Civil Service Reform, Self-Selection, and Bureaucratic Performance

Daniel Gibbs*

April 22, 2019

Abstract

I use a formal model to analyze the effect of civil service protections on bureaucratic performance. In a repeated two-period model, a public manager observes a bureaucrat's actions for a period and decides whether to retain or attempt to remove the bureaucrat. Bureaucrats vary in terms of their intrinsic motivation and choose between careers in government or the private sector. I show that bureaucratic performance is greater in any equilibrium in which motivated bureaucrats choose government than in all equilibria in which they do not. Stronger civil service protections reduce the amount of effort that motivated bureaucrats must exert to distinguish themselves from their unmotivated peers in order to ensure retention. This strengthens incentives for motivated bureaucrats to choose careers in government. Stronger civil service protections, however, also reduce the ability of public managers to remove unmotivated bureaucrats. These competing effects yield a non-monotonic and discontinuous relationship between civil service protections and bureaucratic performance. This main result explains inconsistencies in the empirical literature on civil service reform. I use the model to analyze recent reforms to U.S. state and federal personnel management that have significantly rolled back traditional job protections.

Keywords: bureaucracy, civil service, public service motivation
JEL Classification: D73, H11, M59, J24

*Ph.D. Candidate, Department of Politics, Princeton University. Email dagibbs@princeton.edu. I thank Charles Cameron, Brendan Cooley, Matias Iaryczower, Janet Kohlhase, Nolan McCarty, seminar participants at the Princeton University Political Economy Colloquium, and conference participants at the 2019 Emory Conference on Institutions and Lawmaking and 2019 Annual Meetings of the Public Choice Society for helpful comments.

Civil service protections typically provide public employees with considerable protection from job dismissal. Public managers must often navigate extensive legal procedures in order to terminate the employment of a bureaucrat. Traditionally justified as a means to prevent politically motivated personnel decisions and patronage, these complex personnel rules present a potential source of government inefficiency. When too rigid, civil service protections impede the ability of public managers to remove bureaucrats who underperform (Osborne and Gaebler 1992; Johnson and Libecap 1994).

Concerns over government efficiency have driven a bipartisan civil service reform movement in the United States that began in the late 1980s inspired by public choice theory and the New Public Management approach to public administration (Suleiman 2003; Kearney and Hays 1998). Broadly, reformers have sought to implement private-sector management techniques in public agencies. At the center of this movement is an effort to drastically weaken traditional civil service protections for government workers. A major reform strategy is the reclassification of traditionally protected bureaucrats as at-will employees who may be dismissed for any reason without warning (Williams and Bowman 2007).

Reforms have been most extensively embraced at the state level. Civil service reform bills passed in Texas (1985), Georgia (1996), Colorado (2003), Kansas (2005), Florida (2001), Indiana (2011), and Arizona (2012) significantly expanded the proportion of at-will state employees and reduced the number of positions classified under traditional civil service protections. Over the course of the 1990s and early 2000s, traditional job protections were curtailed in 28 U.S. states as reform programs were implemented (Hays and Sowa 2007). At the federal level, one of the primary agendas of President Clinton's "National Performance Review" initiative was to give managers greater discretion to hire and fire government employees (Pfiffner 1997). Enthusiasm for more flexible personnel policy in the federal bureaucracy carried over into subsequent administrations. When created in 2002 the Department of Homeland Security adopted a personnel system with weaker civil service protections than the traditional civil service system. In May of 2018, President Trump issued an executive

order that reduced the amount of time employees are granted to demonstrate acceptable performance and removed the requirement that managers use progressive discipline. In addition to this formal reorganization of state and federal personnel systems, governments have increasingly relied on subcontracts over the last three decades to sidestep rigid personnel rules that apply to public employees (Verkuil 2017).

Although this radical transformation of public sector personnel management has received considerable empirical and normative attention, civil service protection reform has largely escaped positive theoretical analysis. Moreover, the empirical literature on reform lacks studies that assess the overall effect of civil service reform on objective measures of bureaucratic performance (Jordan and Battaglio 2014). In this paper I develop a formal model to identify how civil service protections influence bureaucratic performance. I use the results of this model to analyze the effects of radical civil service reform in the United States.

Two ideas are central to my approach. First, a significant body of empirical literature in public administration and political science acknowledges that bureaucrats vary in terms of the degree to which they are intrinsically motivated by public service (Perry 1997; Perry and Hondeghem 2008; Gailmard 2010). In the language of pubic administration, bureaucrats have heterogeneous levels of *public service motivation* (PSM). Left to their own devices, bureaucrats with high PSM voluntarily exert effort and advance the policy goals of the agency. Unmotivated bureaucrats, on the other hand, prefer to exert as little effort as possible. Second, a large literature in public administration (Paarlberg, Perry and Hondeghem 2008; Perry, Hondeghem and Wise 2010; Perry and Hondeghem 2008; Moynihan and Pandey 2007; Vandenabeele 2008; Wright and Grant 2010) and a smaller literature in political science and economics (Gailmard and Patty 2007; Gailmard 2010; Banuri and Keefer 2016; Dal Bo, Finan and Rossi 2013; Valasek 2018; Delfgaauw and Dur 2010) considers both how PSM can be developed within bureaucracies and how citizens with high levels of PSM can be effectively recruited into government. This research is motivated by the idea that a straightforward way to foster quality bureaucratic performance is to staff agencies with intrinsically motivated

bureaucrats.

In the results of the model, the career decisions of motivated bureaucrats are a critical determinant of bureaucratic performance. Bureaucracies perform better when intrinsically motivated bureaucrats self-select into government careers than when they do not. Civil service protections play a crucial role in the career decisions of motivated bureaucrats. In the model, a bureaucrat serves for a period followed by a performance review. At the performance review, a public manager decides whether to retain the bureaucrat or attempt to remove him from the agency.[1] In order to ensure retention, motivated bureaucrats must distinguish themselves from their unmotivated peers. If the amount of effort that the motivated bureaucrats must exert to set themselves apart is too significant, they choose not to pursue careers in government.

Civil service protections influence the amount of effort that motivated bureaucrats must exert prior to review in order to distinguish themselves. Strong civil service protections make it unlikely that a bureaucrat is successfully terminated in the event that his manager tries to remove him. As civil service protections are made more robust, unmotivated bureaucrats become more willing to be identified as unmotivated and thus less willing to exert effort to imitate a motivated bureaucrat. This reduces the amount of additional effort that motivated bureaucrats must expend to distinguish themselves. Civil service protections take this pressure off of motivated bureaucrats which makes a career in government more appealing to these candidates. Motivated agents who initially self-selected out of government under weaker civil service protections can therefore be brought into government under a stronger protection regime.

The overall result is a non-monotonic relationship between the robustness of civil service protections and bureaucratic performance. At low levels of civil service protections, motivated bureaucrats do not self-select into government. At some greater level of protections, motivated types switch into government which results in a discontinuous rise in bureau-

[1]Consistent with convention in the principal-agent literature, I refer to the bureaucrat (agent) with male pronouns and the manager (principal) with female pronouns.

cratic performance. On either side of the discontinuity, bureaucratic performance declines continuously as unmotivated bureaucrats become increasingly difficult to remove.

These results imply that the success of radical reform and the optimal reform strategy depend on the conditions that prevail prior to reform. Locally, small reductions in civil service protections yield overall gains to bureaucratic performance as unmotivated bureaucrats become easier to fire without affecting the career decisions of motivated bureaucrats. Major reforms, on the other hand, can affect whether or not motivated bureaucrats participate in government. If motivated bureaucrats initially choose careers in government, radical reform can force these bureaucrats out of government. This drags down government performance overall. If initially these bureaucrats do not choose government, the overall effect of radical reductions in protections is positive. Such a reform, however, is suboptimal. When motivated bureaucrats do not choose government prior to reform, the optimal reform strategy is to increase the robustness of protections in order to induce motivated types to switch into government careers. Moreover, because bureaucratic performance is always greater when motivated types choose government, a suboptimal policy that grants public employees too much protection outperforms any suboptimal policy that provides too little protection. These results urge caution upon radical reformers who implement organizational change in an uncertain environment.

Related Literature

The paper contributes to three related literatures. First, it adds positive theory to a literature on civil service reform that is primarily empirical. In particular, it examines efficiency arguments for reform directly, bracketing off issues of politicization and patronage that previous scholars have identified as a potential consequence of reform. The non-monotonic relationship that arises from the career decisions of motivated bureaucrats is a novel contribution to this literature. I show that efficiency gains from flexible personnel policy that advocates of

reform point to only lead to overall gains in bureaucratic output locally. Radical reductions in civil service protections may alter the career decisions of desirable job candidates and therefore yield an overall negative effect on bureaucratic performance. Moreover, my results show that an optimal civil service reform strategy may be to increase rather than reduce the robustness of civil service protections.

