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Elections and reform: The adoption of civil service systems in the U.S. states

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Abstract

Most government bureaucracies in developed countries use civil service systems. What accounts for their adoption? We develop and test a model of bureaucratic reforms under repeated partisan competition. In the model, two political parties composed of overlapping generations of candidates compete for office. Under a spoils system, an incumbent politician can either continue to "politicize" the bureaucracy, which allows her to direct benefits to voters in a way that will increase her electoral prospects, or she can "insulate" the bureaucracy, which prevents all future winners from using the bureaucracy for electoral advantage. Our main result is that politicization persists when incumbents expect to win, and insulation takes place when they expect to lose. We test this hypothesis using data from the adoption of civil service reforms across the U.S. states. The predictions of the model are consistent with the empirical patterns leading up to the implementation of the general civil service reforms. Using both state and city level data, we observe an increase in partisan competition prior to the reforms.

Keywords

Bureaucracy; civil service; elections

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1. Introduction

Across political systems, an essential component of effective governance is the insulation of institutions from direct political pressure. Central banks typically enjoy broad latitude to set monetary policies. Independent commissions and authorities regulate significant portions of national and state economies. And in countless other bureaucratic settings, experts have formal or *de facto* autonomy to formulate or execute policies. In this paper, we ask how office-minded politicians come to insulate government institutions.

One reasonable conjecture is that when voters desire "good government", candidates for office will simply converge in Downsian fashion to the appropriate policies. While citizen preferences are undoubtedly important, their role is limited by an electoral motive. If government institutions can be used to build electoral support, and incumbent politicians can benefit disproportionately from these institutions, then they will have an incentive to withhold insulating reforms. Inefficiently politicized institutions may therefore persist even in the presence of a constituency for reform.

When might reforms take place? We argue that two factors might overcome the ability to appropriate government resources for patronage purposes. First, candidates or parties must have long time horizons. If candidates cared only about the subsequent election, then there would be little reason for reform, as politicized institutions would maximize the immediate probability of victory. But a candidate who cares about future elections may insulate institutions in order to prevent a hostile future incumbent from harming future friendly candidates. Consequently, insulation might be desirable to incumbents who perceive an imminent election loss. Second, reform also requires some form of institutional inertia. In particular, the costs of institutional transition constrain newly elected politicians (at least temporarily) from taking full advantage of their offices. Without this, new office-holders could easily unwind past policy choices. In combination, both factors intuitively give a purely election-minded incumbent an incentive to introduce reforms.

We consider these arguments in the specific context of civil service reform. Broadly speaking, these reforms implemented merit-based selection of public employees and protection from politically motivated dismissal. Since the 19th century, civil service systems have largely displaced systems based on political appointments (also known as "patronage" or spoils systems) and now cover a majority of public sector employees in most advanced and developing countries. In addition to their vast scope, civil service reforms illustrate well the electoral tensions inherent in reforms that insulate or de-politicize government. Recent empirical work suggests that civil service systems improve government performance (e.g. Rauch, 1995; Rauch and Evans, 2000), but also that spoils systems were effective at distributing benefits in ways that appear to help the incumbent party stay in power (Folke et al., 2011).

Our theoretical model attempts to capture the dynamics of election-induced reform. It is certainly not the first to recognize the constraining potential of present incumbent choices on future policies. However, it is to the best of the authors' knowledge the first to combine patronage and institutional rigidities with electoral competition over a long time horizon. The model is an infinite horizon game between two parties. Each party is composed of overlapping generations of members, with one candidate for each election. If the candidate wins the election, then she holds office for one period. The candidate cares about the electoral prospects of her two subsequent co-partisans. An incumbent can

affect their chances of victory by choosing the government's personnel system, which is either a spoils system or the civil service.

The personnel system generates the institutional inertia crucial to our theory. It matters in three ways. First, it commits the subsequent office-holder to use the same type of system to distribute spending. We assume that personnel systems can neither be established nor dismantled overnight, and so incoming office-holders must use the pre-existing personnel system, even if they plan to change it. Second, it affects the distribution of a fixed level of government spending across society. Under a spoils system, supporters of the incumbent receive targeted benefits from the government. These benefits could be in the form of pork or jobs. By contrast, a civil service distributes goods in a uniform manner throughout society. Finally, it affects the efficiency of spending. A personnel system that has been in place for more than one period will have a higher level of human capital, and therefore will distribute a higher proportion of the government dollar than a new system. This assumption reflects efficiency gains from experience enjoyed by current office-holders. Thus, a long-term spoils system run by an incumbent party will promise higher benefits to supporters than the "new" spoils system that the challenging party would be forced to implement. By eliminating the ability to discriminate among voters in the provision of benefits, the civil service eliminates human capital differences as a consideration for voters.[1]

The incumbent's choice of personnel system is constrained in one important way: civil service reform is "absorbing". Incumbent office-holders may switch from a spoils system to the civil service. However, once a civil service system is in place, politicians cannot revert to a spoils system. Historically, reversions to spoils systems in the U.S. are quite rare, and this assumption reflects several plausible accounts for this fact. For example, voters may derive intrinsic benefits from the civil service (e.g. Shefter, 1977). Civil service reform may also create powerful interest groups, the employees and their unions, that lobby to protect its existence (Johnson and Libecap, 1994).[2]

The electorate consists of a continuum of voters. Voters are prospective, and evaluate each party based on its fixed policy platform, the spoils potentially offered by the incumbent party, and two random utility shocks. The first occurs before the personnel system choice, and gives the incumbent a sense of her party's electoral future, while the second occurs after the policy choice. Citizens vote after seeing both shocks. Importantly, voters do not care about good government *per se*. This allows us to isolate the pure electoral incentive behind insulating political institutions.

The game has an intuitive stationary equilibrium that features symmetric strategies by both parties. The key intuition of the equilibrium is that an incumbent might kill its own spoils system (reducing the next generation's chances of re-election) when its electoral prospects are dim. This prevents future office holders from the same party from being disadvantaged by the rival party's spoils system. As a result, conditional upon being the incumbent, an ideologically unfavored party will be more likely to introduce civil service reform. The model also predicts that the larger the human capital advantage due to experience, the more friendly the district is to the incumbent party, and the more convergent are political parties' platforms, the more likely a spoils system is to survive.

In the empirical section of the paper, we first provide background information on the adoption of the civil service systems across the U.S. states. We provide some anecdotal evidence that the loss of human capital among state employees that followed changes

in state administrations was a common concern among the proponents of civil service reforms. Also, the majority of the reforms were implemented by parties that had been in control of the legislature for an extended period of time. Finally, we provide some evidence that when a dominant party was present prior to the establishment of a civil service system, the average underlying electoral support for that party was declining in the years immediately proceeding the reforms. We observe this pattern using both state- and city-level data. This pattern is consistent with the predictions of the model.

1.1. Related literature

Perhaps the prevailing explanation for civil service reform focuses on the demand for public goods in society. Skowronek (1982) and Knott and Miller (1987), among others, examine the composition of the progressive era coalitions that fought over civil service adoption. In an early model, Reid and Kurth (1988, 1989) argue that the patronage and civil service systems were both uniquely suited to maximize votes and political power at the time they were adopted, given citizen demand for public and private goods.

Electoral incentives have also played a central role in theories of civil service reform. Geddes (1994) considers civil service reform as a social dilemma, whereby individual parties are unwilling to forgo the electoral advantages of patronage in order to realize the collective benefit of improved state capacity. The prediction, examined in the context of several Latin American countries, is that high levels of electoral competition offer the best opportunity for reform. In a model that is perhaps most closely related to ours, Mueller (2009) presents a theory that links meritocratic bureaucracies and political competitiveness. The model resembles in some respects a single period of the model presented in this paper: an incumbent chooses a personnel system that determines bureaucrat selection and the distribution of payoffs across society in the second period. The incumbent maximizes future benefits for constituents, and thus picks patronage if her party's chances of re-election and the benefits of patronage are high. By contrast, politicians in our model are office-minded and would not renounce patronage in a one-shot setting, as doing so would forego electoral benefits. Variations of this "insurance" argument have also appeared in theories of general institutional reform (de Figueiredo, 2002; Besley and Persson, 2011) and electoral system reform (Boix, 1999). Notably, Acemoglu et al. (2011) develop a model of electorally-induced politicization of the bureaucracy that generates the reverse prediction. In their work, political transitions create a large and inefficient bureaucracy because bureaucrats can be bought off as swing voters.

