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Appendixes

Appendix A
Appendix to Chapter 2

This appendix offers a simple model that more formally characterizes the trade-offs facing members of Congress and the president on the issue of patronage. In particular, the model illustrates why the growth of the federal labor force contributed to the adoption of a merit system, why the president was likely to lead efforts to control the volume of patronage, and which members of Congress were most likely to support passage of the Pendleton Act. In generating these results, it will be assumed that individual members of Congress and the president are all vote maximizers.

Following Denzau and Munger (1986) and others, we divide the voting population into two groups: informed and uninformed voters. The former group compares the receipt of government services with taxes levied and, hence, is concerned about the productivity of the federal workforce. In addition, informed voters monitor the voting record of elected officials and keep track of the positions taken by them on various issues. The closer this voting record is to the preferences of the informed voters, the more likely it is that this group of voters will vote in favor of the elected official. In contrast to informed voters, uninformed voters pay no attention to these issues and instead are influenced by campaign advertising, electioneering, canvassing by patronage workers, and, in some cases, the promise of a federal job.

The foregoing discussion suggests a model of vote maximization of the form

$$V = nF(Q, I) + (N - n)H(\alpha W, C). \tag{A1}$$

This equation is designed to capture the behavior of a given member of Congress; a similar model will be constructed for the president. In line with the approach taken by Peltzman (1976), we have two separate probability functions: F is the probability that a member of the informed group votes for the legislator, while H is the probability that a member of the uninformed group votes in favor. The number of informed voters in the legislator's district is denoted by n and the total number of voters by N. The probability that an informed voter grants support is a positive function of the productivity, or performance, of the federal workforce, Q, and the voting record of the legislator, I. In the relevant range, it is assumed that both Q and I are subject to decreasing returns so that

$$F_Q > 0, \quad F_{QQ} < 0, \quad F_I > 0, \quad F_{II} < 0.$$

(Unless specified otherwise, subscripts refer to either partial or, where appropriate, total derivatives.) We also assume that, in the relevant range, Q and I are independent factors in the vote function so that the cross-effects are zero (i.e., $F_{QI} = 0$). While this assumption is not tenable when F approaches unity, most election outcomes in the late 1800s were substantially less than unity, around 0.7. The campaign services rendered by patronage workers are denoted by W, where α is a productivity coefficient. In addition, legislators can devote their own time and resources, C, to campaign activities. Both W and C are assumed to be subject to decreasing returns so that

$$H_W > 0, \quad H_{WW} < 0, \quad H_C > 0, \quad H_{CC} < 0.$$

Although not explicitly included in equation (A1), it is assumed that vote maximization is conditional on the probable reactions of an opponent.

To include explicitly the trade-offs facing an individual member of Congress in bargaining for patronage, we set

$$Q = Q(r, L), \tag{A2}$$

$$I = X - P(\bar{W})W, \tag{A3}$$

$$\alpha = \alpha(m) = \alpha(e/W), \tag{A4}$$

$$C = \bar{e} - e. \tag{A5}$$

Equation (A2) indicates that the productivity of federal workers is a function of two variables, r and L. One of the main objectives of the Pendleton Act was the separation of the civil service into two components: classified (merit) and unclassified (patronage) employees. To account for this delineation, r is defined as the ratio of merit system employees to total federal employment. As explained in the text, productivity differed between patronage and merit workers. Thus, holding the total number of federal workers, L, constant, an increase in r will increase Q (i.e., $Q_r > 0$). In contrast, given the arguments presented in the text on control and increasing organizational size, an increase in L holding r constant should lower productivity (i.e., $Q_L < 0$). These conditions also suggest that expanding the merit system will have a greater effect on productivity the larger is the federal labor force (i.e., $Q_{rL} > 0$).