This theoretical relationship that I identify is of particular value to the civil service protection reform literature given the lack of empirical studies of the overall effect of civil service reform on objective measures of bureaucratic performance (Jordan and Battaglio 2014). More than simply filling a gap in analysis that the empirical scholarship has yet to address, however, my results help explain several inconsistencies in the empirical literature on reform and can serve as a guide to future empirical research. Public administration scholars have studied the effects of at-will reform on employee motivation, employee morale, voluntary turnover, and manager assessments of agency performance. Of these, the only consistently robust finding in the literature is a negative relationship between at-will employment and public employee morale or job satisfaction (Bowman and West 2006; Coggburn 2006; Kellough and Nigro 2002, 2006; Battaglio 2010; Battaglio and Condrey 2009; Sanders 2004; Nigro and Kellough 2000). Employee motivation and turnover have been found to be negatively or insignificantly related to at-will employment(Battaglio 2010; Battaglio and French 2016; Bowman and West 2006; Goodman and French 2011; Gossett 2003). The relationship between manager assessments of agency performance and at-will employment are mixed (Bowman and West 2006; Coggburn 2006; Goodman and Mann 2010; Bowman et al. 2003; Coggburn et al. 2010; Condrey and Battaglio 2007). This literature assumes a continuous and monotonic relationship between civil service protections and morale, motivation, turnover, and performance. The assumption is consistent with the model only for the relationship between morale and civil service protections. For the other three major variables studied in the empirical literature, the career decisions of motivated bureaucrats prior to reform must be specified in order for the model to generate an unambiguous empirical hy-

pothesis. Because empirical studies of reform do not take this into account, the inconsistent findings in this literature should not be surprising in light of the model.

Second, the paper contributes to a literature that studies how the organizational characteristics of bureaucracies endogenously determine employee motivation (Wilson 1989; Perry 1997; Perry and Hondeghem 2008). This literature generally focuses on the way that the work environment directly shapes the risk attitudes, public mindedness, and intrinsic motivation among public employees (Perry, Engbers and Jun 2009; Weibel, Rost and Osterloh 2009; Battaglio and French 2016; Wright 2007; Coyle-Shapiro and Kessler 2003). With respect to civil service reforms, a notable hypothesis in the literature holds that the move to at-will employment may harm employee motivation by making public servants feel less committed to the success of the organization and more vulnerable to arbitrary decisions by managers (Battaglio 2010; Bowman and West 2006; Coggburn 2006; Kellough and Nigro 2006; Goodman and Mann 2010; Roehling and Wright 2004). My model demonstrates that even in the absence of this type of psychological response to new working conditions, civil service reform can change the motivational composition of a workforce by altering the incentives for employees with different fixed levels of motivation to self-select into government.

Third, the paper adds to a small formal literature that addresses civil service protections explicitly (Gailmard and Patty 2007; Ting et al. 2013; Ujhelyi 2014). As in Gailmard and Patty (2007), my model identifies the self-selection of motivated agents into government as a key component in the development of effective agencies. Both models show how the degree of public service motivation among bureaucrats is endogenous to government personnel policies. In their model, service protections provide job security which strengthens the incentives of motivated agents to invest in relationship-specific expertise necessary to effectively implement policy. The job security of motivated bureaucrats is key in this result. I demonstrate the existence of an additional mechanism through which job security induces the participation of motivated bureaucrats in government. In my model, civil service protections relieve motivated bureaucrats of the pressure to exert significant effort to distinguish themselves

from their unmotivated peers. This is accomplished because of the job security offered to *unmotivated* bureaucrats.

Ujhelyi (2014) is the only previous formal welfare analysis of civil service protection reform. The model considers the strategic relationship between a politician who sets policy, a bureaucrat who implements policy, and a voter. Job security weakens bureaucratic performance by allowing bureaucrats to strategically implement bad policies so that voters will replace a politician with different preferences than the bureaucrat. Overall voter welfare, however, may rise with bureaucrat job security. Bad politicians lose the ability to remove good bureaucrats which in turn can induce them to select better policies. The welfare analysis of civil service reform in this paper takes a different approach, focusing on the career decisions of bureaucrats rather than their political concerns. Both models yield a non-monotonic relationship between welfare and job security. Integration of these two approaches is an obvious avenue for future research as this nascent theoretical literature grows.

Model

The actors in the model are a bureaucrat and a manager. In each of an infinite number of periods, a bureaucrat chooses a level of effort $a_t \in \mathbb{R}_+$. This action is observable to the manager and generates a policy payoff for her. After a bureaucrat's first period of employment, the manager chooses whether to retain or fire the bureaucrat. Prior to the manager's decision, the bureaucrat chooses either to stay in government or exit. Denote the bureaucrat's choice $h \in \{0, 1\}$ where $h = 1$ indicates that the bureaucrat stays and $h = 0$ indicates that he exits. A bureaucrat serves at most two consecutive periods and cannot be rehired after he exits or is fired.

In each period the manager's payoff is given by

$$u_t^m = v(a_t)$$

The function $v(\cdot)$ is strictly increasing and concave with $v(0) = 0$. This represents the payoff the manager earns from the everyday execution of policy tasks that the bureaucrat carries out. The manager's utility from policy represents that of the general public or the political principal who selects the policy that bureaucrats pursue in their everyday work.

Two types of bureaucrats exist, *good* and *bad*. With probability $\lambda \in (0, 1)$, a randomly selected bureaucrat is a good type. A bureaucrat's type is his private information. Good types earn a payoff in employment-period t of

$$u_t^g = v(a_t) - c(a_t) + R_G$$

The cost function $c(\cdot)$ is strictly increasing and convex with $c(0) = 0$. The term R_G is the constant difference between the non-policy benefits of office for the good type and an outside option normalized to zero. The good type's policy preferences are congruent with those of the manager. Both prefer greater policy output. The bad type on the other hand receives no payoff from executing the policy tasks of the agency. His payoff in employment-period t is

$$u_t^b = -c(a_t) + R_B$$

To rule out uninteresting cases in which bad types do not seek long-term government employment, I restrict attention in the main text to $R_B > 0$. The manager discounts the future by $\delta \in (0, 1)$. To ease notation I assume that bureaucrats do not discount.[2] The game is repeated with the following sequence of moves:

(1) Nature randomly selects a bureaucrat for employment.

(2) The bureaucrat selects a level of effort a_1 and chooses to stay in government or exit.

(3) If the bureaucrat exits, return to (1).

(4) If the bureaucrat stays, the manager observes a_1 and decides whether to retain or fire the bureaucrat.

[2]Results are fundamentally unchanged if bureaucrats discount.

(5) If the manager chooses to fire the bureaucrat, the game returns to (1) with probability $1-\rho$ and proceeds to (6) with probability ρ.

(6) If the manager chooses to retain the bureaucrat or the bureaucrat is unsuccessfully fired, the bureaucrat selects a level of effort a_2.

(7) Payoffs are realized for the second period and the game returns to (1).

The parameter ρ formalizes the strength of civil service protections. High values of ρ represent robust civil service protections where there is a low probability that a bureaucrat is removed from government if his manager attempts to fire him. For $\rho = 0$, a bureaucrat is employed at will. In this case the manager has full discretion to fire or retain the bureaucrat.

Equilibrium

I restrict attention to pure strategies and define equilibrium to be a perfect Bayesian equilibrium that satisfies the intuitive criterion. Denote the equilibrium actions of good types with (a_1^g, h^g, a_2^g) and of bad types with (a_1^b, h^b, a_2^b). Because $R_B > 0$, exit after one period is a weakly dominated strategy for the bad type. To reduce the number of equilibria, I restrict attention to equilibria in which the bad types always stay.[3]

In any equilibrium, in the final period of employment bad types choose $a_2^b = 0$. Good types choose $a_2^g = \tilde{a}$ where $\tilde{a}$ solves

$$\max_a \quad v(a) - c(a)$$

Let $W \equiv v(\tilde{a}) - c(\tilde{a})$. I focus on the case in which $R_G \geq -W$. When this inequality does not hold, non-policy benefits of office are so low that good types exit after one period in all equilibria. I further assume that good types suffer a cost $k \geq W + R_G$ when employed in government after an unsuccessful termination. This cost reflects policy and psychological loss that good types bear when their manager believes that they are a bad type. In pubic

[3]The results of the model are fundamentally unchanged without this restriction.

agencies, unsuccessfully terminated bureaucrats are often reassigned to low-impact positions or not assigned a position at all. Former patrol officers are assigned to administrative desk jobs for example. In the New York City school district, unsuccessfully terminated teachers are frequently not assigned a class. This assumption ensures that policy-motivated bureaucrats prefer to exit rather than remain with an organization where their supervisors believe they are unmotivated and try to expel them.

