Gov 2006: Formal Political Theory II
Section 11

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1. Preview of next week's readings on interest group politics

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    - Grossman & Helpman (1994)

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   - Grossman & Helpman (1994)
2. What makes a "good" formal theory paper?
   - Discuss!
   - Some examples...

Lobbying

- Lobbies can incentivize policy distortions by capturing politicians
- Grossman & Helpman (1994) = seminal model of lobbying over trade protection
- This can be seen as a principal-agent model (with complete information)

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$$U^g(p) - \gamma^g(p),$$

where $U^g(p)$ is g's indirect utility function, and $\gamma^g(p)$ is the per-person lobbying contribution from group g.

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We will allow these contributions to be a function of the policy p implemented by the politician (see below).

Setup: politicians

Assume that there is a single politician in power with utility function

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The parameter a captures how much the politician cares about aggregate welfare. This could be due, for example, to re-election incentives (see Grossman & Helpman, 1996).

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- WLOG, rank groups such that groups $g = 1, ..., G'$ are organized.

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Key assumption: contributions to politicians can be conditioned on the actual policy implemented by the politicians. This is the idea of a **menu auction**.

This is potentially complex because G' groups are choosing schedules (rather than vectors). Nevertheless, the equilibrium of this lobbying game takes a relatively simple form.

Truthful SPNE equilibrium

Theorem

In the lobbying game described above, contribution functions $\{\hat{\gamma}^g(\cdot)\}_{g=1}^{G'}$ *and policy* p^* *constitute a SPNE if:*

1. **Feasibility**: $0 \leq \hat{\gamma}^g(p) \leq U^g(p), \forall g = 1, ..., G'$.
2. **Politician optimization**: *p chosen to maximize utility:*

$$p^* \in \arg\max_p \left(\sum_{g=1}^{G'} \alpha^g \hat{\gamma}^g(p) + a \sum_{g=1}^{G} \alpha^g U^g(p) \right).$$

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Truthful SPNE equilibrium (cont.)

Theorem

3. **No lobby deviation**: *for all* $g = 1, ..., G'$,

$$p^* \in \arg\max_p \left\{ \alpha^g \left[U^g(p) - \hat{\gamma}^g(p) \right] + \sum_{g'=1}^{G'} \alpha^{g'} \hat{\gamma}^{g'}(p) + a \sum_{g'=1}^{G} \alpha^{g'} U^{g'}(p) \right\}. \quad (2)$$

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Condition 3 is the backward induction logic that groups anticipate p and choose $\hat{\gamma}^g(p)$ accordingly: this says that no lobby could increase its utility by offering the government a small increase in contributions

Truthful SPNE equilibrium (cont.)

Theorem

4. **Truthful contributions**: *there exists a policy* p^g *for every lobby* $g = 1, 2, .., G'$ *such that:*

$$p^g \in \arg\max_p \left(\sum_{g'=1}^{G'} \alpha^{g'} \hat{\gamma}^{g'}(p) + a \sum_{g'=1}^{G} \alpha^{g'} U^{g'}(p) \right)$$

and $\hat{\gamma}^g(p^g) = 0$. *That is, the contribution function of each lobby is such that there exists a policy that makes no contributions to the politician, and gives the politician the same utility as* $\hat{\gamma}^g(p^*)$.

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Condition 4 pins down a unique SPNE, namely the best one for groups, by ensuring groups make the minimum payment.

Proof sketch

To see condition 3, suppose that this condition does not hold for lobby $g = 1$, and instead of p^*, some $\hat{p}$ maximizes (2). Let lobby j change its contribution schedule:

$$\alpha^j \hat{\gamma}_j(p) = \sum_{g=1}^{G'} \alpha^g \tilde{\gamma}^g\left(p^*\right) + a \sum_{g=1}^{G} \alpha^g U^g\left(p^*\right)$$
$$- \sum_{g \neq j}^{G'} \alpha^g \tilde{\gamma}^g\left(p\right) - a \sum_{g=1}^{G} \alpha^g U^g\left(p\right) + \epsilon h(p)$$

Following this contribution offer by lobby 1, the politician max its own utility by choosing $p = \hat{p}$ for any $\varepsilon > 0$.

