Section 10

Lobbying

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Plan for today

– Quick review of Grossman & Helpman with one lobby.

– More than one lobby.

One lobby, two parties

We have two parties, A and B, a continuum of voters, and a lobby IG.

- A fraction $1-\alpha$ of the voters care about a policy p and a fixed characteristic of the parties. They vote for A iff $u_i(p^A) - u_i(p^B) > \beta_i$, where $\beta_i \sim U[-\frac{b}{f} - \frac{1}{2f}, -\frac{b}{f} + \frac{1}{2f}]$ and $f > 0$ is small.
- A fraction α of the voters is persuaded by campaign expenditures. They vote for A iff $c^A - c^B > \beta_i$, where $\beta_i \sim U[-\frac{b}{h} - \frac{1}{2h}, -\frac{b}{h} + \frac{1}{2h}]$, where $h > 0$ is small.

Timing:

1. IG proposes transfers c^A, c^B conditional on choosing policies $\tilde{p}^A, \tilde{p}^B$.
2. Parties propose policies p^A, p^B.
3. Voters vote. A share s_A of them votes for A.
4. Party A wins with probability $\phi(s_A)$, where $\phi' > 0$, $\phi(0) = 0$, $\phi(1-s) = 1 - \phi(s)$.

We calculate

$$s_A = \frac{1}{2} + b + (1-\alpha)f \int [u_i(p^A) - u_i(p^B)]\, di + \alpha h(c^A - c^B).$$

A wants to win, so it maximizes s_A. B maximizes $s_B = 1 - s_A$.

IG's problem

IG chooses c^A, c^B, p^A, p^B to

$$\begin{aligned} \max\ & \phi(s_A)I(p^A) + (1-\phi(s_A))I(p^B) - c^A - c^B \\ \text{s.t. }\ & s_A(c^A, c^B, p^A, p^B) \geq s_A(0, c^B, p^*, p^B), \\ & s_B(c^A, c^B, p^A, p^B) \geq s_B(c^A, 0, p^A, p^*), \end{aligned}$$

where p^* maximizes the chance of winning, i.e., $\int u_i(p)\, di$.

We can re-write:

$$\begin{aligned} \max\ & \phi(s_A)I(p^A) + (1-\phi(s_A))I(p^B) - c^A - c^B \\ \text{s.t. }\ & (1-\alpha)f\int u_i(p^A)\, di + \alpha h c^A \geq (1-\alpha)f\int u_i(p^*)\, di, \\ & (1-\alpha)f\int u_i(p^B)\, di + \alpha h c^B \geq (1-\alpha)f\int u_i(p^*)\, di. \end{aligned}$$

Both constraints will bind.

Hence we have

$$
\begin{aligned}
c^A &= \frac{(1-\alpha)f}{\alpha h}\left[\int u_i(p^*)\,di - \int u_i(p^A)\,di\right],\\
c^B &= \frac{(1-\alpha)f}{\alpha h}\left[\int u_i(p^*)\,di - \int u_i(p^B)\,di\right].
\end{aligned}
$$

Replacing, we get

$$
\begin{aligned}
s_A &= \frac{1}{2} + b + (1-\alpha)f\int [u_i(p^A) - u_i(p^B)]\,di + \alpha h(c^A - c^B)\\
&= \frac{1}{2} + b + (1-\alpha)f\int [u_i(p^A) - u_i(p^B)]\,di\\
&\quad + \alpha h\left\{\frac{(1-\alpha)f}{\alpha h}\left[\int u_i(p^*)\,di - \int u_i(p^A)\,di\right] - \frac{(1-\alpha)f}{\alpha h}\left[\int u_i(p^*)\,di - \int u_i(p^B)\,di\right]\right\}\\
&= \frac{1}{2} + b.
\end{aligned}
$$