I define two classes of equilibria, differentiated by first-period actions. In a *separating equilibrium*, good types exert $a_1^g > 0$, stay, and are retained while bad types exert $a_1^b = 0$, stay, and are fired. In an *exit equilibrium*, good types exert $a_1^g = \tilde{a}$ and exit while bad types exert $a_1^b = 0$, stay, and are fired.

In a separating equilibrium, the manager's ex ante expected payoff when a new bureaucrat is hired is

$$S(\rho) = \frac{\lambda v(a_1^g) + \delta\lambda v(\tilde{a})}{1 - \lambda\delta^2 - (1-\lambda)(1-\rho)\delta - (1-\lambda)\rho\delta^2}$$

Let $\bar{\lambda}$ denote the manager's posterior belief that the first-period is a good type given a_1 and $h = 1$. If $h = 1$, it is a best response for the manager to retain the bureaucrat if and only if

$$\bar{\lambda} v(\tilde{a}) \geq (1-\delta) S(\rho)$$

For a_1^g sufficiently large, it is not incentive compatible for the manager to retain the good type. In this case newly hired good types are so much more productive than retained good types that the principal prefers to hire a random new bureaucrat rather than retain a bureaucrat she knows is a good type. To prevent deviation by the manager from equilibrium when she observes a_1^g and $\bar{\lambda} = 1$, a_1^g must be sufficiently low. In particular, a_1^g must satisfy a *retention constraint*,

$$\frac{v(\tilde{a})}{v(a_1^g)} \geq \frac{\lambda}{1 + \delta\rho(1-\lambda)}$$

Define r such that

$$r \equiv v^{-1}(\frac{v(\tilde{a})[1+\delta\rho(1-\lambda)]}{\lambda})$$

The retention constraint can now be rewritten simply as

$$a_1^g \leq r$$

Note that r is strictly increasing in ρ: as civil service protections become more robust, the manager becomes more willing to retain a good type. Intuitively, stronger civil service protections make the consequences of potentially hiring a bad bureaucrat to replace a good bureaucrat more severe as the bad bureaucrat becomes more difficult to remove. Similarly, r is decreasing in λ. When the chance of hiring a bad bureaucrat to replace a good bureaucrat declines, the manager becomes more willing to replace the good bureaucrat. Finally, note that $\tilde{a} \leq r$. Whenever the first-period good type exerts the same level of effort as a second-period good type in equilibrium, it is incentive compatible for the manager to retain a good type. In this case first-period good types are no more productive than second-period good types which removes the incentive for the manager to replace a bureaucrat she knows is a good type.

In a separating equilibrium, a_1^g must also be sufficiently high to prevent the bad type from imitating the good type. If the bad type deviates and chooses a_1^g instead of no effort, he is mistaken for a good type and retained. He then earns a payoff in the next period of R_B. Because this imitation costs $c(a_1^g)$, his deviation payoff is $-c(a_1^g) + R_B$. In equilibrium, the bad type exerts no effort and is successfully fired with probability $(1-\rho)$. Accordingly, his equilibrium payoff is ρR_B. Separating equilibrium therefore requires that

$$c(a_1^g) \geq (1-\rho)R_B$$

to prevent deviation by the bad type. Let s be defined such that

$$s \equiv c^{-1}((1-\rho)R_B)$$

This *separation constraint* simplifies to

$$a_1^s \geq s$$

Note that s is decreasing in ρ and that $s = 0$ when $\rho = 1$. As civil service protections become stronger, the bad type has a weaker incentive to avoid an attempted firing. In the extreme case in which he cannot be fired, he has no incentive to exert any effort.

In order to focus analysis on the strategic interaction between good and bad types, I assume that r is sufficiently high such that $r \geq s$ when $\rho = 0$. This assumption brackets off intuitively unappealing cases in which the principal fires a bureaucrat after learning that he is a good type.

In a separating equilibrium, the good type exerts $a_1^g = \max\{s, \tilde{a}\}$. If s is sufficiently low such that $s \leq \tilde{a}$, the good type does not need to exert any additional effort above and beyond his preferred level in order to separate. If $s > \tilde{a}$, the bad type is willing to exert the good type's preferred level of effort and more in order to imitate him and be retained. In this case the good type must exert additional effort above the level that maximizes his first-period utility in order to distinguish himself from the bad type. The minimum amount of effort required to separate is s. Because this level of effort exceeds his preferred level, he chooses s to minimize the cost of separation.

Finally, separating equilibrium requires that the good type prefers to stay in government after one period rather than exit. His equilibrium payoff in the second period is $W + R_G$. In a separating equilibrium, he chooses a_1^g in the first period which gives him a first-period payoff of $v(a_1^g) - c(a_1^g)$. His equilibrium payoff is therefore $v(a_1^g) - c(a_1^g) + W + R_G$.

In order to prevent a deviation to $\tilde{a}$ and exit, the good type's equilibrium payoff must

exceed W. The good type's participation constraint is therefore

$$v(a_1^g) - c(a_1^g) + R_G \geq 0$$

The concavity and continuity of the good type's policy utility imply that there exists a unique interval $[z', z]$ with $0 \leq z' \leq \tilde{a} \leq z$ such that the participation constraint is satisfied if and only if $a_1^g \in [z', z]$. As R_G rises, this interval shrinks as the good type requires a higher policy payoff to encourage his participation in government.

Separating equilibrium therefore requires that $a_1^g \geq s$ and $a_1^g \in [z', z]$. This yields a straightforward condition for the existence of a separating equilibrium, $s \leq z$. The amount of effort required for the good type to separate from the bad type must be less than or equal to the maximum amount of effort the good type is willing to exert in order to be retained.

Proposition 1 (Separating Equilibrium) *The following is an equilibrium if and only if* $s \leq z$*:*

The manager retains the bureaucrat if $\bar{\lambda} v(\tilde{a}) \geq (1-\delta) S(\rho)$ *and fires him otherwise*

$a_1^g = \max\{\tilde{a}, s\}$, $h_1^g = 1$, $a_2^g = \tilde{a}$

$a_1^b = 0$, $h_1^b = 0$, $a_2^b = 0$

On the equilibrium path, $\bar{\lambda} = 1$ *at* $a_1 = a_1^g$ *and* $\bar{\lambda} = 0$ *at* $a_1 = 0$

Off path for $a_1 \in (z', s)$, $\bar{\lambda} < \frac{v(\tilde{a})}{(1-\delta S(\rho))}$. *For* $a_1 \geq s$, $\bar{\lambda} \in [0, 1]$. *For* $a_1 \leq z'$, $\bar{\lambda} = 0$.

In an exit equilibrium, the manager's ex ante expected payoff when a new bureaucrat is hired is

$$E(\rho) = \frac{\lambda v(\tilde{a})}{1 - \lambda\delta - (1-\lambda)(1-\rho)\delta - (1-\lambda)\rho\delta^2}$$

If $h = 1$, it is a best response for the manager to retain the bureaucrat if and only if

$$\bar{\lambda} v(\tilde{a}) \geq (1-\delta) E(\rho)$$

On the equilibrium path, $\bar{\lambda} = 0$ whenever the first-period bureaucrat is a bad type. The

manager therefore has no profitable deviation from an exit equilibrium. Note that the inequality is strictly satisfied for $\bar{\lambda} = 1$. If the manager believes the bureaucrat is a good type, her unique best response is to retain him.

In order for an exit equilibrium to exist, the level of effort required to make the bad type separate must exceed the maximum level of effort the good type is willing to exert. That is, it must be true that $s \geq z$. From the definition of s, any $a_1 > s$ is equilibrium dominated by $a_1 = 0$ for the bad type. If $s < z$, the good type prefers to stay in government and choose $a_1 \in (s, z)$ rather than his equilibrium effort if he is retained after deviation. Exit equilibrium therefore requires that the manager believes the bureaucrat is a bad type with sufficiently high probability when such a deviation occurs. However, because $a_1 > s$ is equilibrium dominated by $a_1^b = 0$ for the bad type, the only reasonable belief that the manager can have under the intuitive criterion when she observes $a_1 \in (s, z)$ is that the bureaucrat is a good type. Her unique best response is to retain the good type given her belief when she observes this deviation. Therefore a profitable deviation always exists from an exit equilibrium for the good type whenever $s < z$.

Proposition 2 (Exit Equilibrium) *The following is an equilibrium if and only if $s \geq z$:*

The manager retains the bureaucrat if $\bar{\lambda} v(\tilde{a}) \geq (1 - \delta) E(\rho)$ and fires him otherwise.

