases} 0 & \text{if } \max\{\overline{G}(0), \underline{G}(0)\} < 0 \\ w_B & \text{if } \max\{\overline{G}(w_B), \underline{G}(w_B)\} = 0 \text{ and } w_B \in (0, 1) \\ 1 & \text{if } \max\{\overline{G}(1), \underline{G}(1)\} > 0. \end{cases}
\end{aligned}$$

Thus,  $\frac{\partial G}{\partial \gamma_A}(c_A^{10}) > 0$  if  $w_B < \underline{w}_B^*$ , and  $\frac{\partial G}{\partial \gamma_A}(c_A^{10}) < 0$  if  $w_B > \overline{w}_B^*$ . The comparative statics result for  $\frac{\partial c_A^{10}}{\partial \gamma_A}$  follows from the implicit function theorem.

(ii) To prove the result for  $\beta_B$ , we differentiate  $\frac{\partial G}{\partial \gamma_A}(c_A^{10})$  with respect to  $\beta_B$ , yielding:

$$\frac{2w_A((1-\gamma_A)^2w_Aw_B^2((2c_A^{10}-1)m+1)-4w_B((2c_A^{10}-1)m((2\gamma_A-1)w_A+4)+(1-\gamma_A)((\gamma_A-1)w_A+8))-64)}{(16-(1-\gamma_A)\gamma_Aw_Aw_B)^2}$$

Since the denominator is clearly positive,  $\frac{\partial G}{\partial \gamma_A}(c_A^{10})$  is increasing in  $\beta_B$  if the numerator is negative. To verify this, we define  $\mu = (2c_A^{10} - 1)m$  and substitute this into the numerator, noting that  $\mu$  is bounded between  $-1$  and  $1$ . Then taking the derivative of the numerator with respect to  $\mu$  yields  $2w_Aw_B(w_A((1-\gamma_A)^2w_B - 8\gamma_A + 4) - 16)$ . This expression is negative, and thus the numerator is maximized at  $\mu = -1$ . Substituting this into the numerator produces an upper bound of  $8w_A(w_B(8\gamma_A + \gamma_A^2w_A - 4) - 16)$ , and thus the numerator is negative for all possible values of  $\mu$ .

Now define the function  $\tilde{G} : \mathbb{R} \rightarrow \mathbb{R}$ , where  $\tilde{G}(\beta_B) = \frac{\partial G}{\partial \gamma_A}$ , evaluated at  $c_A^{10}$  and arbitrary values of  $\beta_B$ . We define  $\beta_B^*$  as follows:

$$\beta_B^* = \begin{cases} 1/2 & \text{if } \tilde{G}(1/2) < 0 \\ \beta_B & \text{if } \tilde{G}(\beta_B) = 0 \text{ and } \beta_B \in (1/2, 2) \\ 1 & \text{if } \tilde{G}(1) > 0. \end{cases}$$

Thus,  $\frac{\partial G}{\partial \gamma_A}(c_A^{10}) < 0$  if  $\beta_B < \beta_B^*$ , and  $\frac{\partial G}{\partial \gamma_A}(c_A^{10}) > 0$  if  $\beta_B > \beta_B^*$ . The comparative statics result for  $\frac{\partial c_A^{10}}{\partial \gamma_A}$  follows from the implicit function theorem.

(iii) We calculate the derivatives of  $c_A^{11}$  directly.  $\frac{\partial c_A^{11}}{\partial \gamma_A}$ , in terms of  $\Omega_A$ , is:

$$\begin{aligned} & \frac{1}{32(16-(1-\gamma_A)\gamma_Aw_Aw_B)^2} [w_A^3w_B^2\gamma_A^2(1-\gamma_A)((4\beta-6)\gamma_A-3\gamma_Aw_A-16)- \\ & 4w_A^2(3(\gamma_A-1)^3w_B^3+2(1-\gamma_A)w_B^2(-2\beta_A\gamma_A^2+2\beta_B(1-\gamma_A)^2+22\gamma_A-11)- \\ & 8(1-\gamma_A)w_B(\beta_B(4\gamma_A-2)-6\gamma_A+11)-192)+ \\ & 64w_A(-16\beta_A-3(1-\gamma_A)w_B^2-4(1-\gamma_A)w_B(\beta_A-\beta_B)+24)] - \frac{\Omega_A}{4}. \end{aligned} \quad (13)$$