Because legislators engage in trades with the president for the rights to patronage positions, equation (A3) provides a means for incorporating the costs of obtaining patronage positions into the model. Under the Constitution, it is the president who in general holds the initial rights to allocate patronage. As described in the text, the president would exchange these rights for support on various programs In essence, there is a market for patronage, wherein the president acts as the seller of patronage and members of Congress are the demanders. Within this framework, there is both a quantity and a unit price. Here, the going price for a patronage position, P, can be thought of in terms of roll-call votes promised the president. Although in actual practice this price will likely vary across bills, the purpose here is to incorporate into the model the notion that the president trades patronage for congressional support. Accordingly, we simplify the analysis and assume that there is a single price in terms of roll-call votes that each member of Congress pays in order to buy a patronage position. The price is a function of the total amount of patronage offered by the president, $\bar{W}$, and W is the quantity of patronage purchased by the member of Congress. Since the president is using patronage to buy favorable roll-call votes that he would not otherwise have, and since members of Congress are vote maximizers, these exchanges have their costs to legislators. To illustrate the cost to a legislator of buying patronage, we simplify and assume that each legislator can be thought of as having a preferred roll-call voting record, assumed to be single dimensional, that reflects his or her vote-maximizing position on the issues, absent any trades with the president. This point is denoted as X in equation (A3). When buying patronage, the legislator moves away from that point, with the decline measured by the unit price of patronage times the quantity purchased.

In the text, it was argued that patronage workers had to be monitored else local party officials would exercise control over their activities and the provision of campaign services to the legislator would decline. To incorporate this aspect into the model, let m denote monitoring activity by the legislator, and allow for increases in m to increase the productivity of patronage workers (i.e., $\alpha_m > 0$). Monitoring requires that the legislator devote effort, e, to that activity. How effective each unit of effort is in raising m depends on the number of patronage workers the legislator has; the larger is W, the less effective is each unit of e. These concepts are contained in the definition of α in equation (A4). The opportunity cost for e is embodied within the model via equation (A5). Here, $\bar{e}$ is the legislator's total stock of effort that can be devoted to nonpatronage provided campaign activities, C.

The objective function for the president is very similar to that of a member of Congress and is written as

$$\hat{V} = \sum n\hat{F}(Q, \hat{I}) + \sum(N - n)\, \hat{H}(\hat{\alpha}\hat{W}, \hat{C}). \tag{A6}$$

Here, the ˆ identifies the particular function or variable as referring to the president. With the following exceptions, these variables and functions have the same general purpose and form as those in equation (A1):

(A7) $$\hat{I} = \hat{X} + P(\bar{W})\bar{W},$$

(A8) $$\frac{dP(\bar{W})\bar{W}}{d\bar{W}} = \text{MR}(\bar{W}) = P(\bar{W})(1 + 1/\varepsilon_d),$$

(A9) $$\bar{W} = (1 - r)L - \hat{W}.$$

In equation (A7), the term $P(\bar{W})\bar{W}$ is the total number of roll-call votes obtained by the president in exchange for patronage positions. By exchanging patronage for roll-call votes, the president attains a more preferred policy position, which in turn will increase the support received from informed voters. Since we assume price-taking behavior for each member of Congress, $P(\bar{W})$ is the aggregate inverse demand function for patronage. Thus, $P(\bar{W})\bar{W}$ is analogous to total revenue in standard market analysis, and, as shown in equation (A8), the derivative of $P(\bar{W})\bar{W}$ with respect to $\bar{W}$ yields the marginal revenue function, MR. In turn, MR is a function of the elasticity of demand for patronage, ε_d. Given a negatively sloped demand curve for patronage, the price elasticity will be negative.