$a_1^g = \tilde{a}$, $h_1^g = 0$, $a_2^g = \tilde{a}$

$a_1^b = 0$, $h_1^b = 1$, $a_2^b = 0$

On the equilibrium path $\bar{\lambda} = 1$ at a_1^b

Off path for $a_1 \in (z', z)$, $\bar{\lambda} < \frac{v(\tilde{a})}{(1-\delta)E(\rho)}$. For $a_1 \in (0, z'] \cup [z, s)$, $\bar{\lambda} = 0$. For $a_1 \geq s$, $\bar{\lambda} \in [0, 1]$.

Propositions 1 and 2 establish that either a separating equilibrium or an exit equilibrium exists depending on the location of s relative to z. In fact a stronger result holds: the equilibria in Propositions 1 and 2 are the *only* pure strategy equilibria that exist.

In principle there may exist separating equilibria in which $a_1^g \neq \max\{\tilde{a}, s\}$ or exit equilibria in which $a_1^g \neq \tilde{a}$. It is straightforward to check that there does not exist an exit

equilibrium in which $a_1^g \neq \tilde{a}$. For any such equilibrium there exists a profitable deviation for the good type from a_1^g and exit to $\tilde{a}$ and exit.

Lemma 1 establishes that there does not exist a separating equilibrium in which $a_1^g \neq \max\{\tilde{a}, s\}$. This result is a consequence of the intuitive criterion. If $s < \tilde{a}$ and $a_1^g \neq \tilde{a}$, the good type strictly prefers to exert $a_1 = \tilde{a}$ ans stay if doing so ensures retention. Because $s < \tilde{a}$, the bad type strictly prefers to play his equilibrium strategy rather than exert $\tilde{a}$ and be retained. Therefore if the manager observes $a_1 = \tilde{a}$, the only reasonable belief under the intuitive criterion is that the bureaucrat is a good type. This creates a profitable deviation for the good type from equilibrium. If $s \geq \tilde{a}$ and $a_1^g > s$, a similar argument establishes that the good type can improve his payoff by exerting $a_1 = s + \epsilon$. The good type strictly prefers such a deviation to his equilibrium strategy if doing so ensures retention. By the definition of s, this action is strictly dominated for the bad type. Therefore under the intuitive criterion, $\bar{\lambda} = 1$ at $a_1 = s + \epsilon$ which creates a profitable deviation for the good type.

Lemma 1 *In all separating equilibria,* $a_1^g = \max\{s, \tilde{a}\}$

Two other classes of pure strategy equilibria may exist. The first of these is an equilibrium in which the good type stays and is fired. Because the good type strictly prefers to exit rather than work in government after an attempted firing, there exists a deviation to $\tilde{a}$ and exit from any such equilibrium for the good type. The second alternative is a pooling equilibrium. Lemma 2 establishes that there does not exist a pooling equilibrium.

Lemma 2 *There does not exist a pooling equilibrium.*

The manager does not learn any new information about the bureaucrat's type after one period in a pooling equilibrium ($\bar{\lambda} = \lambda$ on the equilibrium path). In all equilibria only good types exert effort in the second employment period. Therefore in a pooling equilibrium the manager's expected payoff in the second period of a bureaucrat's employment is $\lambda v(\tilde{a})$. Because both types choose the same level of effort in the first period, the manager earns a

payoff of $v(a_1^g) = v(a_1^b)$ in the first period of a bureaucrat's employment. In order for the manager to be willing to retain the first-period bureaucrat, $v(a_1^g)$ must be less than $\lambda v(\tilde{a})$. That is, good types must exert less than their preferred amount of effort in their first period of employment in order to be retained in equilibrium. Because bad types want to exert as little effort as possible to be retained and good types want to exert $\tilde{a}$, the two types have opposite preferences over the amount of effort they want expend instead of the equilibrium level. Good types want to exert more effort and bad types want to exert less effort if such a deviation from equilibrium still ensures them retention. Therefore if the manager observes some $a_1 \in (a_1^g, \tilde{a}]$ rather than $a_1^g = a_1^b$ as she expects, it is only reasonable under the intuitive criterion for her to believe that it is the good type who deviated. Because $v(\tilde{a}) > v(a_1^g)$, if the manager believes that a bureaucrat is a good type, her unique best response is to retain the bureaucrat. Therefore a profitable deviation from a pooling equilibrium always exists for the good type.

With all alternative pure strategy equilibria ruled out, Propositions 1 and 2 imply Proposition 3.

Proposition 3

If $s > z$, the unique equilibrium is exit.

If $s < z$, the unique equilibrium is separating.

If $s = z$, there exists an exit equilibrium and a separating equilibrium.

Civil Service Reform

Civil service protections affect whether the equilibrium is exit or separating. Civil service reform therefore has the capacity to change the type of equilibrium that prevails and thus discontinuously affect bureaucratic performance.

Lemma 3 *A unique $\hat{\rho}$ exists such that for all $\rho < \hat{\rho}$, the unique equilibrium is exit and for all $\rho > \hat{\rho}$ the unique equilibrium is separating.*

The effect of civil service protections on the cost that the good type must pay to separate drives Lemma 3. With weak civil service protections, a bad type can be retained only if he imitates the good type to make the manager believe he is a good type. As civil service protections become more robust, the connection between the manager's beliefs and the employment status of the bad type becomes weaker. A bureaucrat who is found to be a bad type may keep his job despite the wishes of the manager. Therefore the willingness of the bad type to imitate the good type is decreasing in the robustness of civil service protections. The amount of effort the good type must exert in the first period to distinguish himself from the bad type therefore also decreases as civil service protections are expanded. Lemma 3 identifies a unique level of protections such that for any weaker civil service regime, the cost of separation is higher than that which the good type is willing to pay. Whether or not the good type participates is a significant determinant of bureaucratic performance.

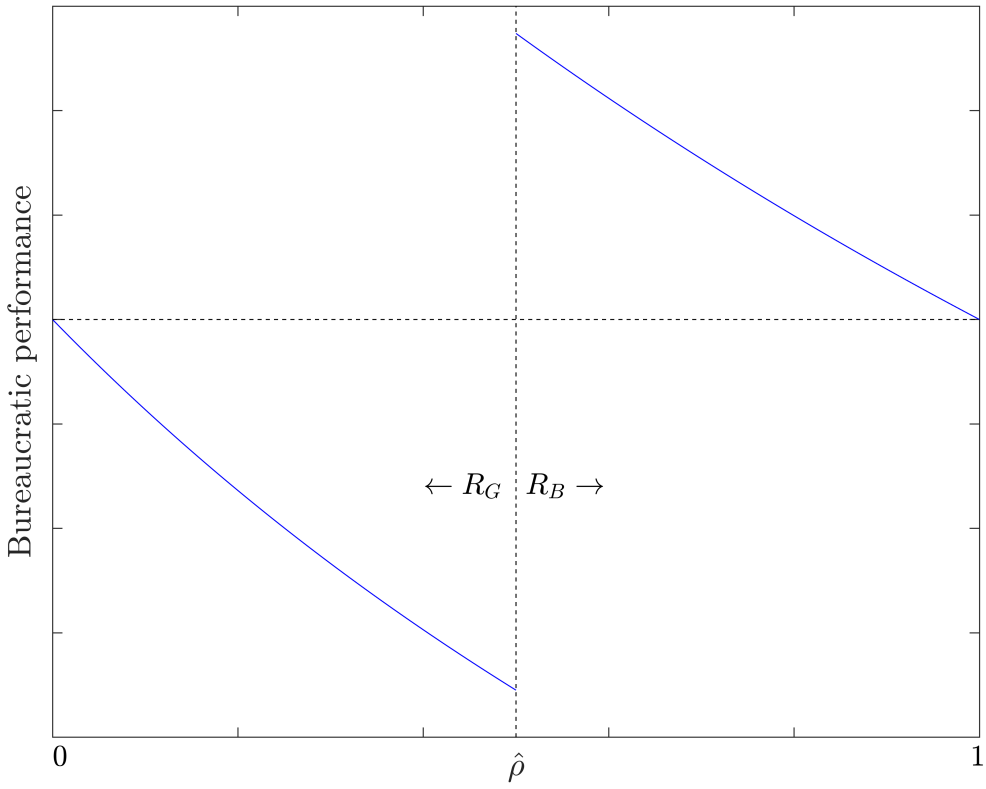
Proposition 4 *The manager's welfare is always greater in a separating equilibrium than in an exit equilibrium. Welfare is maximized in an exit equilibrium at* $\rho = 0$ *and maximized in a separating equilibrium at* $\rho = \hat{\rho}$*. The manager's welfare is strictly decreasing in* ρ *in each type of equilibrium.*

Figure 1 illustrates Proposition 4. For all civil service protection regimes weaker than $\hat{\rho}$, the unique equilibrium is exit. For all regimes stronger than $\hat{\rho}$, the unique equilibrium is separating. Bureaucratic performance is always greater for $\rho > \hat{\rho}$ than $\rho < \hat{\rho}$. On either side of the discontinuity in performance, however, stronger civil service protections lower bureaucratic performance. In either type of equilibrium, a reduction in civil service protections raises the probability that bad types can be successfully removed. This leads to an improvement in bureaucratic performance.