Differentiating (13) with respect to  $w_B$  produces:

$$\frac{w_A}{8(16 - (1 - \gamma_A)\gamma w_A w_B)^3} \left[ 12(\gamma_A - 1)\gamma_A^3 w_A^3 w_B + 512(\beta_A(4\gamma_A - 2) + (4\beta_B - 6w_B)(1 - \gamma_A) - 11) + \right. \\ \left. \gamma_A w_A^2 (3(\gamma_A - 1)^3 w_B^3 - 8(1 - \gamma_A)w_B (2\beta_B(1 - \gamma_A)^2 - 2\beta_A\gamma_A^2 + 22\gamma_A - 11) - 576\gamma_A + 384) + \right. \\ \left. 16w_A (8 (6\beta_A\gamma_A^2 - 4\beta_A\gamma_A + \beta_B (-6\gamma_A^2 + 8\gamma_A - 2) - 22\gamma_A + 11) + 9(1 - \gamma_A)^2 w_B^2 - \right. \\ \left. 2(1 - \gamma_A)w_B (2\beta_A\gamma_A(1 - 2\gamma_A) + 4\beta_B(1 - \gamma_A)^2 + 33\gamma_A - 22)) \right].$$

The denominator of this expression is obviously positive, and so the sign of the cross partial equals the sign of the numerator. It is straightforward to verify that the numerator must be negative, and therefore  $\frac{\partial^2 c_A^{11}}{\partial \gamma_A \partial w_B} < 0$ .

For  $\frac{\partial^2 c_A^{11}}{\partial \gamma_A \partial \beta_B}$ , differentiating (13) with respect to  $\beta_B$  produces:

$$\frac{w_A (64 - (1 - \gamma_A)^2 w_A w_B^2 + 4(1 - \gamma_A)w_B(8 - (1 - \gamma_A)w_A))}{2(16 - (1 - \gamma_A)\gamma w_A w_B)^2}.$$

This expression is obviously positive, as claimed. ■

**Proof of Proposition 5.** We show that the Markov chain with transition probability matrix  $\mathbf{P}$  is irreducible and aperiodic. Since the chain is finite, these features imply that it is recurrent and therefore has a unique limiting distribution.

To show irreducibility it is sufficient to demonstrate that all states communicate with a distinguished state, which we designate  $(A, 1, 0)$ . By our assumptions on  $\gamma_i$  and  $m$ , all re-election probabilities are interior. By assumption, all  $c_i^{nq}$  are also interior. Thus  $\mathbf{P}$  can be depicted as follows, where ‘+’ indicates  $P_{s,s'} \in (0, 1)$ :

$$A10 \quad A20 \quad A11 \quad A21 \quad B10 \quad B20 \quad B11 \quad B21$$

$A10$	0	+	0	+	+	0	+	0
$A20$	+	0	+	0	+	0	+	0
$A11$	0	+	0	+	+	0	+	0
$A21$	+	0	+	0	+	0	+	0
$B10$	+	0	+	0	0	+	0	+
$B20$	+	0	+	0	+	0	+	0
$B11$	+	0	+	0	0	+	0	+
$B21$	+	0	+	0	+	0	+	0

It is clear that  $P_{inq,A10} > 0$  for all states except  $(A, 1, 0)$  and  $(A, 1, 1)$ . Since  $P_{A10,A20} > 0$  and  $P_{A11,A20} > 0$ , all states can reach  $(A, 1, 0)$  in two periods. Next, from  $(A, 1, 0)$  only  $(A, 1, 0)$ ,  $(A, 1, 1)$ ,  $(B, 2, 0)$  and  $(B, 2, 1)$  cannot be reached in one period. But since  $P_{A10,B10} > 0$  and all four of these states are reachable from  $(B, 1, 0)$  in one period, we conclude that all states communicate.