A key variable in the president's objective function is $\hat{W}$. As shown in equation (A9), the number of patronage positions that the president chooses to exchange for roll-call votes is equal to the total number of unclassified positions available, $(1 - r)L$, less $\hat{W}$. The latter variable measures the number of patronage positions that the president keeps for his own dispensation. These patronage workers are selected by the president and, as shown in the second term in equation (A6), provide campaign and constituency services that generate direct support for the president. In actual practice, the president can also benefit from having political appointees in the various agencies to monitor and effectuate policy, implying that $\hat{I}$ could be a positive function of $\hat{W}$. The analysis offered here, however, is meant to apply to rank-and-file federal employees, not to high-ranking political appointees, whose selection was and remains largely unaffected by civil service reform. As with members of Congress, the productivity of the president's own patronage workers is a function of his monitoring activity, with $\hat{m}$ equal to $\hat{e}/\hat{W}$.

Consider first the optimization problem faced by the president. Prior to passage of the Pendleton Act, r was equal to zero, leaving the president with the choice variables $\hat{e}$ and $\hat{W}$. Optimizing with respect to these two variables yields the following first-order conditions:

(A10) $$\hat{V}_{\hat{e}} = \hat{H}_{\hat{W}}\alpha_{\hat{m}} - \hat{H}_{\hat{C}} = 0,$$

(A11) $$\hat{V}_{\hat{W}} = \hat{F}_{\hat{I}}(-\text{MR}) + \hat{H}_{\hat{W}}(\hat{\alpha} - \hat{m}\hat{\alpha}_{\hat{m}}) = 0.$$

To reduce the amount of notation, voter population numbers are not shown. Equation (A10) indicates that effort will be devoted to monitoring activity until the marginal returns to effort in the two types of campaign activities are equal. Now consider the implications embodied in equation (A11). The sign of the first term in equation (A11) depends on whether marginal revenue, MR, is positive or negative. If the president could effectively monitor and utilize an unlimited number of patronage workers, $\hat{W}$, the quantity of patronage workers exchanged for roll-call votes, $\bar{W}$, would always be located within the elastic proportion of the demand function. But there are limitations on the president's ability to utilize a large number of patronage workers effectively. Indeed, the description offered in the text suggests a president who was overwhelmed with the problem of managing patronage. Within the context of the model, notice that the term $(\hat{\alpha} - \hat{m}\hat{\alpha}_{\hat{m}})$ in equation (A11) could be negative, with the likelihood of that outcome increasing with increases in $\hat{W}$. Basically, if $\hat{W}$ is too large, there is a loss of control, implying that the per unit decline in productivity dominates the benefits of increasing $\hat{W}$. While the president would prefer to avoid such an outcome, prior to the Pendleton Act the only alternative was an increase in $\bar{W}$, and that would lead to a decrease in the price of patronage. Thus, the optimal choice of $\hat{W}$ could be such that the demand for patronage, $\bar{W}$, is inelastic in the relevant range. Under these conditions, the net benefits derived by the president from patronage will deteriorate if the federal labor force continues to expand.

Before showing why the net benefits from patronage will eventually decline with the growth of the labor force, it is important to emphasize that we are treating L as an exogenous variable. In actual practice, the size of the federal labor force is collectively determined by the president and the Congress. Moreover, elected officials can be expected to have their own preferred level of L that maximizes the number of votes they receive. Increases in demand for government services will likely increase the demand for L, and, when viewed in the aggregate, voter support can increase with the expansion of the labor force. However, the major emphasis of the analysis offered here is on changes in voter support due to changes in the size of the patronage pool, not on the aggregate effect of expanding the size of government.

To show why voter support for the president will eventually decline as the patronage pool expands, evaluate the president's objective function, $\hat{\phi}$, at its optimal values, $\hat{e}^*$ and $\hat{W}^*$, and differentiate with respect to L:

$$\text{(A12)} \qquad \hat{\phi}_L = \hat{F}_Q Q_L + \hat{F}_I \text{MR}.$$

With increases in L, productivity declines, implying that the first term in equation (A12) is negative. The sign of the second term depends on whether MR is positive or negative. If there are limitations on the ability of the president to utilize patronage workers effectively, then $\bar{W}$ must eventually increase as L increases. Since equation (A4) also suggests that there is a maximum number of patronage workers that a member of Congress can effectively handle, there will be a quantity beyond which no additional patronage will be demanded. Given this cutoff point, MR must eventually turn negative. But, if MR turns negative as L expands, the president will not only be confronted with a decline in productivity, a lower Q, but actually desire a smaller patronage pool since that would raise price and increase the returns from exchanging patronage. Thus, sufficiently high levels of L will induce the president to promote civil service reform aimed at reducing the number of patronage positions.