IG's problem is to choose p^A, p^B to maximize

$$
\begin{aligned}
&\phi(s_A)I(p^A) + (1-\phi(s_A))I(p^B) - c^A - c^B \\
&= \phi(s_A)I(p^A) + (1-\phi(s_A))I(p^B) \\
&\quad - \frac{(1-\alpha)f}{\alpha h}\left[\int u_i(p^*)\,di - \int u_i(p^A)\,di\right] - \frac{(1-\alpha)f}{\alpha h}\left[\int u_i(p^*)\,di - \int u_i(p^B)\,di\right] \\
&= \phi(s_A)I(p^A) + (1-\phi(s_A))I(p^B) + \frac{(1-\alpha)f}{\alpha h}\int u_i(p^A)\,di + \frac{(1-\alpha)f}{\alpha h}\int u_i(p^B)\,di - C.
\end{aligned}
$$

The problem is separable: p^A maximizes

$$\phi(s_A)I(p^A) + \frac{(1-\alpha)f}{\alpha h}\int u_i(p^A)\,di$$

and p^B maximizes

$$(1-\phi(s_B))I(p^B) + \frac{(1-\alpha)f}{\alpha h}\int u_i(p^B)\,di.$$

Since $s_A = \frac{1}{2} + b > \frac{1}{2}$, $\phi(s_A) > \phi(s_B)$, and IG weighs more his welfare relative to that of the voters when choosing his request to A compared to B.

Takeaways

1. There is policy divergence. (There isn't without the IG.)
2. The advantaged party proposes a policy closer to IG's ideal point.
3. Both policies are utilitarian optima but lobbying increases the IG's weight.
4. If the election is more competitive (b smaller), there is less distortion.
5. If there are more informed voters (α smaller), there is less distortion.
6. The more informed voters care about the policy relative to fixed characteristics –the "less ideological" they are– (f smaller), less distortion.
7. The more impressionable voters care about campaign spending (h smaller), the more distortion.

Two lobbies, one politician

We saw that electoral incentives induce A's preferences to be represented by

$$s_A = \frac{1}{2} + b + (1-\alpha)f \int [u_i(p^A) - u_i(p^B)]\, di + \alpha h(c^A - c^B).$$

We can represent this by utility function

$$aW(p^A) + c^A + K,$$

where

- $W(p) = \int u_i(p)\, di$ is the social welfare produced by p,
- $a = \frac{(1-\alpha)f}{\alpha h}$, and
- K is a term that A cannot control (so it's a constant from his point of view), and therefore we can ignore.

So, we can model a politician as having utility $G = aW(p) + c$.

Two IGs

We have two IGs, 1 and 2, with utilities $u_i(p) - c_i$ for $i = 1, 2$, where c_i is money they spend on campaign contributions.

Timing:

1. The IGs simultaneously announce contribution schedules $c_i(p)$.
2. The politician chooses a policy p and obtains $aW(p) + c_1(p) + c_2(p)$.

This is qualitatively different from the one-lobby case.

There can be multiple equilibria.

Competition can hurt the lobbies significantly.

Suppose that in equilibrium the politician chooses p^*.

Suppose that there is a policy p' and $c' \geq 0$ such that $u_i(p') - c' > u_i(p^*) - c_i(p^*)$ and $aW(p') + c' + c_j(p') > aW(p) + c_j(p)$ for all p. Then lobby i will choose p' and offer the contribution schedule $c_i(p') = c'$, $c_i(p) = 0$ for all $p \neq p'$.

Hence in equilibrium we have that $p^*, c_i(p^*)$

$$\begin{aligned} &\text{maximize } u_i(p) - c \\ &\text{subject to } aW(p) + c + c_j(p) \geq \max_{\tilde{p}} \{aW(\tilde{p}) + c_j(\tilde{p})\}, \\ &\qquad\qquad c \geq 0. \end{aligned}$$

If that holds for the two lobbies, and p^* maximizes $aW(p) + c_1(p) + c_2(p)$, then it is an equilibrium. This is a necessary and sufficient condition.