Two prominent accounts of civil service adoption focus on agency problems between politicians and bureaucrats, which our model does not address. Johnson and Libecap (1994) describe two factors that influence the choice of personnel system by vote-maximizing politicians. The first is voter preferences: some voters are responsive to the quality of government, while others care about campaign services rendered by patronage workers. The second is the size of government: larger government exacerbates transaction cost problems that elected leaders have in monitoring bureaucrats' partisan activities. Over time, this causes politicians to lean toward the selection and retention of high-quality personnel. Relatedly, in the work of Horn (1995), civil service systems solve a bureaucratic non-compliance problem. If an incumbent's probability of re-election is exogenously low, then patronage appointees might shirk their duties. Civil service

laws therefore give bureaucrats incentives to keep performing in the face of electoral uncertainty.

Since civil service protections typically include strong protections from job dismissal, several rationales for workplace tenure are relevant for the adoption of civil service reform as well. These include, *inter alia*, preventing sabotage and rewarding good employee types or performance (e.g. Lazear, 1991). Sorauf (1959, 1960) argues that spoils systems were threatened across the U.S. by labor market conditions. In addition to being poorly compensated relative to the private sector, patronage jobs suffered from inherent job insecurity. In this environment, job protections would be essential for attracting high quality employees. Of particular interest is Gailmard and Patty (2007), who develop a model in which a bureaucrat decides both whether to remain in government and whether to invest in policy-relevant expertise. In equilibrium, tenure is important for inducing policy-motivated bureaucrats to make initial investments in policy expertise. This investment may allow the legislature to realize better policy outcomes through increased delegation of authority.

Another line of work examines the effects of personnel systems. Numerous authors have documented the effects of public sector employment on electoral outcomes across nations (e.g. Roett, 1999; Golden, 2003). Folke et al. (2011) find that the spoils system did indeed provide a large electoral advantage in U.S. state elections, especially for "dominant" parties. This fact supports our assumption that entrenched parties will be able to field more effective workers.

While we do not accord civil servants any competence advantage over patronage appointees, a wide range of empirical research generally supports the notion that civil service improves bureaucratic performance. Cross-sectional studies on the effects of agency composition include those of Krause et al. (2006), on U.S. state governments and Lewis (2008) on U.S. federal agencies. Rauch (1995) develops a model that predicts higher bureaucratic investment in long-term economic development policies under different civil service reform, and tests the hypothesis on U.S. municipal governments during 1902–1931. Finally, Rauch and Evans (2000) empirically examine a cross-section of 35 developing and middle-income countries, and find a strong relationship between merit recruitment and both bureaucratic performance and low corruption.

2. The model

We present a simple model of partisan elections and personnel system policy over an infinite horizon. In each period t there is a competition between candidates from two parties, L and R. Parties have fixed platforms p_L and p_R ($p_L < 0 < p_R, p_L = -p_R$) that belong to a policy space represented by $\Re$. The winner adopts that platform if elected. The winner may also choose the government's personnel system. The personnel system chosen in period t is labeled $a_t \in \{c, s\}$, where c denotes a civil service and s the spoils system. Since spoils systems are obviously attached to the party in office, there are three personnel systems: spoils systems for parties L and R, and the civil service. Incumbent office-holders may switch from a spoils system to the civil service, but not from a civil service system to a spoils system.

Parties are composed of overlapping generations of members. In each period t, one member of each party is designated as its candidate. If a candidate wins, then she holds

office for a single period. If she loses, she cannot run for office again. Each candidate receives a payoff of 1 if she wins her election, and also receives 1 for the election of each of her two succeeding candidates. The interpretation is that at any given period, the party is composed of a "senior" member who runs for and possibly holds office, an "up and coming" member who would be the next candidate in line, and a "junior" member who would come after that. If given the opportunity, the senior member therefore chooses a_t with the electoral prospects of both of her co-partisans in mind. Parties cannot credibly commit to a_t or any policy other than their platform.

Voters in the game care about ideology, valence and government benefits. There is a continuum of voters with quadratic policy utility over $\Re$. Their ideal points uniformly distributed on some closed, bounded set $X \subset \Re$, with median z_M. Voters are also affected by additive valence shocks in each period. The shocks $v_t^1 \sim U[-\omega, \omega]$ and $v_t^2 \sim U[-1, 1]$ give a relative valence advantage to party L. The shocks are independent and identically distributed (i.i.d.) within and across periods, but one occurs after the incumbent's personnel system choice. From the perspective of the incumbent party, the first shock may be useful for giving a sense of its electoral prospects, while the second is completely random. A voter with ideal point at z thus receives utility $u_z = -(z - p_L)^2 + v_t^1 + v_t^2$ from voting for party L. Similarly, that voter receives $-(z - p_R)^2$ from voting for party R.

Under a spoils system, each citizen additionally receives utility from supporting the election winner. This benefit may be understood as an expectation of targeted expenditures or patronage appointments, both of which are made plentiful by a spoils system. Each incumbent distributes a pool of resources worth $g \in (0, 1)$ to its supporters after each election. This patronage is automatically distributed upon election, and candidates are unable to discriminate amongst campaign supporters, for example by targeting moderate voters. A citizen who does not support the winner receives zero in patronage benefits that period.[3]

A key feature of the model is that the bureaucracy's human capital matters for the efficiency of government spoils. We model this idea in the simplest possible way, by assuming that a proportion k of distributed government resources are actually received, and that this proportion is increasing in the length of time that a given personnel system stays in place. The parameter k might then correspond to the accumulated skill level in the bureaucracy. For each possible personnel system, $k \in \{\underline{k}, \overline{k}\}$, where $0 < \underline{k} < \overline{k} < 1$ and $\hat{k} = \overline{k} - \underline{k}$. Upon a change of personnel system (i.e. either a partisan shift or civil service reform), "new" bureaucrats are of the corresponding low type. Bureaucrats move from the low to high level of human capital in the second period of the system's existence, and remain at the high level as long as that system remains in place.[4] We label the human capital level under party i spoils system k_i. To avoid some uninteresting corner solutions, we assume that $\omega > 1$ and $\omega > 1 + 4z_M p_R$. This assumption ensures that under any personnel system, a sufficiently good or bad initial shock v_t^1 will cause a candidate's victory or defeat, respectively.

While the preceding discussion establishes what voters can expect under a spoils system, it does not address what they receive under a civil service. Presumably, all voters would receive identical expected allocations under the civil service, regardless of their vote.[5] They would also enjoy higher allocations under an "experienced" civil service. But the way in which government spending is allocated under the civil service is irrelevant to

the model because the government in each period "inherits" the personnel system choice of the previous period. Thus, under the civil service, the prospect of government benefits does not enter into the citizens' voting decisions. By contrast, the different human capital levels in the parties' spoils systems will play a central role in each election.

The sequence within each period t is as follows.

1. Government benefits are allocated.
2. Shock v_t^1 is realized.
3. If $a_{t-1} = s$, the incumbent politician chooses personnel system a_t; otherwise $a_t = c$
4. Shock v_t^2 is realized.
5. Citizens vote.

It is worth emphasizing the effect of this timing on the implementation of government personnel systems. If party L had a spoils system in period t and lost the election, party R would be forced to use its own spoils system in $t + 1$, even if it chose to switch to a civil service system at $t + 1$. That civil service system would come into effect in $t + 2$, regardless of who wins the $t + 1$ election. This assumption captures the idea that personnel systems are administratively costly, and therefore bind the choices of immediately succeeding office-holders to some extent.

We characterize stationary, symmetric subgame perfect equilibria (SSSPE), and so omit time subscripts throughout. Each voter's strategy is then given simply by the mapping $v : \{L, R\} \times [-\omega, \omega] \times \{c, s\} \times [-1, 1] \rightarrow \{L, R\}$. Politicians may only make a personnel choice if there is a spoils system. This is given by the mapping $\alpha_i : [-\omega, \omega] \rightarrow \{c, s\}$.[6]

2.1. Elections

To characterize the equilibrium, consider first the citizens' voting behavior. At the voting stage, each citizen knows the aggregate valence shock $V = v^1 + v^2$. Observe first that any citizen to the left of another must receive strictly higher utility from party L and lower utility from party R. Voters must then be partitioned into two convex sets, with "leftists" voting for L and "rightists" voting for R.