The provisions of the Pendleton Act essentially called for a small increase in r. If MR were negative, the president would gain from implementation of the act. To show this, evaluate the president's objective function at its optimal values, and differentiate with respect to r:

$$\hat{\phi}_r = \hat{F}_Q Q_r + \hat{F}_l(-L\text{MR}). \tag{A13}$$

When MR is negative, both terms in equation (A13) are positive, indicating that the president would gain if the total number of patronage positions were reduced.

Now consider the optimization problem for a member of Congress. Collectively, the members of Congress could, with sufficient support, change r, as they did with the passage of the Pendleton Act. Individually, however, they take r as given and maximize with respect to e and W. The first-order conditions are

$$V_e = H_W \alpha_M - H_C = 0, \tag{A14}$$

$$V_W = -F_l P + H_W(\alpha - m\alpha_m) = 0. \tag{A15}$$

The above conditions are similar to those for the president except that a member of Congress would not obtain more patronage than he or she could effectively manage. That is, the term $(\alpha - m\alpha_m)$ in equation (A15) would not be negative. We have asserted throughout that the demand curve for patronage is negatively sloped. Since the problem is not identical to a standard factor demand analysis, it is noteworthy that the structure of the model does yield a negatively sloped demand curve for patronage. From the envelope theorem (see Silberberg 1990), we know that the following condition must hold:

$$V_{WP} \frac{\partial W^*}{\partial P} > 0. \tag{A16}$$

Here, $\partial W^*/\partial P$ is the slope of the demand curve. From the first-order conditions we obtain

$$V_{WP} = -F_l + F_{ll} P W^* < 0, \tag{A17}$$

implying that the demand curve for patronage is negatively sloped.

As we argue in the text, not only did the growth of the federal labor force have an important effect on the president's willingness to support civil service reform, but it also influenced members of Congress. However, because an increase in L will lower the price of patronage, the incentive to support reform as the labor force expanded was not as strong for members of Congress as it was for the president. To show why, consider the situation prior to the Pendleton Act, where r is equal to zero. Setting e and W at their optimal values, e^*

and W^*, the legislator's objective function, ϕ, can be differentiated with respect to L to yield

(A18) $$\phi_L = F_Q Q_L + F_I \left(\frac{\partial \hat{W}^*}{\partial L} - 1 \right) P_{\overline{W}} W.$$

Because of the negative effect that growth has on productivity, the first term is negative. The second term in equation (A18), however, is positive for the following reasons. First, note that, since the demand curve is negatively sloped, $P_{\overline{W}}$ is negative. Now consider $(\partial \hat{W}/\partial L - 1)$, and recall that equation (A9) reflects both the direct and the indirect effects of a change in L on the quantity of patronage offered to the Congress. The indirect effect accounts for the change in the president's own use of patronage, $\hat{W}$, as L increases (we are assuming that each member of Congress correctly anticipates how the president will react to a change in L). Again using the envelope theorem, we know that the following condition must hold:

(A19) $$\hat{V}_{\hat{W}L} \frac{\partial \hat{W}^*}{\partial L} > 0.$$

From the first-order condition, equation (A11), we obtain

(A20) $$\hat{V}_{\hat{W}L} = \hat{F}_I(-\text{MR}_{\overline{W}}) + \hat{F}_{II}(-\text{MR}^2) > 0.$$

Accordingly, as L expands, the president will increase the amount of patronage that he utilizes in his own campaign, and that action will temper the decline in P. But for the term $(\partial \overline{W}/\partial L - 1)$ in (A18) to be positive, $\partial \hat{W}^*/\partial L$ would have to be greater than unity. Since $\hat{W}$ cannot exceed L, it is not possible for this effect to be greater than unity except in some local area. Thus, in contrast to the results for the president, the price effect of an increase in L can continue to temper the negative effect that the growth of the federal labor force has on productivity even as L gets very large.