This simplifies the problem: each lobby only needs to choose a policy and a contribution level, given the contribution schedule of the other lobby. Lobby i doesn't care about $c_i(p)$ for $p \neq p^*$ as long as $c_i(p)$ is not large enough to tempt the politician to deviate. However, the shape of $c_i(p)$ for $p \neq p'$ matters for the other lobby.

Multiple equilibria

To fix ideas, suppose that $u_i(p) = -(p - x_i)^2$ for voters and IGs. Half voters have ideal policy 1, and half have ideal policy -1. Hence $W(p) = -\frac{1}{2}(p+1)^2 - \frac{1}{2}(p-1)^2 = -p^2 + 1$. So, the politician's ideal point is $p = 0$.

Suppose that there are two lobbies, and they are both right-wing, so $x_1 = x_2 = 1$.

Suppose that contributions are $c_i(p) = c_i^*$ for $p = p^*$, and $c_i(p) = 0$ for $p \neq p^*$.

Equilibrium requires that p^*, c_i^* to

$$\begin{aligned} &\text{maximize } u_i(p) - c \\ &\text{subject to } aW(p) + c + c_j(p) \geq \max_{\tilde{p}}\{aW(\tilde{p}) + c_j(\tilde{p})\}. \end{aligned}$$

The inequality binds, so p^* must maximize $u_i(p) + aW(p) + c_j(p) - \max_{\tilde{p}}\{aW(\tilde{p}) + c_j(\tilde{p})\}$. The last term is constant, so it can be ignored (as long as $c \geq 0$). Hence the condition is that

$$u_i(p^*) + aW(p^*) + c_j^* \geq \max_p\{u_i(p) + aW(p)\}.$$

If p^* maximizes $u_i(p) + aW(p)$ then this works (i.e., p^* is what any of the two lobbies gets if she is alone). So, that p^* and any c_1^*, c_2^* such that $c_1^* + c_2^* = a(W(0) - W(p^*))$ form an equilibrium.

So, they get the same result as if each was alone, but they share the cost.

However, the lobbies can do better. They can achieve p^* as long as

$$u_1(p^*) + aW(p^*) + c_2^* \geq \max_p \{u_1(p) + aW(p)\}$$

$$u_2(p^*) + aW(p^*) + c_1^* \geq \max_p \{u_2(p) + aW(p)\}$$

The "participation constraint" requires $aW(p) + c_i^* + c_j^* = \max_{\tilde{p}}\{aW(\tilde{p}) + c_j(\tilde{p})\} = aW(0)$.

Take $c_1^* = c_2^* = \frac{1}{2}a(W(0) - W(p^*))$ and any p^* such that

$$u_i(p^*) + aW(p^*) + \frac{1}{2}a(W(0) - W(p^*)) \geq u_i(p^i) + aW(p^i),$$

where p^i is the policy chosen by a lobby alone. The LHS is $u_i(p^*) + \frac{1}{2}aW(p^*) + \frac{1}{2}aW(0)$. So, the lobbies can choose p^* to maximize it, and they are better off

If only one lobbies, or they don't coordinate, p maximizes $u_i(p) + aW(p)$, i.e., $-(p-1)^2 + a(-p^2+1)$, so $p = \frac{1}{1+a}$.

The cost in the worst case is $c = a(W(0) - W(p)) = \frac{a}{(1+a)^2}$.

If they coordinate, they can achieve p^* that maximizes $u_i(p) + \frac{1}{2}aW(p)$, i.e., $p^* = \frac{1}{1+\frac{1}{2}a}$.

If they divide the costs, each pays $\frac{1}{2}a(W(0) - W(p^*)) = \frac{\frac{1}{2}a}{(1+\frac{1}{2}a)^2}$. If $a < \sqrt{2}$, the cost is less than in the one-lobby case.

The point of this. There is a coordination problem for the lobbies, and hence there are multiple equilibria.

We want to make predictions. How do we select an equilibrium?