In a separating equilibrium, a reduction in civil service protections has an additional positive effect on agency performance. With weaker protections good types must work harder to distinguish themselves from bad types. Therefore as long as the amount of additional effort

that he must exert to separate does not exceed z, weaker protections yield higher expected agency output than stronger protections.

Figure 1: Civil service protections and bureaucratic performance



The effect of civil service reform, therefore, depends on the type of equilibrium that initially prevails and the extent of the reform. If the bureaucracy is initially unable to retain good types, a reduction in civil service protections does nothing to encourage good types to stay. The reform does, however, make it easier for bad types to be removed from the agency which enhances agency performance continuously and monotonically. An increase in civil service protections, on the other hand, has a continuous and negative effect on agency output for precisely the same reason. A sufficiently large increase in civil service protections, however, induces a transition to separating equilibrium which results in a discontinuous and strictly positive overall rise in agency performance.

If the equilibrium is initially separating, a reduction in civil service protections makes bad types easier to fire and good types work harder to separate. Both effects result in a continuous rise in bureaucratic performance. However, if the reduction in protections is too severe, too much pressure is placed on good types to distinguish themselves from the bad types. In this case they self-select out of the bureaucracy. This results in an overall decline in bureaucratic performance.

Reformers are typically aware of and cite the direct welfare effects associated with the capacity of managers to remove unmotivated bureaucrats from an agency. Calls for reform generally follow from the conclusion that a particular agency is occupied by too many bad agents. The appeals of reformers are typically accompanied by reports that surround the difficulties associated with the removal of bad public servants. Although reduced civil service protections make it easier to fire unmotivated bureaucrats and therefore remove a source of inefficiency, the results of the model reveal that it not obvious that such a policy is optimal. The optimal reform depends on the nature of the actual problem that reformers see manifest as an agency filled with slackers who seemingly cannot be removed. Does the agency appear to be filled with protected bad types because good types self-select out of government service? Or do good types self-select into government but happen be overshadowed by a focus on bad types? If the latter case prevails, small reductions in civil service protections allow bad types to be removed without placing too much additional pressure on good types to stand out. Major reforms, however, can push good types out of the bureaucracy as the pressure to distinguish oneself from one's unmotivated peers in an environment with few protections becomes too burdensome for good types to bear. If the former problem prevails then reformers are better off providing *greater* protections to bureaucrats. This reform allows good types to carry out work they care about in government free of the intense pressure to perform that prevailed under a weaker civil service regime. Good types who were initially turned off of government service because of excessive demands to distinguish themselves are attracted to government by stronger civil service protections.

It is not necessarily always the case that radical reductions in civil service protections drive good types out of the agency. If $\hat{\rho} = 0$, good types are willing to participate in government even without civil service protections. When this happens, at-will employment is optimal and bureaucratic performance is continuously decreasing in ρ. This is only a special case however. Whenever $\hat{\rho} > 0$, at-will employment is a suboptimal civil service arrangement.

Figure 1 illustrates that for $\hat{\rho} > 0$, bureaucratic performance is equivalent under at-will employment ($\rho = 0$) and a system of lifetime appointment in which bureaucrats can never be fired ($\rho = 1$). Under an at-will employment policy, the unique equilibrium is exit. Each type serves only one period after being hired. Good types choose $\tilde{a}$ and exit after one period. Bad types are identified after one period and successfully fired after they produce no policy output. Therefore in each period the good type's expected payoff is $\lambda v(\tilde{a})$. Under lifetime appointment, the unique equilibrium is separating. Both types serve two periods. Because they cannot be fired, both types choose their preferred level of effort in both periods. Ex ante, the manager's expected payoff in each period is $\lambda v(\tilde{a})$. Neither policy extreme, therefore, outperforms the other.

Proposition 5 *$\hat{\rho}$ is weakly increasing in R_B and weakly decreasing in R_G.*

Figure 1 illustrates the comparative static results of Proposition 5. The negative effect of R_G on $\hat{\rho}$ is driven by the good type's willingness to participate in government. Relative government wage acts on the good type's participation constraint. As the wedge between the non-policy rewards to office for the good type and his reservation wage increases, government employment becomes more attractive to the good type. Therefore for some $\rho < \hat{\rho}$ where the good type initially chooses to not participate, a higher relative government wage induces the good type to participate. For any of these ρ, this rise in rewards to office and subsequent transition from exit to separating equilibrium leads to an increase in bureaucratic performance.

Conversely, a rise in R_B makes the good type less willing to choose government. As R_B rises, the bad type becomes willing to exert a greater amount of effort to imitate the good type and secure the higher R_B in the second period. The good type must therefore exert greater effort to distinguish himself from the bad type as R_B rises. This lowers his payoff in a separating equilibrium. Stronger civil service protections are necessary to offset this increased competition for second-period employment with bad types.

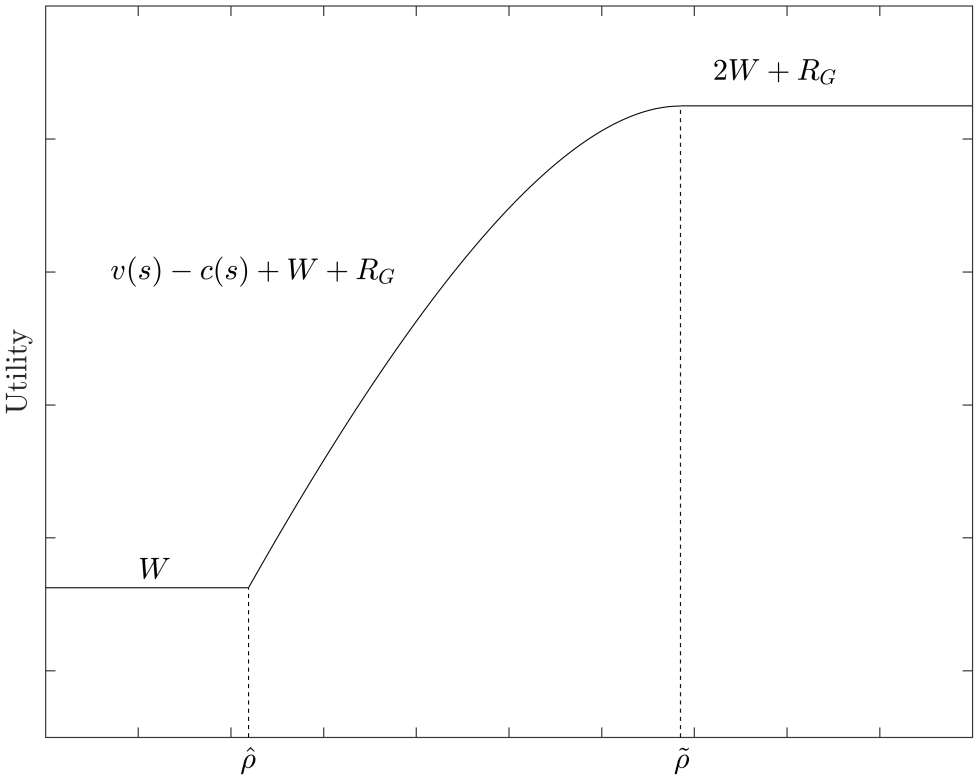
Proposition 6 *Equilibrium expected utility for both types of bureaucrats is increasing in* ρ.

Proposition 6 rationalizes a robust finding in the empirical literature that bureaucrats employed at-will display lower morale and job satisfaction than bureaucrats employed in a traditional civil service system. While both types of bureaucrats are negatively affected by cuts to civil service protections, the mechanism by which their payoff declines is different. In equilibrium, the manager always tries to fire the bad type and never tries to fire the good type. Therefore only the bad type's utility is directly affected by job protections. His expected payoff rises strictly and continuously as his probability of keeping his job after the manager attempts to terminate him rises.