Suppose initially that there is a spoils system ($a = s$). Both parties must then "offer" potential patronage to voters, as well as the possibility of targeted transfers. The ideal point of the citizen indifferent between parties is characterized by

$$-(z - p_L)^2 + V + k_L g = -(z - p_R)^2 + k_R g$$
$$\Leftrightarrow \quad z = \frac{V + (k_L - k_R)g}{4p_R}. \tag{1}$$

Thus as V or L's relative human capital advantage increases, so does the measure of citizens willing to vote for L. Since voters' evaluations of human capital depend only the difference between k_L and k_R, it will be convenient to let $K = k_L - k_R$ denote L's relative advantage in human capital in the subsequent period.

Manipulating (1), L will win the election if its valence advantage is sufficiently high:

$$V > v^s \equiv 4z_M p_R - Kg. \tag{2}$$

Under a *status quo* spoils system, the incumbent party i will have a human capital advantage in the election ($k_i = \bar{k}$) that will lead to greater perceived effectiveness by voters. This implies that $|K| > 0$, and has the effect of moving v^s in its favor; i.e. enlarging the set of citizens who prefer party i.

Under a civil service system ($a = c$), the human capital levels under both parties are always identical. Thus, the parties' electoral prospects under the civil service are identical to their chances under a spoils system when $K = 0$. Party L will then win the upcoming election if

$$V > v^c \equiv 4z_M p_R. \tag{3}$$

2.2. Personnel policy strategies

To derive the symmetric equilibrium strategies, we characterize "cutoff" strategies with valence thresholds θ_L, θ_R. Here θ_L is the cutoff below which a party L incumbent chooses a civil service system, and above which she continues with a spoils system, given the existence of a spoils system. Similarly, θ_R is the cutoff above which a party R incumbent prefers a civil service system, and below which she continues the spoils system. Thus, at $v^1 = \theta_i$, party i is indifferent between retaining a spoils system and switching to a civil service system. Note that from the incumbent's perspective, these thresholds are independent of the "current" level of K. This is true because the incumbent will always enjoy a human capital advantage in the subsequent (i.e. election-relevant) period.

It will first be necessary to characterize "interim" and *ex ante* probabilities of electoral victory in each period. With these in place, we can write a system of equations characterizing a SSSPE.

The interim victory probability depends on the realization of v^1. Denote by $p^s(v^1, K) = \Pr\{v^2 > v^s - v^1\}$ the probability that party L wins the subsequent period's election under a spoils system, given v^1 and K. Likewise, let $p^c(v^1)$ denote the probability that party L wins the subsequent period's election under the civil service (note that this value does not depend on K). Using (2) and (3), we have the following general expressions:

$$p^s(v^1, K) = \begin{cases} 1 & \text{if } v^1 > 1 + 4z_M p_R - Kg \\ \frac{1 - 4z_M p_R + Kg + v^1}{2} & \text{if } v^1 \in [-1 + 4z_M p_R - Kg, 1 + 4z_M p_R - Kg] \\ 0 & \text{if } v^1 < -1 + 4z_M p_R - Kg. \end{cases} \tag{4}$$

$$p^c(v^1) = \begin{cases} 1 & \text{if } v^1 > 1 + 4z_M p_R \\ \frac{1 - 4z_M p_R + v^1}{2} & \text{if } v^1 \in [-1 + 4z_M p_R, 1 + 4z_M p_R] \\ 0 & \text{if } v^1 < -1 + 4z_M p_R. \end{cases} \tag{5}$$

Given these interim probabilities, the corresponding *ex ante* probabilities that party L wins the subsequent election conditional upon a can be found by integrating over v^1. Under a civil service system, there is no human capital advantage and no possibility of switching personnel systems; thus

$$\begin{aligned} P^c &= \int_{-\omega}^{\omega} \frac{p^c(v)}{2\omega} \, dv \\ &= \frac{1}{2} - \frac{2z_M p_R}{\omega}. \end{aligned} \tag{6}$$

Here P^c does not depend on human capital (K), which is consistent with the intuition that a party cannot use government personnel practices to its benefit. It does depend on the electorate's ideological bias (z_M) and the size of electoral shocks (ω), with less biased electorates or more random elections leading to more equal probabilities of victory. The probability of a party R victory is simply $1 - P^c$.

Similarly, the probability of a party L victory when it is the incumbent (and therefore has a human capital advantage) under a spoils system can be calculated as follows:

$$
P^s(\hat{k}) = \int_{-\omega}^{\theta_L} \frac{p^c(v)}{2\omega} \, dv + \int_{\theta_L}^{\omega} \frac{p^s(v, \hat{k})}{2\omega} \, dv
$$

$$
= \begin{cases}
\frac{1}{2} - \frac{4z_M p_R - \hat{k}g}{2\omega} & \text{if } \theta_L \leq -1 + 4z_M p_R - \hat{k}g \\
\frac{1}{2} - \frac{(\theta_L - 4z_M p_R + \hat{k}g - 1)^2 + 4\theta_L}{8\omega} & \text{if } \theta_L \in (-1 + 4z_M p_R - \hat{k}g, -1 + 4z_M p_R] \\
\frac{1}{2} + \frac{8(\hat{k}g - 2)z_M p_R + 2\hat{k}g(1 - \theta_L) - (\hat{k}g)^2}{8\omega} & \text{if } \theta_L \in (-1 + 4z_M p_R, 1 + 4z_M p_R - \hat{k}g] \\
\frac{1}{2} + \frac{(\theta_L - 4z_M p_R + 1)^2 - 4\theta_L}{8\omega} & \text{if } \theta_L \in (1 + 4z_M p_R - \hat{k}g, 1 + 4z_M p_R] \\
\frac{1}{2} - \frac{2z_M p_R}{\omega} & \text{if } \theta_L > 1 + 4z_M p_R.
\end{cases} \quad (7)
$$

Unlike P^c, the probability of victory here can depend on both the extent of the human capital advantage ($\hat{k}g$) and the location of the valence threshold for changing systems (θ_L). Note that in the final case, $P^s(\hat{k})$ does not depend on $\hat{k}g$, since the threshold for switching is so high that party L would switch even when it is assured of victory. Consequently, the probability of victory under this (somewhat implausible) strategy is the same as P^c. The corresponding probability of a party R victory is $1 - P^s(\hat{k})$.

Finally, the probability of a party L victory with a party R incumbent under a spoils system is

$$
P^s(-\hat{k}) = \int_{-\omega}^{\theta_R} \frac{p^s(v, -\hat{k})}{2\omega} \, dv + \int_{\theta_R}^{\omega} \frac{p^c(v)}{2\omega} \, dv
$$

$$
= \begin{cases}
\frac{1}{2} - \frac{2z_M p_R}{\omega} & \text{if } \theta_R \leq -1 + 4z_M p_R \\
\frac{1}{2} - \frac{(\theta_R - 4z_M p_R + 1)^2 + 16 z_M p_R}{8\omega} & \text{if } \theta_R \in (-1 + 4z_M p_R, -1 + 4z_M p_R + \hat{k}g] \\
\frac{1}{2} + \frac{8(\hat{k}g - 2)z_M p_R - 2\hat{k}g(\theta_R + 1) + (\hat{k}g)^2}{8\omega} & \text{if } \theta_R \in (-1 + 4z_M p_R + \hat{k}g, 1 + 4z_M p_R] \\
\frac{1}{2} + \frac{(4z_M p_R + \hat{k}g - \theta_R - 1)^2 - 4\theta_R}{8\omega} & \text{if } \theta_R \in (1 + 4z_M p_R, 1 + 4z_M p_R + \hat{k}g] \\
\frac{1}{2} - \frac{4z_M p_R + \hat{k}g}{2\omega} & \text{if } \theta_R > 1 + 4z_M p_R + \hat{k}g.
\end{cases} \quad (8)
$$

These victory probabilities respond in intuitive ways to incumbency and the cutoffs θ_L and θ_R. Regardless of θ_L and θ_R, $P^s(-\hat{k}) \leq P^c \leq P^s(\hat{k})$. Thus, using any cutoff strategies of the specified form, a party must benefit (weakly) from incumbency when competing under a spoils system. When a voter is not ideologically predisposed toward either party ($z_M = 0$), that party will have an *ex ante* probability of victory of at least one half. Under a spoils system, a high threshold θ_L minimizes a party L's *ex ante* probability of winning the subsequent election when it is the incumbent.