Why? The contribution of lobby j makes up for the loss in utility since the other lobbies change their contributions and they can suffer a loss in utility, plus the government gets an additional $\epsilon h(p)$

Proof sketch (cont.)

To see that this choice is optimal for the politician, the politician would choose policy p that maximizes

$$\begin{aligned} & \alpha^{j}\hat{\gamma}^{1}(p)+\sum_{g\neq j}^{G'}\alpha^{g}\tilde{\gamma}^{g}(p)+a\sum_{g=1}^{G}\alpha^{g}U^{g}(p) \\ = \quad & \sum_{g=1}^{G'}\alpha^{g}\tilde{\gamma}^{g}(p^{*})+a\sum_{g=1}^{G}\alpha^{g}U^{g}(p^{*})+\varepsilon h(p) \end{aligned}$$

Since for any $\varepsilon > 0$ this expression is maximized by $\hat{p}$, the politician would choose $\hat{p}$.

The change in the welfare of lobby 1 as a result of changing its strategy is always positive for small enough ε showing that the original allocation could not have been an equilibrium.

Proof sketch (cont.)

Finally, condition 4 ensures that the lobby is not making a payment to the politician above the minimum that is required.

If this condition were not true, the lobby could reduce its contribution function by a constant, still induce the same behavior, and obtain a higher payoff.

Efficiency implications

Now suppose that contribution functions are differentiable.

Then, it has to be the case that for every policy choice, p^k, within the vector p^*, we must have from the first-order condition of the politician that

$$\sum_{g=1}^{G'} \alpha^g \frac{\partial \hat{\gamma}^g (p^*)}{\partial p^k} + a \sum_{g=1}^{G} \alpha^g \frac{\partial U^g (p^*)}{\partial p^k} = 0, \qquad \forall k = 1, 2, .., K.$$

From the first-order condition of each lobby g that

$$\alpha^g \left(\frac{\partial U^g (p^*)}{\partial p^k} - \frac{\partial \hat{\gamma}^g (p^*)}{\partial p^k} \right) + \sum_{g'=1}^{G} \alpha^g \frac{\partial \hat{\gamma}^{g'} (p^*)}{\partial p^k} +$$

$$a \sum_{g'=1}^{G} \alpha^g \frac{\partial U^{g'} (p^*)}{\partial p^k} = 0, \qquad \forall k = 1, 2, .., K; \forall g = 1, 2, .., G'.$$

Efficiency implications (cont.)

Combining these two first-order conditions, we obtain

$$\frac{\partial \hat{\gamma}^{g}\left(p^{*}\right)}{\partial p^{k}}=\frac{\partial U^{g}\left(p^{*}\right)}{\partial p^{k}}, \qquad \forall k=1,2,..,K;\forall g=1,2,..,G'. \tag{3}$$

Intuitively, at the margin each lobby is willing to pay for a change in policy exactly as much as this policy will bring them in terms of marginal return. (This is an intuition for Condition 3.)

But substituting implies that the equilibrium can be characterized as

$$p^{*}\in \arg\max_{p}\left\{\sum_{j=1}^{G'}\alpha^{g}U^{g}(p)+a\sum_{j=1}^{G}\alpha^{g}U^{g}(p)\right\}.$$

Efficiency implications (cont.)

Interesting parallel between the lobbying equilibrium and the pure strategy equilibria of probabilistic voting models: the lobbying equilibrium can also be represented as a solution to the maximization of a weighted social welfare function, with individuals in unorganized groups receiving weight a and those in organized group receiving weight of $1 + a$.

Intuitively, $1/a$ measures how much money matters in politics, and the more money matters, the more weight groups that can lobby receive. As $a \to \infty$, we converge to the utilitarian social welfare function.

Application: lobbying for tariffs

Grossman and Helpman (1994) apply this idea to lobbying over tariff protection for different industries.