The good type, on the other hand, is only indirectly affected by civil service protections through the bad type's willingness to imitate him. Figure 2 illustrates the relationship between the good type's payoff and ρ. For $\rho < \hat{\rho}$, the amount of effort the bad type is willing to exert to imitate the good type is sufficiently high such that the good type is unwilling to exert a high enough level of effort to distinguish himself from the bad type. He therefore exits government and earns a constant payoff of W for all $\rho \in [0, \hat{\rho}]$. As ρ rises, the amount of effort required to separate falls as the bad type becomes less willing to imitate him. For $\rho > \hat{\rho}$, the cost of separation to the good type is low enough to make the payoff from participation in government greater than W. As ρ continues to rise, the amount of effort the good type exerts in a separating equilibrium falls until $\tilde{\rho} \equiv 1 - \frac{c(\tilde{a})}{R_B}$ after which the bad

type becomes unwilling to exert any effort greater than $\tilde{a}$ to imitate good type. For $\rho \geq \tilde{\rho}$, the good type earns constant payoff of $2W + R_G$.

Figure 2: Good type's equilibrium payoff



The indirect effect of civil service protections on the good type's utility from participation is the key mechanism that drives the results of the model. His decision to participate and the effort he exerts when he participates depends on the bad type's willingness to imitate him. Informal theories of civil service protections in the literature similarly recognize the ability of robust civil service protections to induce motivated bureaucrats to seek government employment. These theories, however, focus on a direct mechanism that does not operate in the model. In these alternative accounts, civil service protections offer desirable job candidates more stable employment which raises the expected wage of government employees relative to the private sector (Bowman and West 2006; Battaglio 2010; Moe 2011). Civil

service protections can therefore make government jobs with modest salaries more attractive than at-will jobs in the private sector that pay a higher nominal wage. In the model, however, good types are never fired in equilibrium. Whenever a good type chooses to participate, a rise in ρ has no direct impact on his earnings. The good type's probability of being retained is always one. It is only through the indirect mechanism that government employment becomes more attractive to the good type as ρ rises. Somewhat counterintuitively, the good type benefits from greater civil protections because the bad type's job becomes more secure. As stronger civil service protections extend greater job security to the bad type, the bad type becomes less willing to imitate the good type which reduces the amount of additional effort the good type must exert to distinguish himself.

A consideration of the effects of an alternative reform designed to entice good types to choose careers in government—an increase in government wages—emphasizes the significance of this indirect mechanism. Intuitively, greater pecuniary income should monotonically close the gap between the good type's reservation wage and his payoff from government employment. A simple rise in government wages such that the good type's participation constraint is satisfied should therefore be sufficient to induce the good type to self-select into government.

This intuition correctly identifies the direct effect of wages on the good type's relative payoff to government employment. However, this intuition does not take into account the indirect effect that higher wages have on his participation utility via the bad type's willingness to imitate him. Because good and bad types cannot be differentiated ex ante, both benefit from the higher wage. The higher wage makes the bad type willing to exert greater effort in the first period to imitate the good type than he is willing to exert at a lower wage. This raises the level of effort that the good type must exert to distinguish himself from the bad type. An increase in wages therefore produces simultaneous positive and negative effects on the good type's payoff from government employment.

Discussion

The novel mechanism linking civil service protections to bureaucratic performance I identify provides new theoretical traction for empirical studies of civil service reform. The empirical literature on at-will reform exhibits few consistently robust findings. One of the few consensus findings in the literature is that at-will employment is robustly and negatively correlated with low employee morale (Bowman and West 2006; Coggburn 2006; Kellough and Nigro 2002, 2006; Battaglio 2010; Battaglio and Condrey 2009; Sanders 2004; Nigro and Kellough 2000). Proposition 6 rationalizes this robust empirical relationship.

A more contested relationship in the empirical literature is that between at-will employment and measures of employee motivation. Empirical studies of this relationship report both a negative relationship and an insignificant relationship (Battaglio 2010; Battaglio and French 2016; Bowman and West 2006). A robust positive relationship does not appear in the empirical literature. My results show that at-will reform has a weakly negative effect on whether motivated types select into or out of government. By Proposition 4, if $\rho \leq \hat{\rho}$ prior to reform so that motivated types initially do not choose government, at-will reform has no effect on the good type's employment decision. In this case employee motivation should be the same before and after reform. Conversely, if $\hat{\rho} > 0$ and motivated types self-select into government at some $\rho > \hat{\rho}$, then a switch to at-will employment causes motivated types to exit and therefore negatively affects employee motivation. The model thus implies that two empirical results are possible when employee motivation is regressed on at-will reform: an insignificant relationship or a significant negative relationship. Which of the two is to be expected depends on the self-selection behavior of motivated types prior to reform.

The model similarly accounts for either a negative or null relationship between at-will employment and voluntary turnover depending on the location of ρ with respect to $\hat{\rho}$ prior to reform. Voluntary turnover among government employees is generated in the model when good types exit after one period. A rise in turnover should be observed only if $\rho > \hat{\rho}$ prior to reform. For $\rho < \hat{\rho}$, the move to at-will employment has no consequences for the good type's

employment decision. Like the empirical literature on employee motivation, empirical studies that examine the effects of at-will employment on voluntary turnover are split between those that find a positive relationship and those that find no relationship (Goodman and French 2011; Bowman and West 2006; Gossett 2003). Attention to the initial equilibrium behavior of motivated types can facilitate more precise hypotheses in future empirical studies of civil service reform.

Studies that use objective performance measures to assess the overall effect of at-will reform on bureaucratic performance are currently lacking in the empirical literature (Jordan and Battaglio 2014). In their place, the authors of several studies use public managers' assessments of agency performance as a dependent variable to estimate the effect of civil service reform on agency performance. These studies find mixed results, reporting both positive and negative relationships between this agency performance proxy and at-will employment policies (Bowman and West 2006; Coggburn 2006; Goodman and Mann 2010; Bowman et al. 2003; Coggburn et al. 2010; Condrey and Battaglio 2007). This is unsurprising in light of the results of the model. If the initial employment decisions of motivated types are not taken into account, both a positive and negative empirical relationship between at-will employment and bureaucratic performance are consistent with the model.

The results of the model broadly urge caution upon proposals to radically reform civil service protections. At-will employment is only optimal in a special case where $\hat{\rho} = 0$. This arises only when the reservation wages of good types are sufficiently low relative to those of bad types. In all other cases, at-will employment is a sub-optimal policy. The suboptimality of at-will employment is concerning given the direction of most major civil service reform bills introduced and enacted into law over the course of the past 30 years in the United States.

The efficiency arguments that often motivate radical civil service reforms correctly identify a source of efficiency gains in expediting the removal of ineffective bureaucrats. The model shows, however, that in most cases this positive effect translates to an overall im-

provement in bureaucratic performance only locally. Reform arguments do not anticipate the potentially serious discontinuous negative effect that a move to at-will employment can bring about by inducing motivated bureaucrats to leave government. Similarly, reform arguments rarely consider the possibility that *greater* civil service protections may improve agency performance. A more prudent reform strategy should take into account the non-monotonic and discontinuous relationship between civil service protections and bureaucratic performance. This strategy involves acknowledging that a tradeoff exists between flexible personnel policy and the attractiveness of government employment to desirable candidates. The optimal civil service regime is likely to be somewhere between the extremes of at-will employment and lifetime appointment.

The results of the model also imply that it is better for reformers to err on the side of making civil service protections too robust rather than too weak. This follows from Proposition 4 illustrated in Figure 1. Any civil service protection regime stronger the optimal regime results in greater bureaucratic performance than any regime weaker than the optimal. This result suggests that caution be applied when radical reductions in civil service protections are considered. In an uncertain environment where the optimal level is unknown to policymakers, reforms that extend rather than retract job protections may be preferable.

Finally, it should be noted that the model provides something of a best case for the efficiency argument of reformers. The literature on civil service protection reform emphasizes the potential for at-will employment to foster patronage or political abuse (Bowman 2002; Kearney and Hays 1998). Concerns over patronage echo the rationale for instituting civil service protections in the first place to curtail the spoils system and foster the development of a professional Weberian bureaucracy. Skeptics of reform argue that at-will employment makes government agencies vulnerable to political abuse and have found mixed evidence to support this claim in U.S. states (Bowman and West 2006; Battaglio and Condrey 2009; Bowman et al. 2003). Such politicization of the bureaucracy may undermine the capacity of public sector agencies to effectively carry out their administrative tasks (Lewis 2008;

Suleiman 2003; Carpenter 2001). My model brackets off issues of patronage and politicization. I assume that bureaucrats are hired by the same random process under all civil service protection regimes. Insofar as political abuse occurs more often at lower levels of protections, my model overestimates the level of bureaucratic performance expected where at-will employment policies have been enacted.