The equilibrium is characterized by the following system of equations. At each θ_i, party i is indifferent between a civil service system and a spoils system. Thus, we have

$$p^s(\theta_L, \hat{k})(1 + P^s(\hat{k})) + (1 - p^s(\theta_L, \hat{k}))P^s(-\hat{k}) = p^c(\theta_L)(1 + P^c) + (1 - p^c(\theta_L))P^c$$
$$(1 - p^s(\theta_R, -\hat{k}))(2 - P^s(-\hat{k})) + p^s(\theta_R, -\hat{k})(1 - P^s(\hat{k})) = (1 - p^c(\theta_R))(2 - P^c)$$
$$+ p^c(\theta_R)(1 - P^c).$$

Here the first equation characterizes party L's switch from a spoils system to a civil service, and the second party R's corresponding choice. Simplifying yields

$$p^s(\theta_L, \hat{k})(1 + P^s(\hat{k})) + (1 - p^s(\theta_L, \hat{k}))P^s(-\hat{k}) = p^c(\theta_L) + P^c \qquad (9)$$
$$(1 - p^s(\theta_R, -\hat{k}))(2 - P^s(-\hat{k})) + p^s(\theta_R, -\hat{k})(1 - P^s(\hat{k})) = 2 - p^c(\theta_R) - P^c. \qquad (10)$$

The result below establishes the basic prediction of the model: a spoils system will be retained as long as the incumbent party's electoral prospects are good. When they become sufficiently bad, a transition to the civil service will occur.

The cutoff equilibria have some simple properties. The incumbent party will certainly switch when it will lose the next election with certainty under the spoils system. Interestingly, it will also switch even when there is a small probability of winning under the spoils system but zero probability of winning after a switch. This happens because the incumbent is willing to sacrifice the "up and coming" member's electoral chances completely. Switching to a civil service system ensures her loss but gives the "junior" member a victory in the following election with probability P^c.

While we do not show that cutoff equilibria are unique, there is a unique equilibrium with an intuitive symmetry property. Here, the parties' cutoffs are symmetric with respect to $4z_M p_R$, and as a result both parties use the same probability of winning the next election as a threshold for switching.

Proposition 1 (Cutoff equilibrium). *In any cutoff equilibrium, $\theta_L^* \in (-1 + 4z_M p_R - \hat{k}g, -1 + 4z_M p_R)$ and $\theta_R^* \in (1 + 4z_M p_R, 1 + 4z_M p_R + \hat{k}g]$. There exists a unique equilibrium such that $4z_M p_R - \theta_L^* = \theta_R^* - 4z_M p_R$.*

Proof. All proofs are given in the Appendix.

The equilibrium cutoffs imply that when the voter is not biased toward either party ($z_M = 0$), the probability of adopting civil service reform is no greater than $(\omega - 1)/(2\omega)$. A closed-form solution for θ_L^* can be derived using standard techniques for solving cubic expressions. Unfortunately, the expression is highly complex and unintuitive. It is possible, however, to use the derivation in the proof of Proposition 1 to derive some comparative statics on the key parameters of the model.

Comment 1 (Comparative statics). *θ_L^* is decreasing in ω, $\hat{k}$ and g and increasing in z_M and p_R.*

The results for $\hat{k}$ and g demonstrate that increasing the value of "expert" patronage will raise the chances of retaining a spoils system. Equivalently, it makes transitions to a civil service more difficult. The result for z_M establish a simple effect of ideology: a spoils
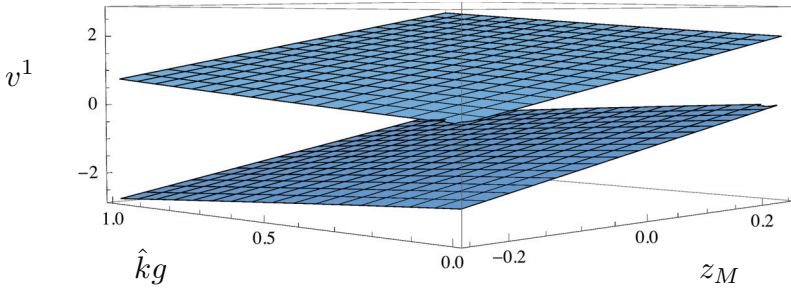
Figure 1. Equilibrium cutoffs, θ_L^* and θ_R^*. Here $\omega = 3$. The bottom surface depicts the values of v^1 *below* which party L switches to the civil service, and top surface the values *above* which party R switches to the civil service. As shown in Comment 1, party L becomes more likely to switch as the district becomes ideologically unfavorable (z_M increases), and as the benefits of patronage ($\hat{k}g$) decrease. Party R's strategy is symmetric.

system is more likely to be retained as a district becomes more ideologically "friendly" to the incumbent party. That is, an incumbent will be more inclined to neutralize a spoils advantage when the voter favors the opposing party. Similarly, as party platforms diverge, a spoils system becomes less likely to be retained. Finally, the result for ω is more difficult to interpret because changing ω also changes the support of v^1 and, hence, the *ex ante* probability of a system switch.

Figure 1 illustrates the comparative statics for θ_L^* and θ_R^* across different values of z_M and $\hat{k}g$, holding ω fixed. The illustrated cutoffs allow us to calculate easily the implied probability of reform. For $\omega = 3$, the *ex ante* probability of moving from a spoils to a civil service system when $\hat{k} = 0.25$ and $z = 0$ is 0.304. As $\hat{k}$ increases to 0.75, this probability declines to 0.241. And as z_M increases to 0.25 (holding $\hat{k}$ at 0.25), this probability increases to 0.471.

Although Comment 1 is not very informative about the effect of ω on the probability of reform, numerical results suggest that increased electoral uncertainty reduces the likelihood of reform. Figure 2 plots the effect of ω on the probability of civil service reform, holding z_M fixed. Greater uncertainty reduces the electoral value of the spoils system, and hence also the need to protect future candidates from an opponent's spoils system.

It is worth commenting on two simple extensions to this model. First, as the U.S. federal case illustrates (e.g. Lewis, 2008), an incumbent may use civil service reform as a way of "locking in" current bureaucrats, as opposed to replacing them. In the context of our model, this would allow a previous incumbent to continue to distribute benefits to supporters. We believe that this variant would increase the tendency toward reform; however, there remain good reasons for why secure incumbents would not implement reform. Spoils bureaucrats are presumably easier to control by elected officials, and thus might promise greater benefits to supporters than sympathetic civil servants. Second, an incumbent may reverse civil service reform after implementation, as several states did before adoption became permanent. Although we do not present the model here, it can be shown that a version of this model that fixes $z_M = 0$ and allows incumbents with a
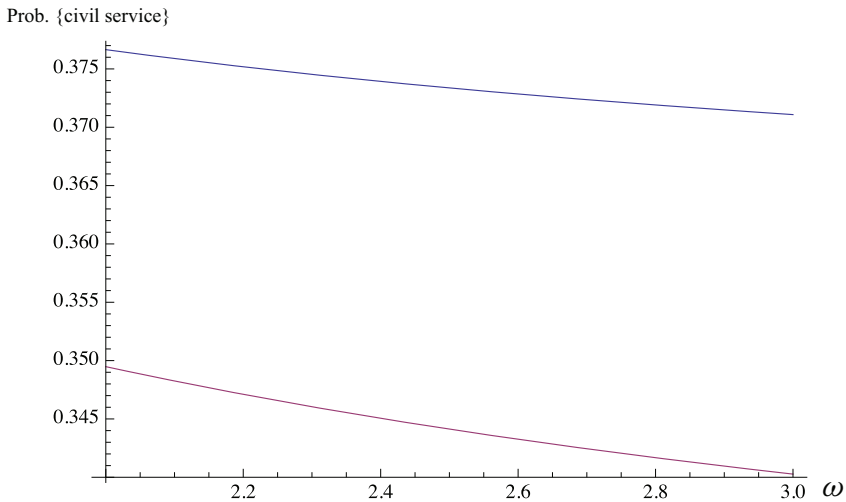
Prob. {civil service}

Figure 2. Probability of reform and electoral uncertainty. For $z_M = 0.1$, this plot depicts the probability that party L adopts the civil service when $\hat{k} = 0.25$ (top curve) and when $\hat{k} = 0.5$ (bottom curve), as a function of ω.

civil service system to switch to a spoils system would produce similar results. That is, starting from either regime, an incumbent will opt for a civil service system when its electoral prospects are bad. However, this model also predicts that reversions to spoils systems would be frequent, and that other factors, such as voter support for reforms or superior government performance, might be necessary to generate persistent civil service reform.

3. Civil service reform in the U.S. states

In this section we examine the introduction of civil service reforms in the U.S. states. In particular, we focus on the association between civil service reforms and political competition discussed in the above model. We also provide some additional evidence from the introduction of civil service reforms in U.S. cities.