To show aperiodicity, we first observe that irreducibility implies that all states have the same period. Since  $(A, 1, 0)$  can return to itself in two periods (e.g., through  $(B, 1, 0)$ ) and in three periods (e.g., through  $(B, 1, 0)$  and  $(B, 2, 0)$ ), the state  $(A, 1, 0)$  is aperiodic, and hence the Markov chain is aperiodic. ■

## 8 EMPIRICAL APPENDIX

### Text of Expert Survey Questions

Questions from Dahlström et al. (2015) are of the form: “Thinking about the country you have chosen, how often would you say the following occurs today?” Answers were provided on a scale from 1 (almost never) to 7 (almost always).

#### Variables related to good government

##### Bureaucratic efficiency

q4\_e. Public employees are absent from work with-out permission. (*Abensteeism*)

q5\_k. Public sector employees strive to be efficient. (*Efficiency*)

q5\_l. Public sector employees strive to help citizens. (*Helpful*)

##### Neutrality

q5\_f. When deciding how to implement policies in individual cases, public sector employees treat some groups in society unfairly. (*Group Bias*)

q5\_g. When granting licenses to start up private firms, public sector employees favor applicants with whom they have strong personal contacts. (*Licensing Bias*)

##### Honesty

q8\_c. Public sector employees grant favors in exchange for bribes, kickbacks or other material inducements. (*Bribes*)

q8\_d. Public sector employees steal, embezzle or misappropriate public funds or other state resources for personal or family use. (*Steals*)

#### Variables related to civil service hiring practices

q2\_a. When recruiting public sector employees, the skills and merits of the applicants decide who gets the job. (*Merit Selection*)

q2\_d. Public sector employees are hired via a formal examination system. (*Exam*)

## The PVP Measure

For each pair of parties, the measure calculates the difference in their ethnic bases of support. It then sums these differences using a polarization metric (where polarization scores are a measure that increases as one moves toward two equal sized groups).

Formally, the measure is defined as follows. First, for each pair of political parties  $i$  and  $j$  in a state, we calculate the distance between their electoral bases of support,  $\tilde{r}_{ij}$ . Formally,

$$\tilde{r}_{ij} = \sqrt{\frac{1}{2} \sum_{g=1}^G (P_g^i - P_g^j)^2}, \quad (14)$$

where  $P_g^i$  and  $P_g^j$  are the proportion of supporters of parties  $i$  and  $j$  who come from group  $g$ , and there are  $G$  groups. The maximum  $\tilde{r}_{ij}$  is 1, which occurs when all of party  $i$ 's support comes from one group, and all of party  $j$ 's support comes from another group. The minimum distance is zero, which occurs when the proportion of support that comes from each group for party  $i$  is the same as the proportion of support that comes from each group for party  $j$ . In general, as the distribution of groups supporting any two parties becomes more similar,  $\tilde{r}_{ij}$  will decline.

Second, we use the vote shares of parties to aggregate the  $\tilde{r}_{ij}$ 's, yielding the system-level measure of *PVP*:

$$PVP = 4 \sum_{i=1}^N \sum_{j=1}^N p_i p_j^2 \tilde{r}_{ij}, \quad (15)$$

where  $p_i$  is the proportion of the vote received by party  $i$  and there are  $N$  parties.

The  $p_i p_j^2$  term in the definition of *PVP* ensures that holding the ethnic distance between parties constant (and assuming it is non-zero), the measure increases as the party system moves toward two parties of equal size.

## The Data

The PVP data are from 1995-2008.

Table 3: Summary statistics of good government variables in democracies

	count	mean	sd	min	max
Abensteeism	71	4.878	1.118	2.333	6.875
Efficiency	70	3.976	1.077	2.000	6.286
Helpful	70	4.182	1.084	2.000	6.286
Group Bias	70	4.366	1.036	1.667	6.167
Licensing Bias	70	4.231	1.402	1.250	6.750
Bribes	71	4.394	1.510	1.667	7.000
Steals	71	4.558	1.489	1.750	7.000

Table 4: Bivariate correlations of good government variables in democracies

Variables	Abensteeism	Efficiency	Helpful	Group Bias	Licensing Bias	Bribes	Steals
Abensteeism	1.000						
Efficiency	0.629	1.000					
Helpful	0.707	0.917	1.000				
Group Bias	0.632	0.711	0.753	1.000			
Licensing Bias	0.734	0.831	0.824	0.776	1.000		
Bribes	0.746	0.860	0.873	0.765	0.930	1.000	
Steals	0.783	0.837	0.865	0.761	0.913	0.980	1.000