Consider now the likelihood that a particular member of Congress will vote for the Pendleton Act. If an increase in r increases support from the electorate, the legislator will vote in favor. Differentiating the legislator's objective function with respect to r yields

(A21) $$\phi_r = F_Q Q_r + F_I \left(\frac{\partial \hat{W}^*}{\partial r} + L \right) P_{\overline{W}} W.$$

Because increasing r will improve productivity, $Q_r > 0$, the first term in the above equation is positive. The second term, however, is negative. Even though the sign of $\partial \hat{W}^*/\partial r$ is negative (with the increase in r due to passage of the Pendleton Act, the president will reduce $\hat{W}$), the magnitude of the change cannot exceed L. Thus, equation (A21) captures the basic trade-off facing members of Congress when voting on the Pendleton Act. Establishing a merit system would increase the productivity of the federal workforce, but it would also decrease the size of the patronage pool, leading to an increase in the price of patronage. Of course, Congress was not monolithic, and the benefits of improving productivity relative to the negative effects of a price increase for patronage will vary across members. For example, in districts where the productivity of the federal labor force, Q is relatively more important to voters, it is more likely that the first term in equation (A21) will dominate the second. The evidence presented in the text indicates that the share of federal output tended to be the highest in the areas where commercial activity was greatest. The quality of federal services, such as postal and customs, was particularly important to voters in those districts. Thus, the importance of Q in the informed-voters probability function would likely increase with increases in the share of federal output in the congressional district.

The above model was also employed in chapter 3 to show why, once having adopted a merit system, the proportion of merit system employees to total employment would expand with increases in total federal employment, why the president would take the lead in expanding merit system coverage, and why there would be continuing conflict between the president and the Congress over patronage issues.

Appendix B

Appendix to Chapter 3

In the text, it is argued that, once having adopted a merit system, the proportion of merit system employees to total employment would expand with increases in total federal employment. In particular, it is argued that the president would be in the vanguard to expand coverage. To show why, recall that, in passing the Pendleton Act, Congress gave the president the authority to expand coverage of the merit system. In effect, the president was given the power to control r, the ratio of merit system workers to total federal civilian employment. Using the same assumptions and notation as in appendix A, recall that the president's objective function is

$$\text{(B1)} \qquad \hat{V} = \sum n\hat{F}(Q, \hat{I}) + \sum (N - n)\, \hat{H}(\hat{\alpha}\hat{W}, \hat{C}).$$

Given the power to control r, the president maximizes support by choosing $\hat{e}$, $\hat{W}$, and r. The first-order conditions are

$$\text{(B2)} \qquad \hat{V}_{\hat{e}} = \hat{H}_{\hat{W}}\hat{\alpha}_{\hat{m}} - \hat{H}_C = 0,$$

$$\text{(B3)} \qquad \hat{V}_{\hat{W}} = \hat{F}_{\hat{I}}(-\text{MR}) + \hat{H}_{\hat{W}}(\hat{\alpha} - \hat{m}\hat{\alpha}_{\hat{m}}) = 0,$$

$$\text{(B4)} \qquad \hat{V}_r = \hat{F}_Q Q_r + \hat{F}_{\hat{I}}(-L\text{MR}) = 0.$$

Equations (B2) and (B3) are the same as before. But now equation (B4) indicates that the ability to control r gives the president the option of placing fed-