3.1. Background

Prior to the introduction of civil service reforms, the conventional wisdom was that political parties would often fill positions in the state bureaucracies with patronage appointments. These state employees were expected to help support the party who appointed them. Pollock (1937: p. 32) writes, "Employees who are politically appointed are naturally expected to attend political meetings, make speeches, canvas voters, and do all the other things involved in political activity." State employees were often expected to contribute part of their salaries to the party in control of the government. In comparing the

electoral advantage from controlling the state government before and after the introduction of civil service reforms, Folke et al. (2011) find that the advantage was larger when parties had access to patronage.

While the use of patronage for electoral purposes by state parties has been widely discussed (e.g. Valelly, 1989), less is known about why political parties in the states were willing to relinquish their power to make these appointments. Ruhil and Camoes (2003: p. 27) write, "while some scholars...have studied federal adoption of the merit principle, students of American political development, state politics, and bureaucracy have virtually ignored an intriguing puzzle vis-a-vis state merit adoption." The forces behind federal civil service reform at the end of the 19th century did not push states to enact similar legislation insulating state employees from political pressures. With the exceptions of Massachusetts and New York, comprehensive civil service reform at the state level lagged behind the federal level by many decades. Only nine states had introduced general civil service reforms by 1936, and a majority of the states did not adopt such legislation until the second half of the 20th century.[7]

In the debates over civil service reform, political competition, at least to the extent that it increased turnover in state employees, was often cited by reform proponents as a reason to switch to a merit system. Significant turnover in state employees was commonly argued to reduce the efficiency of bureaucracies which would be staffed with inexperienced workers, and there was often a monetary cost for "breaking in" the new employees.[8] These inefficiencies were particularly noticeable when a political party in control of the state government for a substantial period of time was voted out of office. For example, the Michigan state legislature experienced a shift in partisan control just prior to the civil service reforms in 1937. The Republican party in Michigan controlled both chambers of state legislature continuously for four decades until finally losing to the Democrats in 1932. In the year prior to the 1932 election (March 1931 to March 1932), there was only 11.3% turnover among incumbent Michigan state employees working in the various state departments. During the first year after Democrats took control of the Michigan government (i.e. March 1933 to March 1934), the turnover rate among incumbent state employees more than doubled to 22.9%.[9] An editorial in one Michigan newspaper stated:

> To the average citizen out in the State it makes no difference whether these positions are held by Democrats or Republicans, but there is a growing objection to the necessity of having these minor State positions changed every time there is a turnover in State administrations. This defect in our State government has been strikingly noticeable because of the in and out fight between the Republicans and Democrats, with first a Democrat and then a Republican administration, then again a Democratic administration since the election in 1932 .... Michigan is in a position today as being of the States that is no longer politically safe for either Democrats or Republicans. As a consequence the civil service measure is a proposition that will not only mean monetary savings to the taxpayers but should build up a greater efficiency in State services. (*The Owosso Agus-Press*, Tuesday 6 April 1937)

Similar claims were made in other states where a party lost control of the state government after being in power for an extended period of time.[10,11]

In Table 1 we present some information about when states enacted more "comprehensive" civil service reforms. The dates that the civil service systems were established are based on information gathered from Council of State Governments (1935–2010), Civil Service Assembly of the United States and Canada (1940), and Aronson (1979).[12] It is

Table 1. Introduction of general civil service reforms

State	Year Intro	Party Dom Prev 20 Yrs	Party Dom Prev 10 Yrs	State	Year Intro	Party Dom Prev 20 Yrs	Party Dom Prev 10 Yrs
AK	1960	–	–	MT	1976	50	
AL	1939	100	X	NC	1949	100	X
AR	1968	100	X	ND	1974	90	X
AZ	1968	90	X	NE	1974	–	–
CA	1913	95	X	NH	1954	100	X
CO	1918	50	X	NJ	1908	70	X
CT	1937	75		NM	1962	90	X
DE	1966	60	X	NV	1953	20	
FL	1968	100	X	NY	1883	65	
GA	1953	100	X	OH	1913	50	
HI	1955	–	–	OK	1958	100	X
IA	1966	90	X	OR	1945	80	
ID	1969	75	X	PA	1968	60	
IL	1905	75	X	RI	1939	80	
IN	1941	50		SC	1973	100	X
KS	1941	100	X	SD	1968	90	X
KY	1954	100	X	TN	1937	100	X
LA	1940	100	X	TX	N/A	–	–
MA	1885	100	X	UT	1962	40	
MD	1921	90	X	VA	1942	100	X
ME	1937	100	X	VT	1950	100	X
MI	1937	85		WA	1961	60	
MN	1939	–	–	WI	1905	80	X
MO	1946	60		WV	1989	100	X
MS	1976	100	X	WY	1956	60	X

commonly noted that states faced federal pressure to enact civil service reforms following the 1939 amendment to the Social Security Act. The amendment required states to enact merit-based personnel systems for state and local government employees working in welfare, health, and unemployment compensation agencies, as a condition for receiving federal grants-in-aid. The states were required to comply by 1 January 1940, but most responded by enacting only a partial reform.[13] In the years around the amendment, 1938 to 1941, only six states enacted general civil service reform. Even into the early 1950s, a majority of states were still operating under a patronage system. Moreover, Folke et al. (2011) provide evidence that the early partial reforms tended to cover only a small percentage of state employees.[14]

Table 1 also presents information about the degree to which one political party controlled both chambers of the state legislature in the period prior to the introduction of civil service reforms. The third and seventh columns of Table 1 provide the share of election periods in which the same party was dominant in the state legislature in the 20-year period prior to the reform.[15] In only a minority of states was the reform enacted when there was no dominant party in the state legislature. In all but five cases, when a party controlled both chambers for more than 60% of the two decades prior to the reform, that

party was also in control of both chambers in the year prior to when the general civil service system was established. Columns four and eight highlight those cases where one party was in control of both chambers of the state legislature at least 8 of the 10 years prior to the reform. As is apparent in these columns, the dominant party also tended to control the state legislature in years immediately prior to the enactment of civil service. These patterns are consistent with the model, in that the reforms tended to be enacted by parties that had utilized the patronage system for an extended period prior to the reforms.

3.2. Civil service reform and political competition

In this section we examine whether the trends in underlying party support conform to our theoretical predictions. The main prediction of the model is that the relative value of a civil service regime will increase as the underlying electoral support for the party in power decreases. Thus, we examine the relationship between the underlying support for the dominant party, as measured by the vote share in federal elections, and the implementation of a general civil service reform. According to the model, we should expect the underlying electoral support for the dominant party to decrease in the years prior to the reform.

To have a meaningful measure of underlying support, we focus our attention on those states where there was a dominant party prior to the introduction of civil service reforms. We define a dominant party as one that held full control of the state legislature for 60% of the election periods during the 20 years prior to the reform. The underlying electoral support for the dominant party is measured by the average presidential vote share for the dominant party's candidate. We exclude elections for statewide offices from our measure of underlying electoral support, since these offices are likely to be affected by the type of state personnel system. More specifically, Folke et al. (2011) provide evidence that dominant party candidates for statewide offices may have an electoral advantage under a patronage system. Including elections for statewide office in our measure of underlying support is likely to overstate the underlying support for the dominant party prior to the civil service reforms.