Conclusion

I develop this model in order to understand the effect of civil service reform on bureaucratic performance. It is premised on a selection problem that arises when bureaucrats vary in terms of the degree to which they are intrinsically motivated by their work. In order to be retained by their managers, motivated bureaucrats must distinguish themselves from unmotivated bureaucrats. If separation is too burdensome for motivated bureaucrats, they choose not to pursue careers in government. Strong civil service protections reduce the willingness of unmotivated bureaucrats to imitate motivated bureaucrats and therefore make separation less costly to motivated bureaucrats. In this way civil service protections affect the career decisions of motivated bureaucrats. Any civil service reform that affects this decision discontinuously affects the performance of a bureaucracy. At the same time, strong civil service protections negatively affect bureaucratic performance by making unmotivated bureaucrats more difficult to remove. The overall relationship between civil service protections and agency performance is therefore non-monotonic. The empirical literature on reform and the informal theoretical arguments of many reformers, however, treat the relationship as monotonic. This paper's main contribution to scholarly and policy debates on civil service reform is to highlight both this non-monotonic relationship and the importance of intrinsically motivated bureaucrats' career decisions for understanding and predicting the effects of specific reform policies.

Appendix

Proof of Proposition 1: Assume $s \leq z$. The manager's equilibrium strategy is incentive compatible by construction. If the good type exerts a_1^g and stays, he is retained. Because $a_1^g \leq z$, staying is an equilibrium strategy for the good type. If the good type exerts $a_1 \neq \max\{\tilde{a}, s\}$, with $a_1 < s$, the manager believes he is a bad type and fires him. These beliefs survive the intuitive criterion: the bad type strictly prefers to deviate to $a_1 < s$ if doing so results in his retention. Because $a_1^g \leq z$, this deviation makes the good type worse off. Any $a_1 \geq s$ makes the good type weakly worse off for all possible manager beliefs. For the bad type, if he exerts $a_1 \in (0, s)$ the manager believes he is a bad type and fires him, making him worse off than equilibrium. All other deviations make him weakly worse off than equilibrium for all manager beliefs. Therefore equilibrium strategies are incentive compatible if $s \leq z$.

Now assume $s > z$. Because $\tilde{a} \leq z$, $a_1^g = s$. The good type earns less in this equilibrium than he does if he exerts $\tilde{a}$ and exits. Therefore if $s > z$, the equilibrium does not exist. □

Proof of Proposition 2: It is shown in the main text that if $s < z$, an exit equilibrium does not survive the intuitive criterion. Now assume $s \geq z$. The manager's equilibrium strategy is incentive compatible by construction. Any level of effort other than $\tilde{a}$ and exit makes the good type worse off. If the good type exerts some $a_1 \in (z', z)$ and stays, the manager believes he is a bad type and fires him. These beliefs survive the intuitive criterion: because $s \geq z$, both types are better off than in equilibrium if the manager believes they are a high type after $a_1 \in (z', z)$. This deviation makes the good type worse off than in equilibrium. Any deviation outside of (z', z) makes the good type weakly worse off for all possible manager beliefs. For the bad type, after all $a_1 < s$ the manager believes he is a bad type and fires him. No $a_1 \geq s$ can make the bad type better off for any manager beliefs. Therefore if $s \geq z$, an exit equilibrium exists. □

Proof of Lemma 3: Recall that r is defined such that $\frac{v(\tilde{a})}{v(r)} = \frac{\lambda}{1+\rho(1-\lambda)}$ and that s is defined such that $c(s) = (1-\rho)R_B$. Let $r(\rho) \equiv v^{-1}(v(\tilde{a})\frac{1+\rho(1-\lambda)}{\lambda})$ and $s(\rho) \equiv c^{-1}((1-\rho)R_B)$. Both

functions are continuous in ρ by the continuity of their arguments and the continuity of $v(\cdot)$ and $c(\cdot)$. $r(\rho)$ is strictly increasing in ρ: the term $\frac{1+\rho(1-\lambda)}{\lambda}$ is increasing in ρ and $v^{-1}(\cdot)$ is strictly increasing and convex on $(0,1)$. The function $s(\rho)$ is strictly decreasing in ρ: $c^{-1}(\cdot)$ is strictly increasing and concave and $(1-\rho)\delta R_B$ is decreasing in ρ. Note that z' and z are constant in ρ. Because $r(\rho)$ is increasing, $s(\rho)$ is decreasing, and $s(0) \leq r(0)$ by assumption, an equilibrium exists for all ρ.

Now note that $s(1) = 0$. Because $z > 0$ and $s(1) = 0$, by Proposition 3 the unique equilibrium at $\rho = 1$ is separating. If $s(0) < z$, then $s(\rho) < z$ for all $\rho \in (0,1)$ by the continuity and strict monotonicity of $s(\rho)$. Therefore $\hat{\rho} = 0$: for all $\rho > 0$, the unique equilibrium is separating. In this case when $\rho = \hat{\rho}$, the equilibrium is also unique and separating.

Now consider the case when $s(0) \geq z$. By the continuity and strict monotonicity of $s(\rho)$, there exists a unique $\hat{\rho}$ such that $s(\rho) = z$. For all $\rho < \hat{\rho}$, $s(\rho) > z$ and the unique equilibrium is separating by Proposition 3. For all $\rho > \hat{\rho}$, $s(\rho) < z$ and the unique equilibrium is exit. At $\rho = \hat{\rho}$, both a separating and exit equilibrium exist. □

Proof of Proposition 4: The payoff to the manager from hiring a new agent in an exit equilibrium is

$$E(\rho) = \frac{\lambda v(\tilde{a})}{1 - \delta + \delta\rho - \lambda\delta\rho - \rho\delta^2 + \lambda\rho\delta^2}$$

This term is strictly decreasing in ρ and maximized at $\rho = 0$. The best the manager can do in an exit equilibrium is therefore

$$E(0) = \frac{\lambda v(\tilde{a})}{(1-\delta)}$$

In a separating equilibrium, $a_1^g = \max\{\tilde{a}, s\}$. For a given ρ the lowest payoff the manager receives when the first-period bureaucrat is a good type is therefore $v(\tilde{a})$. Her payoff from

hiring a new bureaucrat when this is the case is given by

$$S(\rho) = \frac{\lambda v(\tilde{a}) + \delta\lambda v(\tilde{a})}{1 - \lambda\delta^2 - (1-\lambda)(1-\rho)\delta - (1-\lambda)\rho\delta^2}$$

This expression is strictly decreasing (and convex) in ρ, reaching its minimum at $\rho = 1$. Moreover, for $\rho = 1$, $a_1^g = \tilde{a}$. It is straightforward to check that $E(0) = S(1)$:

$$\frac{\lambda v(\tilde{a})}{(1-\delta)} = \frac{\lambda v(\tilde{a}) + \delta\lambda v(\tilde{a})}{1 - \delta^2}$$

Therefore $E(0) < S(\rho)$ for all $\rho < 1$. Finally, by Lemma 3, a separating equilibrium exists if and only if $\rho \geq \hat{\rho}$. Because $S(\rho)$ is decreasing in ρ, the manager's welfare is maximized at $\hat{\rho}$. □

Proof of Proposition 5.

By Lemma 3, when $s(0) \geq z$, $\hat{\rho}$ uniquely satisfies $s(\hat{\rho}) = z$. Note that $s(\rho) = c^{-1}((1-\rho)R_B)$ is continuous and strictly decreasing in ρ and continuous and strictly increasing in R_B. Therefore as R_B rises, $\hat{\rho}$ must also rise to restore equality between $s(\hat{\rho})$ and z.

If $s(0) < z$, then $\hat{\rho} = 0$. As R_B rises, by the continuity and monotonicity of $s(\rho)$ in R_B, there exists a unique R_B' such that $c^{-1}(R_B')$. Because $s(0) < z$ for all $R_B < R_B'$, $\hat{\rho}$ is constant in R_B until R_B'. For all $R_B > R_B'$, $\hat{\rho}$ is increasing in R_B as established by the above argument. Therefore $\hat{\rho}$ is weakly increasing in R_B.

Recall that $v(z) - c(z) + R_G = 0$. As R_G rises, z also rises strictly and continuously. Because $s(\hat{\rho}) = z$ when $s(0) > z$, as z rises, $\hat{\rho}$ must fall to reestablish equality. If $s(0) \leq z$, then $\hat{\rho} = 0$ and a further rise in z leaves $\hat{\rho}$ unchanged. Therefore $\hat{\rho}$ is weakly decreasing in R_G. □

References

Banuri, Sheheryar and Philip Keefer. 2016. "Pro-social Motivation, Effort and the Call to Public Service." *European Economic Review* 83:139–164.

Battaglio, R. Paul. 2010. "Public Service Reform and Motivation: Evidence from an Employment-at-will Environment." *Review of Public Personnel Administration* 30(2):341–363.