Let us skip the foundations, and note that politicians maximize:

$$\max_p \left\{ aW(p) + \sum_{g \in L} C^g(p) \right\},$$

where L is the set of organized lobbies, $W(p) = \sum_{g=1}^{G} W^g(p)$, and

$$W^g(p) = \ell^g + \Pi^g(p^g) + \alpha^g \sum_{g=1}^{G} (p^g - \pi^g) m^g(p^g) + \alpha^g \sum_{g=1}^{G} S^g(p^g),$$

p^g is the domestic price in industry g, π^g is the world price (making $t^g = p^g - \pi^g$ the tariff), $S^g(p^g)$ is consumer surplus, $m^g(p^g)$ is the quantity of imports, ℓ^g is labor income, and $\Pi^g(p^g)$ are rents associated with sector-specific capital.

Solving out

Assume $C^g(p)$ and $W^g(p)$ are differentiable. Condition 3 yields:

$$\nabla W^g(p^*) - \nabla C^g(p^*) + \sum_{g \in L} \nabla C^g(p^*) + a\nabla W(p^*) = 0, \forall g \in L.$$

Government maximization from equilibrium condition 2 yields:

$$\sum_{g \in L} \nabla C^g(p^*) + a\nabla W(p^*) = 0.$$

Substituting the second into the first yields:

$$\nabla W^g(p^*) = \nabla C^g(p^*), \forall g \in L.$$

After some algebra (check the paper for details)...

Solving out (cont.)

... A neat solution:

$$\frac{t^g}{1+t^g} = \frac{I^g - \sum_{g \in L} \alpha^g}{a + \sum_{g \in L} \alpha^g} \frac{1}{z^g e^g},$$

where I^g is an indicator for g being organized, z^g is import/domestic ratio, and e^g is the import elasticity of demand.

(N.B. this is just a sketch of the proof — see the paper for the gory details!)

Results

- Protection is positive iff a sector is organized
- Protected sectors get more protection when (i) fewer people belong to interest groups and (ii) the policy maker places lower weight on aggregate welfare
- When everyone belows to a special interest group, there is no protection
- Among the protected sectors, sectors with a smaller import penetration ratio and smaller import demand elasticities are more heavily protected

Empirical estimates of a

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Correlation with the Transparency International Corruption Perception Index = 0.67

Empirical estimates of a

TABLE 2. *Countries ranked by their estimates of* a

$a < 1$		$2 < a \leq 1$		$3 < a \leq 5$		$5 < a \leq 10$		$10 < a$	
Nepal	0.06	Thailand	1.06	Indonesia	2.62	Greece	5.11	Finland	10.57
Bangladesh	0.16	Trinidad and Tobago	1.11	India	2.72	South Africa	5.13	France	10.96
Ethiopia	0.17	Morocco	1.14	Phillipines	2.84	Argentina	5.25	Germany	11.55
Malawi	0.25	Ecuador	1.23	Netherlands	2.85	Venezuela	5.41	United Kingdom	11.86
Cameroon	0.30	Egypt	1.24	Malaysia	3.13	Latvia	5.75	Sweden	12.28
Bolivia	0.68	Mexico	1.29	Ireland	3.50	Poland	7.48	Italy	13.42
Pakistan	0.74	Guatemala	1.53	Uruguay	3.62	Colombia	7.88	Turkey	14.53
Kenya	0.86	Costa Rica	1.98	Hungary	3.96	Denmark	8.10	Spain	15.16
Sri Lanka	0.93			Norway	4.22	China	8.33	Korea	16.15
				Chile	4.83	Taiwan	8.53	Brazil	24.91
				Peru	4.85	Austria	8.79	United States	26.14
						Romania	9.25	Japan	37.81
								Singapore	404.00
								Hong Kong	∞

Notes: China, Ethiopia, Hong Kong, and Taiwan are excluded from the remainder of analysis. Only democracies during 1988–96 are included.

From Gawande, Krishna, & Olarreaga (2009).

What makes a "good" formal theory paper?

Discuss!

Things to consider:

- What do formal models give us that other forms of theorizing don't?
- What are the limitations of formal models?
- How do you respond to someone who says: "assumption X is empirically false, so this model is obviously useless" ?
- Which paper from this course did you find the most interesting? Why?

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  - Obvious intuition: bundling issues changes who the decisive voter is
  - But: need to come up with a new solution concept (PUNE) for multidimensional space!

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- Wolton (2019)
    - Obvious intuition: biased media are bad for democracy
    - But: media environment affects politicians' behavior as well as voters' information! Biased media reduces ability to select good types but increases ability to control bad types.