In Figure 3 we plot our measure of underlying electoral support for the dominant party against the year in which the civil service reforms were enacted. The vertical axis is the presidential vote share for the dominant parties in each four year election period. The horizontal axis is the number of years before and after the civil service reform, i.e. 0 is the year the reform was enacted. Each bin covers a full election cycle, i.e. 4 years. Since there is potentially some ambiguity regarding in the exact year when political parties first started to push civil service reforms in each state and also the exact year that the reforms were fully enacted, we omit the data on underlying electoral support for the two years before and after the reform. The figure illustrates a clear decline in the average presidential vote for the dominant parties as we approach the introduction of the civil service reform. During the 20-year period leading up to the reforms our measure of the underlying electoral support for the dominant party drops about 4 percentage points, from 58% to 54%. After the introduction of the civil service reform, there is no clear trend in underlying electoral support.[16]

In Figure 4 we focus on those states where the dominant party implemented the reform. More specifically we restrict the sample to the states where the dominant party
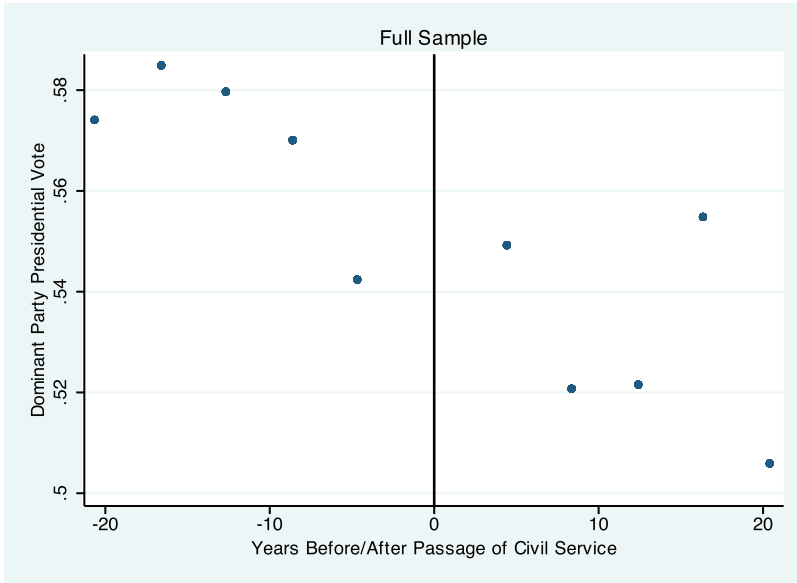
Figure 3. Change in dominant party's vote share pre- and post-reform, state level, all states with a dominant party.
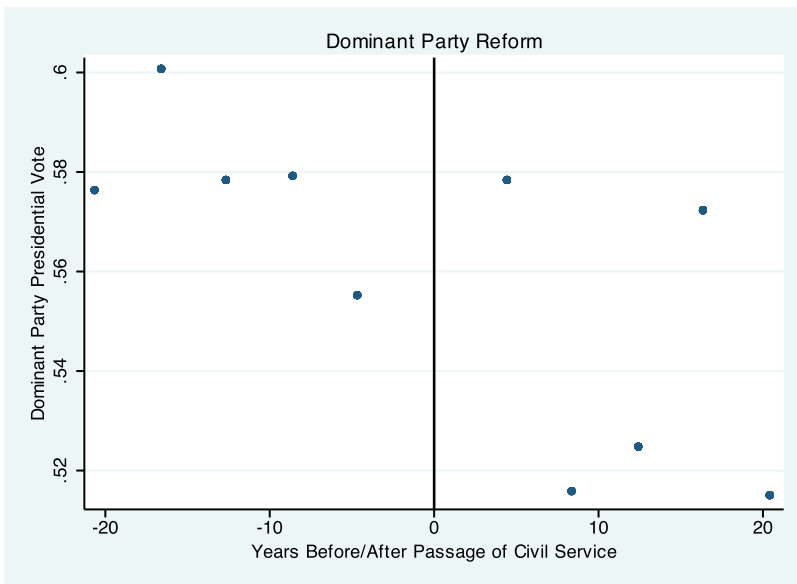

Figure 4. Change in dominant party's vote share pre- and post-reform, state level, states where a dominant party was in power at the time of reform.

controlled both the legislature and the governorship at the time of the reform. These are

the cases where the model makes the clearest predictions. According to the model we would expect a dominant party to move to civil service when it expects future elections to be competitive. Thus, we would expect to observe the civil service reforms to be implemented in response to underlying trends rather than an actual loss in power. The trend in underlying support is consistent with this prediction. We observe a decline in the presidential vote just prior to the move to civil service. Limiting the sample in this way allows us to rule out a possible alternative explanation for the pattern in Figure 3, which is that the increasing competition led to divided government. It is possible that civil service systems may be desirable with divided government for reasons related to difficulty managing state personnel with no clear political leadership and not due to electoral concerns.

As mentioned above, there were a handful of states where the initial reform law did not succeed. In a few states an initial attempt to enact civil service reforms was repealed or weakened. In Kansas the legislature refused to provide funds, rendering the law inoperative; in Michigan it was temporarily gutted then restored in an even stronger form; and in Tennessee the law allowed the governor to grant broad exemptions from the civil service, which the governor did almost immediately. In Arkansas and New Mexico the initial law was repealed outright within 2 years, and in Connecticut and Louisiana within 8 years. It is naturally of interest to examine the relationship between these within-state changes in civil service reforms and the underlying support for the dominant party. The first thing to note is that in all of these cases, the initial reform was weakened or repealed when states had a dominant party. Moreover, on average, these parties had close to a 10 percentage point higher level of underlying support in the years the reforms were rolled back as compared with years when the reforms were introduced. Second, there was no downward trend in underlying support for the dominant parties in the period prior to the rolling back of the initial reforms. If anything, the underlying support for the dominant parties was on average increasing during this period. These patterns suggest that low levels of partisan competition may have factored into the decisions to weaken civil service reforms and the increase in competitiveness may have contributed to the subsequent decisions to re-enact or strengthen the reforms.

Civil service reforms in U.S. cities   We can also examine whether a similar relationship between civil service reform and underlying electoral competition also exists for U.S. cities prior to 1940. We use information on the dates the cities established civil service agencies from a report from the *Civil Service Assembly of the United States and Canada*. For this analysis we include cities that enacted partial reforms as well as those that enacted comprehensive reforms.

Unlike the analysis of state government, we unfortunately do not have information about the partisan control of the city governments. Instead we classify a city as "Democratically dominated" if the Democrats won more than 60% of the elections for president, governor, U.S. senator, and U.S. House in the county that contains the city, in the 16 years prior to the reform (years $t-18$ to $t-3$). Similarly, we define a city as "Republican dominated" if the Republicans won more than 60 % of the elections for president, governor, U.S. senator, and U.S. House in the county that contains the city. Otherwise, we do not classify the city as dominated by either party and we drop it from the analysis.
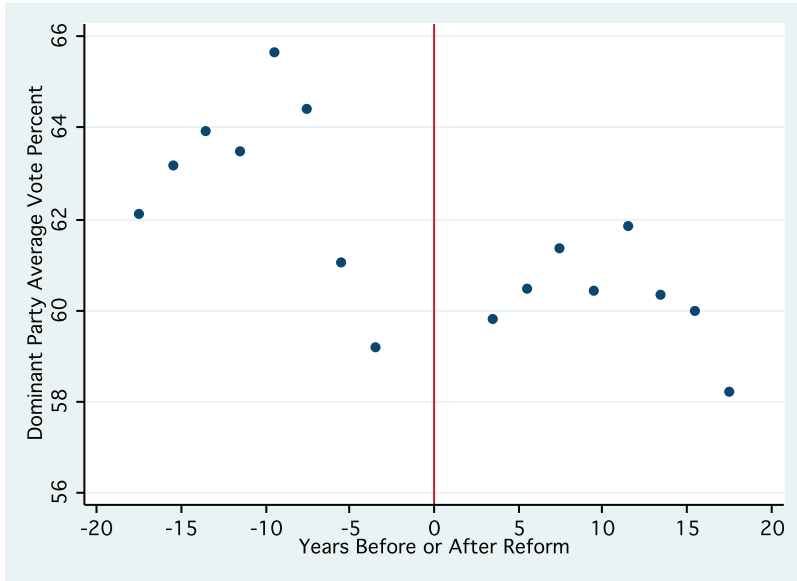
Figure 5. Change in dominant party's vote share pre- and post-reform, city level, all cities with a dominant party in county containing the city.

We also, unfortunately, do not have electoral returns at the city level. Instead we use county-level data for the county containing each city as a proxy of the underlying electoral support for the dominant party. We only include cases where the city accounts for more than half of the population of the county that contains it.[17] In our sample, we have 39 Democratic cities and 83 Republican cities with a dominant party and county-level electoral returns.

As in the state analysis, we study the trends in the dominant party's vote share in the period before and after the reform. For the cities with a dominant party, we track the average vote share won by the dominant party in years $t - 18$ to $t - 3$ for president, governor, U.S. senator, and U.S. House. We group the years into 2-year bins. Again, according to the model, we should observe a drop in the underlying electoral support for the dominant party in the period before the reforms.

As we see in Figure 5, there is a sharp drop in the dominant party's underlying electoral support in the 6 years prior to the reform. In fact, the pattern is even more striking than at the state level. As in the figure for dominant parties at the state level, we see that the underlying support for the dominant parties does not continue to decline after the reform is passed.