Battaglio, R. Paul and P. Edward French. 2016. "Public Service Motivation, Public Management Reform, and Organizational Socialization." *Public Personnel Management* 45(2):123–147.

Battaglio, R. Paul and Stephen E. Condrey. 2009. "Reforming public management: Analyzing the impact of public service reform on organizational and managerial trust." *Journal of Public Administration Research and Theory* 19(4):689–707.

Bowman, James S. 2002. "At-Will Employment in Florida Government: A Naked Formula to Corrupt Public Service." *Journal of Labor and Society* 6(2):90–102.

Bowman, James S. and Jonathan P. West. 2006. "Ending Civil Service Protections in Florida Government: Experiences in State Agencies." *Review of Public Personnel Administration* 26(2):139–157.

Bowman, James S., Marc G. Gertz, Sally C. Gertz and Russell L. Williams. 2003. "Civil Service Reform in Florida State Government: Employee Attitudes 1 Year Later." *Review of Public Personnel Administration* 23(4):286–304.

Carpenter, Daniel. 2001. *The Forging of Bureaucratic Autonomy: Reputations, Networks, and Policy Innovation in Executive Agencies, 1862-1928*. Princeton: Princeton University Press.

Coggburn, Jerrell D. 2006. "At-will employment in government: Insights from the state of Texas." *Review of Public Personnel Administration* 26(2):158–177.

Coggburn, Jerrell D., R. Paul Battaglio, James S. Bowman, Stephen E. Condrey, Doug Goodman and Jonathan P. West. 2010. "State Government Human Resource Professionals' Commitment to Employment at Will." *The American Review of Public Administration* 40(2):189–208.

Condrey, Stephen E. and R. Paul Battaglio. 2007. "A return to spoils? Revisiting radical civil service reform in the United States." *Public Administration Review* 67(3):425–436.

Coyle-Shapiro, Jacqueline A.-M. and Ian Kessler. 2003. "The employment relationship in the UK public sector: A psychological contract perspective." *Journal of Public Administration Research and Theory* 13(2):213–230.

Dal Bo, Ernesto, Frederico Finan and Martin Rossi. 2013. "Strengthening State Capabilities: The Role of Financial Incentives in the Call to Public Service." *The Quarterly Journal of Economics* 128(3):1169–1218.

Delfgaauw, Josse and Robert Dur. 2010. "Managerial Talent, Motivation, and Self-selection into Public Management." *Journal of Public Economics* 94(9-10):654–660.

Gailmard, Sean. 2010. "Politics, Principal-Agent Problems, and Public Service Motivation." *International Public Management Journal* 13(1):35–45.

Gailmard, Sean and John Patty. 2007. "Slackers and Zealots: Civil Service, Policy Discretion, and Bureaucratic Expertise." *American Journal of Political Science* 51(4):873–889.

Goodman, Doug and P. Edward French. 2011. "Assessing the Temporary Use of At-will Employment for Reorganization and Workforce Reduction in Mississippi State Government." *Review of Public Personnel Administration* 31(3):270–290.

Goodman, Doug and Stacey Mann. 2010. "Reorganization or political smokescreen: The incremental and temporary use of at-will employment in Mississippi state government." *Public Personnel Management* 39(3):183–209.

Gossett, Charles W. 2003. "The Changing Face of Georgia's Merit System: Results from an Employee Attitude Survey in the Georgia Department of Juvenile Justice." *Public Personnel Management* 32(2):267–278.

Hays, Steven W. and Jessica E. Sowa. 2007. Changes in State Civil Service Systems: A National Survey. Boca Raton: CRC Press pp. 3–23.

Johnson, Ronald N. and Gary D. Libecap. 1994. *The Federal Civil Service System and the Problem of Bureaucracy*. Chicago: University of Chicago Press.

Jordan, Todd and R. Paul Battaglio. 2014. "Are We There Yet? The State of Public Human Resource Management Research." *Public Personnel Management* 43(1):25–57.

Kearney, Richard and Steven Hays. 1998. "Reinventing Government, The New Public Management and Civil Service: The Danger of Throwing the Baby Out with the Bathwater." *Review of Public Personnel Administration* 18(4):38–54.

Kellough, J. Edward and Lloyd G. Nigro. 2002. "Pay for performance in Georgia state government: Employee perspectives on GeorgiaGain after 5 years." *Review of Public Personnel Administration* 22(2):146–166.

Kellough, J. Edward and Lloyd G. Nigro. 2006. "Dramatic reform in the public service: At-will employment and the creation of a new public workforce." *Journal of Public Administration Research and Theory* 16(3):447–467.

Lewis, David. 2008. *The Politics of Presidential Appointments: Political Control and Bureaucratic Performance*. Princeton: Princeton University Press.

Moe, Terry. 2011. *Special Interest: Teachers Unions and America's Public Schools*. Washington: Brookings Institution Press.

Moynihan, Donald P. and Sanjay K. Pandey. 2007. "The Role of Organizations in Fostering Public Service Motivation." *Public Administration Review* 67(1):40–53.

Nigro, Lloyd G. and J. Edward Kellough. 2000. "Civil service reform in Georgia. Going to the edge?" *Review of Public Personnel Administration* 20(3):41–54.

Osborne, David and Ted Gaebler. 1992. *Reinventing Government: How the Entrepreneurial Spirit is Transforming the Public Sector*. Reading, Massachusetts: Addison-Wesley.

Paarlberg, Laurie E., James L. Perry and Annie Hondeghem. 2008. From Theory to Practice: Strategies for Applying Public Service Motivation. In *Motivation in Public Management: The Call of Public Service*, ed. James L. Perry and Annie Hondeghem. Oxford: Oxford University Press pp. 286–293.

Perry, James L. 1997. "Antecedents of Pubilc Service Motivation." *Journal of Public Administration Research and Theory* 7(2):181–197.

Perry, James L. and Annie Hondeghem, eds. 2008. *Motivation in Public Management: The Call of Public Service*. Oxford: Oxford University Press.

Perry, James L., Annie Hondeghem and Lois Recascino Wise. 2010. "Revisiting the Motivational Bases of Public Service: Twenty Years of Research and an Agenda for the Future." *Public Administration Review* 70(5):681–690.

Perry, James L., Trent A. Engbers and So Yun Jun. 2009. "Back to the Future? Performance-Related Pay, Empirical Research, and the Perils of Persistence." *Public Administration Review* 69(1):39–51.

Pfiffner, James P. 1997. "The National Performance Review in Perspective." *International Journal of Public Administration* 20(1):41–70.

Roehling, Mark V. and Patrick Wright. 2004. "Organizationally Sensible vs. Legal-Centric Responses to the Eroding Employment At-Will Doctrine." *Employee Responsibilities and Rights Journal* 16(2):89–103.

Sanders, Robert M. 2004. "GeorgiaGain or GeorgiaLoss? The Great Experiment in State Civil Service Reform." *Public Personnel Management* 33(2):151–164.

Suleiman, Ezra. 2003. *Dismantling Democratic States*. Princeton: Princeton University Press.

Ting, Michael, James Snyder, Shigeo Hirano and Olle Folke. 2013. "Elections and Reform: The Adoption of Civil Service Systems in the U.S. States." *Journal of Theoretical Politics* 25(3):363–387.

Ujhelyi, Gergely. 2014. "Civil Service Reform." *Journal of Public Economics* 86(4):1089–1105.

Valasek, Justin. 2018. "Dynamic Reform of Public Institutions: a Model of Motivated Agents and Collective Reputation." *Journal of Public Economics* 168:94–108.

Vandenabeele, Wouter. 2008. "Government Calling: Public Service Motivation as an Element in Selecting Government as an Employer of Choice." *Public Adminstration* 86(4):1089–1105.

Verkuil, Paul R. 2017. *Value Bureaucracy: The Case for Professional Government*. Cambridge: Cambridge University Press.

Weibel, Antoinette, Katja Rost and Margit Osterloh. 2009. "Pay for performance in the public sector: Benefits and (hidden) costs." *Journal of Public Administration Research and Theory* 20(2):387–412.

Williams, Russell L. and James S. Bowman. 2007. "Civil Service Reform, At-Will Employment, and George Santayana: Are We Condemned to Repeat the Past?" *Public Personnel Management* 36(1):56–77.

Wilson, James Q. 1989. *Bureaucracy: What Government Agencies Do and Why They Do It.* New York: Basic Books.

Wright, Bradly E. 2007. "Public service and motivation: Does mission matter?" *Public Administration Review* 67(1):54–64.

Wright, Bradly E. and Adam M. Grant. 2010. "Unanswered Questions about Public Service Motivation: Designing Research to Address Key Issues of Emergence and Effects." *Public Administration Review* 70(5):691–700.