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Bureaucrats or Politicians? Comment

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Alberto Alesina and Guido Tabellini (2007) investigate the normative criteria for allocating policy tasks to bureaucrats versus politicians. While they establish criteria with respect to a number of parameters, they do not give a criterion with respect to the level of imperfect monitoring: they write "less monitoring does not favor one or the other type of policymakers (174)," since "[i]mperfect monitoring (high σ_ε^2) reduces effort for both types of policymakers" (Proposition 1 of Alesina and Tabellini). We show that an unambiguous criterion can be established about imperfect monitoring in their model. Specifically, following notation and assumptions of Section II of Alesina and Tabellini, we establish that:

PROPOSITION 1: *There exists a threshold level of imperfect monitoring $\hat{\sigma}_\varepsilon^2 \in [0, \infty)$ such that (i) bureaucrats exert more effort than politicians for any lower level of imperfect monitoring $\sigma_\varepsilon^2 < \hat{\sigma}_\varepsilon^2$, and (ii) politicians exert more effort than bureaucrats for any higher level of imperfect monitoring $\sigma_\varepsilon^2 > \hat{\sigma}_\varepsilon^2$.*[1]

Technically, Proposition 1 does not contradict Proposition 1 of Alesina and Tabellini. While both bureaucrats and politicians exert less effort under more imperfect monitoring, as pointed out by Alesina and Tabellini, our Proposition 1 establishes that there is still a threshold level of imperfect monitoring such that bureaucrats are favored for any lower level of imperfect monitoring and politicians are favored for any higher level of imperfect monitoring.

PROOF: *Since C_a is a strictly increasing function (Alesina and Tabellini 2007, 171), $a^P > a^B$ if and only if $C_a(a^P) > C_a(a^B)$, and $a^P < a^B$ if and only if $C_a(a^P) < C_a(a^B)$. By page 174 of Alesina and Tabellini (2007), in equilibrium we have*

$$C_a(a^B) = \sigma_\theta^2/(\sigma_\theta^2 + \sigma_\varepsilon^2), \tag{1}$$

$$C_a(a^P) = 1/((2\pi)^{1/2}(\sigma_\theta^2 + \sigma_\varepsilon^2)^{1/2}). \tag{2}$$

Consider the function P: $[0, \infty) \rightarrow \mathbb{R}$ defined by

$$P(\sigma_\varepsilon^2) = C_a(a^P) - C_a(a^B) \tag{3}$$

$$= 1/((2\pi)^{1/2}(\sigma_\theta^2 + \sigma_\varepsilon^2)^{1/2}) - \sigma_\theta^2/(\sigma_\theta^2 + \sigma_\varepsilon^2). \tag{4}$$

Since the first term is $O(1/\sqrt{\sigma_\varepsilon^2})$ while the second is $O(1/\sigma_\varepsilon^2)$, $P(\sigma_\varepsilon^2) \geq 0$ for any sufficiently large σ_ε^2. Let $\hat{\sigma}_\varepsilon^2 \in [0, \infty)$ be the minimum of such values of σ_ε^2.[2] Since $\hat{\sigma}_\varepsilon^2$ is the smallest σ_ε^2 such

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[1] At $\hat{\sigma}_\varepsilon^2$, the effort level by politicians is at least the same as the effort level by bureaucrats. Note that $\hat{\sigma}_\varepsilon^2$ may be zero, in which case politicians exert more effort than bureaucrats for any level of imperfect monitoring.

[2] The minimum exists since $P(\cdot)$ is a continuous function and $P(\sigma_\varepsilon^2) \geq 0$ is a weak inequality.

that $P(\sigma_\varepsilon^2) \geq 0$, by definition we have $P(\sigma_\varepsilon^2) < 0$ for all $\sigma_\varepsilon^2 < \hat{\sigma}_\varepsilon^2$. Equivalently, we obtain $C_a(a^P) < C_a(a^B)$, or

$$a^P < a^B \text{ for any } \sigma_\varepsilon^2 < \hat{\sigma}_\varepsilon^2. \tag{5}$$

Differentiating $P(\sigma_\varepsilon^2)$ by σ_ε^2, we obtain

$$\frac{dP(\sigma_\varepsilon^2)}{d\sigma_\varepsilon^2} = (1/\sqrt{2\pi}) \times (-1/2) \times (\sigma_\theta^2 + \sigma_\varepsilon^2)^{-3/2} - \sigma_\theta^2 \times (-1) \times (\sigma_\theta^2 + \sigma_\varepsilon^2)^{-2} \tag{6}$$

$$= (1/2) \times (\sigma_\theta^2 + \sigma_\varepsilon^2)^{-1} \times [-P(\sigma_\varepsilon^2) + \sigma_\theta^2(\sigma_\theta^2 + \sigma_\varepsilon^2)^{-1}]. \tag{7}$$

The following mathematical result proves useful (for exposition, see, for example, Milgrom 2004, 124).

RESULT 1 (Ranking Lemma): *Suppose* $f: \mathbb{R} \to \mathbb{R}$ *is a continuously differentiable function such that* $f(\hat{t}) \geq 0$. *If for all* $t \geq \hat{t}$, $f(t) = 0 \Rightarrow f'(t) > 0$, *then, for all* $t > \hat{t}$, $f(t) > 0$.

Since $P(\sigma_\varepsilon^2) \geq 0$ by definition of $\hat{\sigma}_\varepsilon^2$ and $P(\sigma_\varepsilon^2) = 0 \Rightarrow dP(\sigma_\varepsilon^2)/d\sigma_\varepsilon^2 > 0$ by equation (7), the Ranking Lemma implies $P(\sigma_\varepsilon^2) > 0$ for all $\sigma_\varepsilon^2 > \hat{\sigma}_\varepsilon^2$. Equivalently, we obtain $C_a(a^P) > C_a(a^B)$, or

$$a^P > a^B \text{ for any } \sigma_\varepsilon^2 > \hat{\sigma}_\varepsilon^2. \tag{8}$$

Relations (5) and (8) complete the proof.

REFERENCES

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Milgrom, Paul. 2004. *Putting Auction Theory to Work*. Cambridge: Cambridge University Press.