Traveling Agents: Political Change and Bureaucratic Turnover in India

Lakshmi Iyer* Anandi Mani†

Online Appendix

1 Politician's Preferences: Details

As described at the beginning of Section 3.2, there are two factors that determine a politician's success in retainining political power – the size of bureaucrats' public good output under his control, as well as overall public good efficiency. Denoting the weight he assigns to these two factors by the parameters λ and $(1-\lambda)$ respectively, the politician seeks to maximize $Z = \lambda \sum_b n_b s_b y_b + (1-\lambda) \sum_b n_b y_b$.[1] Since the subject of this paper is on the interaction between bureaucrats and politicians, we focus on the case where $\lambda = 1$.[2]

*Harvard Business School. Email: liyer@hbs.edu

†University of Warwick. Email: A.Mani@warwick.ac.uk

2 Proof of Proposition 1

We solve for the equilibrium outcome of the first two periods of this game backwards.[3] Let us begin with the politicians' optimal assignment rule that will maximize equation (2) in the paper for a politician of type j, given the number of officers of each type $b = \{H, L_0, L_1\}$. Since $s_H \in (0,1), s_{L_j} = 1$ and $s_{L_{)j(}} = 0$ and $y_H = y_L + \theta$, $\theta \sim U[0,1]$, the optimal assignment rule for important posts is:

1. First assign type H officers for whom $s_H y_H(\theta) > y_L$, which implies that the number of type H officers assigned to important posts in period two, $n_H^I > 0$ irrespective of the type of politician in office.

2. Then assign other important posts to type L_j officers, which implies that $n_{L_j}^I \geq 0$

3. Do not assign those loyal to the other party $(L_{)j(})$ to important posts (since the politician can control none of their output), implying that $n_{L_{)j(}}^I = 0$.

   This assignment rule gives rise to a corresponding probability $q(I\ |b, j)$ of an important post I for an officer of type b when a politician of type j is in office. Without loss of generality, if a politician of type 0 is in office, these probabilities for different types of officers are as follows:

$$q(I\ |H, 0) = \min\{1, \frac{N^I}{(1-\widehat{\theta})(1-F(a^*))B}\} = q(I\ |H, 1) \tag{1a}$$

$$q(I\ |L_0, 0) = \max\{0, \frac{N^I - n_H}{B_0.F(a^*)}\} \tag{1b}$$

$$q(I\ |L_1, 0) = 0 \tag{1c}$$

where $\widehat{\theta}$ is the cutoff value of θ at which $s_H y_H(\widehat{\theta}) \geq y_L$, B_0, B_1 is the number of junior bureaucrats with an ideological leaning 0 and 1 respectively (s.t. $B_0 + B_1 = B$), a^* is the equilibrium level of initial ability above which officers invest in becoming type H in period one and $F(.)$ is the c.d.f. for officer ability a_i. Once important posts have been assigned to *all* type H and L_0 officers as per the optimal assignment rule, there will be no important posts left for type L_1officers. This is because, by assumption, the number of important posts are fewer than the initial number of bureaucrats of either ideology, i.e. $N^I < \min\{B_0, B_1\}$ – and the combined total number of the first two types of officers must exceed B_0.

Let p_j^{win} represent the probability of party j winning power in a given time period.[4] Naturally, officers determining their lifetime utilities take this probability as exogenous to their own career investment decisions. Given the above expressions for officers' probability of getting important posts $q(.)$, we can write U_H and U_L as:

$U_H = \delta(1+\delta)u_{IMP}[p_0^{win}.\ q(I\ |0,H) + p_1^{win}.\ q(I|1,H)]$ and

$U_L = \delta(1+\delta)u_{IMP}[p_0^{win}.\ q(I\ \ |0,L|) + p_1^{win}.q(I\ |1,L)]$

where is δ the per-period discount factor and u_{IMP} represents per-period utility to a bureaucrat from an important post. The components of U_H within square brackets indicate the likelihood of a bureaucrat of type H being assigned to an important post, conditional on a politician of type $j = \{0,1\}$ being in office. The expression for U_L is similar.

Plugging the probabilities $q(.)$ back into equation (1) in the paper and using the expressions for U_H and U_L, we can solve for a^* in period one by imposing equality, as follows:

$$u_{IMP}[p_0^{win}q(I\ |0,H) + p_1^{win}q(I\ |1,H) - p_0^{win}q(I\ |0,L_0)] = c(1,a_i) \tag{2}$$

The right hand side of equation (2) is decreasing in a_i whereas the left-hand side is constant in a_i. As a result, there exists a unique intersection between the LHS and RHS, giving us a unique equilibrium ability level a^*above which all officers invest high effort in expertise in period one. This gives rise to three types of officers. A politician of type j will assign the following number of importants posts to the three types of officers: $n_H^I = (1-\widehat{\theta})(1-F(a^*))B, n_{L_j}^I = N^I - [(1-\widehat{\theta})(1-F(a^*))B]$, $n_{L)j(}^I = 0$

Notes

[1]The implicit assumption here is that a politician's probability of remaining in power is a direct (linear) function of the output he controls. There could be several reasons for this: greater control over output would allow them to direct its allocation strategically towards citizen blocs, so as to maximize their probability of staying in power. Under elections, it could also increase their access to campaign funds.

[2]When $\lambda = 0$, the politician cares about efficiency alone, and bureaucratic assignment by politicians of either party is based solely on officers' productivity. Political change will therefore not trigger bureaucrat transfers. Finally, all our results would still be true for $\lambda \in (0, 1)$, albeit in a weaker manner.

[3]Period three of the game is a repeat of period two, for a given initial assignment of bureaucrats to posts.

[4]We assume that the win probabilities for the two parties are not too far apart. If one party has an exceedingly high win probability, then in equilibrium the politician will not value loyalty, and hence we will not observe politically induced transfers.