4. Discussion

The existing literature highlights a variety of factors affecting the decision to adopt civil service reform. The most prominent among these include the benefits of good public administration, agency problems and electoral incentives. In this paper, we present a

model that focuses on the electoral incentives for political parties to introduce these reforms. The model provides a rationale for incumbent parties to consider future electoral conditions when considering whether or not to insulate public sector workers from political forces, i.e. to adopt civil service systems. The model predicts greater political insulation when elections are expected to favor the opposition party, and greater persistence of politicization when the dominant party expects to maintain control of the government. The model also highlights how changes in electoral uncertainty, human capital and voter ideology may also affect the decision to insulate public sector employees.

Using a simple graphical analysis, we find evidence that civil service reforms were adopted in states and cities with dominant parties in years following an increase in the underlying electoral competitiveness. As we approach the passage of the civil service reform, we see a clear downward trend in underlying electoral support for dominant political parties, both at the state level and city level. At the state level this trend remains even as we restrict the analysis to the states where the dominant party was in full control of the state government at the time of the reform. An avenue of future research is to test if political competition is a better predictor of civil service reform than other common explanations, such as increases in private income and the number of government employees.

The logic in the above model also applies to contexts where the insulation of government is not necessarily beneficial to voters. In other words, electoral incentives can conceivably generate over-insulation. The framework is therefore appropriate for considering any policy area that exhibits increasing returns to experience, due either to complexity or the need for high levels of human capital. One potential extension of our model may then be to provide a more formal interpretation of some well-known existing studies on the role of elections in determining bureaucratic structure (e.g. McCubbins et al., 1987; Moe, 1989).

Appendix

Proof of Proposition 1. We proceed in two steps. The first derives necessary conditions for the location of cutoffs and shows that in any cutoff equilibrium, the spoils system is retained if and only if v^1 is sufficiently favorable. The second characterizes the symmetric cutoffs θ_L^* and θ_R^*.

First, we show that $\theta_L^* \in (-1 + 4z_M p_R - \hat{k}g, -1 + 4z_M p_R)$ and $\theta_R^* \in (1 + 4z_M p_R, 1 + 4z_M p_R + \hat{k}g]$. We consider the incentives of an incumbent party L given $v_1 = \theta_L$ in four regions, in descending value of θ_L.

(i) $\theta_L > 1 + 4z_M p_R - \hat{k}g$. This is a corner case where party L will win the next election with certainty if it retains the spoils system.

There cannot be an equilibrium in this case, since any party L incumbent with $v^1 \in (1 + 4z_M p_R - \hat{k}g, 1 + 4z_M p_R) \cap (1 + 4z_M p_R - \hat{k}g, \theta_L)$ would deviate by retaining a spoils system. This assures her of her maximum possible expected payoff (i.e. winning the next election with probability 1, as opposed to probability $(1 - 4z_M p_R + v^1)/2 < 1$ by switching, and winning the following election with probability $P^s(\hat{k}) \geq P^c$ due to her spoils system's human capital advantage). It follows that $\theta_L^* \leq 1 + 4z_M p_R - \hat{k}g$. A similar

calculation holds for higher values of and v^1, thus for any $v^1 > 1 + 4z_M p_R - \hat{k}g$, the spoils system is retained in equilibrium.

By a symmetrical argument, $\theta_R^* \geq -1 + 4z_M p_R + \hat{k}g$.

(ii) $\theta_L \in (-1 + 4z_M p_R, 1 + 4z_M p_R - \hat{k}g]$. In this case party L has an interior probability of victory under either system. We show that it will prefer to retain a spoils system for any $v^1 \in (-1 + 4z_M p_R, 1 + 4z_M p_R \hat{k}g]$. Substituting from (4) and (5) into (9) and simplifying produces the condition:

$$\frac{\hat{k}g}{2} + p^s(\theta_L, \hat{k})(P^s(\hat{k}) - P^s(-\hat{k})) \geq P^c - P^s(-\hat{k}). \qquad (11)$$

Observe that for any θ_L and θ_R, the definition of $P^s(-\hat{k})$ implies that $P^c - P^s(-\hat{k}) \leq \hat{k}g/(2\omega)$. Since $\omega > 1$, condition (11) holds if $P^s(\hat{k}) \geq P^s(-\hat{k})$, which holds trivially. It follows that $\theta_L^* \notin (-1 + 4z_M p_R, 1 + 4z_M p_R - \hat{k}g]$.

By a symmetrical argument, $\theta_R^* \notin (-1 + 4z_M p_R + \hat{k}g, 1 + 4z_M p_R]$.

(iii) $\theta_L \in (-1 + 4z_M p_R - \hat{k}g, -1 + 4z_M p_R]$. In this case party L will lose with certainty if it switches to the civil service. We show that there is a unique value of v^1 satisfying (9). Simplifying from (9) produces the condition:

$$p^s(\theta_L, \hat{k})(1 + P^s(\hat{k}) - P^s(-\hat{k})) = P^c - P^s(-\hat{k}). \qquad (12)$$

It is easily verified that for any θ_L and θ_R, $1 + P^s(\hat{k}) - P^s(-\hat{k})$ is finite and bounded from below by 1. Likewise, it is easily verified that for any θ_L and θ_R, $0 \leq P^c - P^s(-\hat{k}) \leq \hat{k}g/(2\omega)$. Observe also that $p^s(\cdot)$ is linear, with $p^s(-1 + 4z_M p_R - \hat{k}g, \hat{k}) = 0$, and $p^s(-1 + 4z_M p_R, \hat{k}) = \hat{k}g/2$. Thus, for any θ_L and θ_R, there exists a unique θ_L' satisfying (9). Furthermore, for all $v^1 > (<) \theta_L'$, a party L incumbent will optimally choose $a = s \, (= c)$.

By a symmetrical argument, for any θ_L and θ_R, there exists a unique $\theta_R' \in (1 + 4z_M p_R, 1 + 4z_M p_R + \hat{k}g]$ satisfying (10).

(iv) $\theta_L \leq -1 + 4z_M p_R - \hat{k}g$. This is a corner case where an incumbent party L is so disadvantaged that she will lose the upcoming election with certainty under either system ($p^s(\theta_L, \hat{k}) = p^c(\theta_L) = 0$). Substituting from (4)–(8) into (9) produces

$$P^s(-\hat{k}) = \frac{1}{2} - \frac{2z_M p_R}{\omega}.$$

This expression can be satisfied only if $\theta_R \leq -1 + 4z_M p_R$, which is ruled out by part (i). Otherwise, the left-hand side is always less than the right-hand side. Thus, in any equilibrium, there must be a switch to $a = c$ when $v^1 \leq -1 + 4z_M p_R - \hat{k}g$, and $\theta_L^* > -1 + 4z_M p_R - \hat{k}g$.

By a symmetrical argument, $\theta_R^* < 1 + 4z_M p_R + \hat{k}g$.

Combining results (i)–(iv), any cutoff equilibrium must satisfy $\theta_L^* \in (-1 + 4z_M p_R - \hat{k}g, -1 + 4z_M p_R)$ and $\theta_R^* \in (1 + 4z_M p_R, 1 + 4z_M p_R + \hat{k}g]$.

Second, given these restrictions on θ_L^* and θ_R^*, we can characterize the symmetric equilibrium thresholds θ_L^* and θ_R^*. Suppose that $p^s(\theta_L^*, \hat{k}) = 1 - p^s(\theta_R^*, -\hat{k})$, so that $4z_m p_R -$

$\theta_L^* = \theta_R^* - 4z_m p_R$. To show that there is a solution of this form, subtract (10) from (9) and note that $p^c(\theta_L^*) = 0$, yielding

$$p^s(\theta_L, \hat{k})(P^s(\hat{k}) + P^s(-\hat{k}) - 1) + (1 - p^s(\theta_L, \hat{k}))(P^s(\hat{k}) + P^s(-\hat{k}) - 1) = 2P^c - 1$$

$$P^s(\hat{k}) + P^s(-\hat{k}) = 2P^c$$

$$1 - \frac{(\theta_L - 4z_M p_R + \hat{k}g - 1)^2 + 4\theta_L}{8\omega} + \frac{(4z_M p_R + \hat{k}g - \theta_R - 1)^2 - 4\theta_R}{8\omega} = 1 - \frac{4z_M p_R}{\omega}.$$

