Lobbyism and Climate Regulation Measures – the Enemy of my Enemy

> "Why do some firms support costly legislation while others continue to oppose?"(Kennard, 2020, p. 188)

This could be observed during the Waxman-Markey Bill (U.S. equivalent to the EU Emission Trading System, EU-ETS, established in 2005) from 2009, which only passed the congress.

It is inverse to the classic scenario described in (Salop and Scheffman, 1983), where larger, more established companies fight their smaller rivals by establishing barriers, or other means despite predatory pricing. Here it is the younger companies with their capital in modern, green machinery, with relatively better cost adaption, who are the "predators".

Regulation Lobby game

1. Initial Phase: companies and policy maker run a price-first menu auction. Companies choose contribution schemes $s_i : [0,R] \to \mathbb{R}_{\geq 0}$ simultaneously. The policy maker then optimizes

$$g(r \mid s_1, s_2, \overline{R}) = \lambda\,\omega(r) + (1-\lambda)(s_1(r) + s_2(r)) \qquad (\star)$$

   with the "ideal" policy $\overline{R}$ and the weight factor λ – both exogenous – which describe the policy maker's behaviour and "ideology".

2. Competition Phase: Cournot market competition. Production quantities Q_1, Q_2 are set. Cost function is set to be $C^i(Q_i) = \frac{r}{\rho_i} Q_i$ with ρ_i the *green capital* of firm i.

Results

1. If $\gamma_1 \overset{df.}{=} 1/\rho_2 - 2/\rho_1 > 0$, i.e. firm 1 got twice the capital than firm 2, then firm 1 will lobby in favour climate regulations, it's optimal quantity and profit given by,[1].

$$Q_i^*(r) = \frac{1}{3}(a + r\gamma_i), \qquad \pi_i^*(r) = \frac{1}{9}(a + r\gamma_i)^2.$$

2. There exists an unique truthful[2] Nash equilibrium, if

$$\lambda > \frac{\gamma_1^2 + \gamma_2^2}{9 + \gamma_1^2 + \gamma_2^2}.$$

where Q_i^* are as above, and for the equilibrium policy r^*:

$$r^* = \frac{\overline{R} - \frac{1}{9} a \beta^{-1}(\gamma_1 + \gamma_2)}{1 - \frac{1}{9}\beta^{-1}(\gamma_1^2 + \gamma_2^2)}.$$

And for the contribution schedules it holds $s_i(r) = \pi_i(r) - \pi_i(r^*) + s_i(r^*)$:

$$s_i(r^*) = \max\left\{\beta\left((\overline{R} - r^*)^2 - (\overline{R} - r_j)^2\right) + \pi_j(r_j) - \pi_j(r^*)\right\},$$

with r_j solution to $(\star)$ with $i \neq j : s_i(r) = 0$ for all r (i.e. taking only one player).

Sources

1. Kennard, A. (2020). The enemy of my enemy: When firms support climate change regulation. International Organization, 74(2), pp. 187–221.
2. Bernheim, B. D. and Whinston, M. D. (1986). Menu Auctions, Resource Allocation, and Economic Influence, The Quarterly Journal of Economics, 101(1), pp. 1–31.
3. Salop, S. C. and Scheffman, D. T. (1983). Raising rivals'costs. The American Economic Review, 73(2), pp. 267–271.
4. Gibbons, R. (1992). A primer in game theory. 1. edition, Wheatsheaf: New York.

---

[1] Assumptions: $\rho_1 > \rho_2$ and $Q_i^*(r), \pi_i^*(r) \geq 0$.

[2] A Nash equilibrium is *truthful*, if all firms' contribution schemes are truthful. This is the case when $\forall i \forall r' \in [0,R]$: $s_i(r') - s_i(r^*) = [\pi_i^*(r') - \pi_i^*(r^*)]_{\geq 0}$ (adapted from Bernheim and Whinston, 1986, p. 12).