Substituting $\theta_R^* = 8z_m p_R - \theta_L^*$ into the last expression verifies equality. Thus, we may solve for θ_L^* and θ_R^* simply by solving for θ_L^* in Equation (9) or, equivalently,

$$p^s(\theta_L, \hat{k})(1 + P^s(\hat{k})) + (1 - p^s(\theta_L, \hat{k}))P^s(-\hat{k}) - P^c = 0$$

$$\frac{1 - 4z_M p_R + \hat{k}g + \theta_L}{2}\left(1 - \frac{(\theta_L - 4z_M p_R + \hat{k}g - 1)^2 + 4\theta_L}{8\omega}\right) +$$

$$\frac{1 + 4z_M p_R - \hat{k}g - \theta_L}{2}\left(\frac{(\theta_L - 4z_M p_R + \hat{k}g - 1)^2 + 4\theta_L - 32z_M p_R}{8\omega}\right) + \frac{2z_M p_R}{\omega} = 0$$

$$4\omega + (4z_M p_R - \hat{k}g - \theta_L)\left((4z_M p_R - \hat{k}g - \theta_L + 1)^2 + 4\theta_L - 16z_M p_R - 4\omega\right) = 0.$$

$$(13)$$

Denote by $l(\theta_L)$ the left-hand side of (13). It is straightforward to verify that $l(\cdot)$ is continuous and $l(-1 + 4z_M p_R - \hat{k}g) < 0 < l(-1 + 4z_M p_R)$. Further, it is easily shown that $l(\theta_L)$ is increasing for $\theta_L \in (-1 + 4z_M p_R - \hat{k}g, -1 + 4z_M p_R]$. Thus, there is a value of θ_L^* satisfying (13) that is the unique symmetric equilibrium cutoff for party L. ∎

Proof of Comment 1. From the proof of Proposition 1, θ_L^* is characterized by the function $l(\theta_L)$ (13). This function is strictly increasing on $S \equiv (-1 + 4z_M p_R - \hat{k}g, -1 + 4z_M p_R)$ and the solution satisfies $l(\theta_L^*) = 0$.

To show that θ_L^* is decreasing in ω, it is sufficient to show that $\frac{dl}{d\omega} > 0$ for $\theta_L \in S$. Differentiating yields $\frac{dl}{d\omega} = 4 - 4(4z_M p_R - \hat{k}g - \theta_L)$, which is clearly strictly positive on S.

To show that θ_L^* is decreasing in $\hat{k}$, it is again sufficient to show that $\frac{dl}{d\hat{k}} > 0$ for $\theta_L \in S$. Differentiating yields $\frac{dl_4}{d\hat{k}} = -2g(4z_M p_R - \hat{k}g - \theta_L)(4z_M p_R - \hat{k}g - \theta_L + 1) - g[(4z_M p_R - \hat{k}g - \theta_L + 1)^2 + 4\theta_L - 16z_M p_R - 4\omega]$. This is positive if

$$-2(4z_M p_R - \hat{k}g - \theta_L)(4z_M p_R - \hat{k}g - \theta_L + 1) > (4z_M p_R - \hat{k}g - \theta_L + 1)^2$$
$$+ 4\theta_L - 16z_M p_R - 4\omega.$$

The left-hand side is bounded from below by -4 on S, while the right-hand side is bounded from above by -4ω on S, establishing the result. The result for g is derived identically.

To show that θ_L^* is increasing in z_M, it is sufficient to show that $\frac{dl}{dz_M} < 0$ for $\theta_L \in S$. Differentiating yields $\frac{dl}{dz_M} = 8p_R(4z_Mp_R - \hat{k}g - \theta_L)(4z_Mp_R - \hat{k}g - \theta_L - 1) + 4p_R[(4z_Mp_R - \hat{k}g - \theta_L + 1)^2 + 4\theta_L - 16z_Mp_R - 4\omega]$. This is negative if

$$-2(4z_Mp_R - \hat{k}g - \theta_L)(4z_Mp_R - \hat{k}g - \theta_L - 1) > (4z_Mp_R - \hat{k}g - \theta_L + 1)^2$$
$$+4\theta_L - 16z_Mp_R - 4\omega$$

As in the previous case, the right-hand side is bounded from above by -4ω on S, while the left-hand side is non-negative on S, establishing the result. The result for p_R is derived identically.   ■

Notes

1. As an argument for the accumulation of human capital in spoils systems, consider Sorauf (1959: p. 118):

   just as it takes money to make money, it takes political power to achieve greater power. The party long out of office and desperately in need of new reservoirs of strength is precisely the party that, should it suddenly find itself in office, would be least able to use patronage for rebuilding. Weak parties lack the discipline, the trained leadership, and the surplus of potential jobholders to use the system to their maximum advantage.

2. Interestingly, allowing incumbents to "re-politicize" the personnel system would result in frequent switches away from civil service systems in equilibrium.

3. A more natural assumption might be to let g depend on the size of the winning coalition, which would allow small winning coalitions to give more resources to supporters. Most of the results of this model would hold in such an environment. However, this assumption can also create some perverse incentives, since parties would want to minimize the size of their majorities (Riker's "size principle"). Also, larger majorities might help parties to capture more resources or offices to distribute, thus making it possible to maintain patronage levels that are roughly constant in majority size.

4. While we assume that human capital begins at a low level and accumulates at the same rate for both spoils and civil service systems, this is not necessary for our results. The model would make the same predictions under any assumption about the evolution of human capital under the civil service, as long as the civil service promised benefits to all voters evenly in each period.

5. A more general but essentially equivalent assumption: suppose that the winning party can always distribute part of a "dollar", but that the civil service reduces the amount that can be given out for patronage purposes.

6. The equilibrium is also Markov perfect, with states given by $[-\omega, \omega] \times \{c, s\} \times [-1, 1]$.

7. Texas has yet to pass a general civil service law.

8. Pollock (1937: p. 31) writes, "Not the smallest loss under the patronage system is attributable to the inexperience of many government employees, especially in state and local government."

9. These data come from the 1936 Report of the Civil Service Study Commission in Michigan. The turnover rate was slightly higher, approximately 18.6% in the middle and late 1920s, but the authors of the report suggest that this was because the growing economy was drawing people away from the public sector.

10. In describing the change in partisan control of the Rhode Island state government, Maxwell A Devoe, Director, Rhode Island State Department of Civil Service, writes, "In 1933 a Democratic administration took office and held sway for three terms, until 1939. During this period

there was wholesale turnover in public office and for the first time the citizens of the state were thoroughly aroused against the inefficiency and waste of the spoils system (Devoe, 1941)."

11. Some claim that parties gaining control of the government would attempt to limit the inefficiencies by a more gradual turnover in state employees. In discussing state employees in Utah, Durham (1940: p. 25) writes, "The return to power of the opposition party sees virtually a wholesale turnover in state offices. Experience shows that a relatively small number of experienced persons are maintained until the incoming personnel learn the necessary routines. After that, the old hands are either let down gently, or retain, if fortunate, a subordinate position."

12. The date reported in *Civil Service Agencies in the United States and Canada* is the date that civil service agencies were established. In *The Book of the States* (Council of State Governments, 1935) we infer the year of establishment by finding changes in the reports of civil service coverage between the annual volumes.

13. Under the 1935 Social Security Act, the Social Security Board had tried to insist that state welfare and unemployment compensation agencies establish personnel standards, but these were evidently not very effective. In Arkansas, for example, "Despite federal personnel standards, the State Department of Public Welfare became a patronage bonanza. The expansion of government services enlarged the army of public employees, which in turn enhanced the spoils system" (Holley, 1986: p. 294).

14. Using civil service employment data from *The Book of the States* (Council of State Governments, 1935), and the data on total state employment from the *State Distribution of Public Employment*, published by the Bureau of the Census, Folke et al. (2011) calculate the percentage of state employees covered under civil service for those states that enact the reform after 1960. For each state that passed a general civil service law after 1960, on average, prior to the passage of a general civil service law, less than 20% of the state employees were covered by civil service systems. After the passage of such a law, this jumped to an average of more than 60%. Folke et al. (2011) also provide scattered evidence that the states that passed general civil service laws before 1960 also exhibited a substantial increase in the percentage of employees covered under civil service after the reforms were passed.

15. Years were coded as either Republican control of both chambers, Democratic control of both chambers or divided control. The figures in Table 1 are from the point of view of the party that was in control of both chambers for more of the years relative to the other party during the two decades prior to the introduction of the reforms.

16. We should note that Figure 3 includes southern states. If we exclude the south then the pattern becomes even more apparent.

17. A few cities are split across more than one county. In these cases we use the county that contains more than half of the city's area.

Acknowledgements

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