Compensating equilibrium

What Grossman & Helpman do to select an equilibrium (following Bernheim & Whinston) is to assume that the contribution schedules are *compensating*.

This means that, again, p^* and $c_i(p^*)$ (the level of contributions that lobby i gives in equilibrium)

$$\begin{aligned} &\text{maximize } u_i(p) - c \\ &\text{subject to } aW(p) + c + c_j(p) \geq \max_{\tilde{p}} \{aW(\tilde{p}) + c_j(\tilde{p})\}, \\ &\qquad\qquad c \geq 0. \end{aligned}$$

But, then, for all $p \neq p^*$, she sets

$$c_i(p) = \max\{u_i(p) - u_i(p^*) + c_i(p^*), 0\}.$$

This means that she chooses $c_i(p)$ to maintain her utility constant off-equilibrium: $u_i(p) + c_i(p) = u_i(p^*) + c_i(p^*)$, as long as that yields $c_i(p) \geq 0$.

Compensating equilibria are *coalition-proof*, meaning that no subset of agents can deviate together and be all better off. (Is this realistic? I don't know but probably not.)

Equilibrium p^*

Suppose that $c_i(p^*) > 0$. Then $u_i(p) - u_i(p^*) + c_i(p^*) > 0$ for p close to p^* by continuity. Hence, in a neighborhood of the equilibrium, we have $c_i(p) = u_i(p) - u_i(p^*) + c_i(p^*)$.

If $c_i(p^*) > 0$, then the first constraint binds, i.e.,
$aW(p) + c + c_j(p) = \max_{\tilde{p}}\{aW(\tilde{p}) + c_j(\tilde{p})\}$. Hence p^* must maximize

$$u_i(p) + aW(p) + c_j(p) = u_i(p) + aW(p) + u_j(p) - u_j(p^*) + c_j(p^*)$$

if $c_j(p^*) > 0$. So, p^* maximizes

$$aW(p) + u_i(p) + u_j(p).$$

Contributions

How to calculate the contributions? Look at the binding constraints:

$$aW(p^*) + c_i(p^*) + c_j(p^*) = \max_{\tilde{p}}\{aW(\tilde{p}) + c_j(\tilde{p})\},$$
$$aW(p^*) + c_j(p^*) + c_i(p^*) = \max_{\tilde{p}}\{aW(\tilde{p}) + c_i(\tilde{p})\}.$$

Assume that the $\tilde{p}$ that maximize those RHS is such that $c_j(\tilde{p}) > 0$, $c_i(\tilde{p}) > 0$ respectively. Hence $c_j(\tilde{p}) = u_j(\tilde{p}) - u_j(p^*) + c_j(p^*)$ and $c_i(\tilde{p}) = u_i(\tilde{p}) - u_i(p^*) + c_i(p^*)$. Hence the first maximization problem is to max

$$aW(\tilde{p}) + u_j(\tilde{p}) - u_j(p^*) + c_j(p^*).$$

Let p^j be the solution. It maximizes $aW(p) + u_j(p)$. Similarly, let p^i the solution to the second maximization problem. It maximizes $aW(p) + u_i(p)$.

Replacing, we get

$$aW(p^*) + c_i(p^*) + c_j(p^*) = aW(p^j) + u_j(p^j) - u_j(p^*) + c_j(p^*),$$
$$aW(p^*) + c_j(p^*) + c_i(p^*) = aW(p^i) + u_i(p^i) - u_i(p^*) + c_i(p^*).$$

So,

$$c_i(p^*) = a(W(p^j) - W(p^*)) + u_j(p^j) - u_j(p^*),$$
$$c_j(p^*) = a(W(p^i) - W(p^*)) + u_i(p^i) - u_i(p^*).$$

The intuition is that each lobby needs to pay just enough to compensate the politician from not choosing the policy that the other lobby offers when it lobbies alone.

(This will not be always the equilibrium. We still have to check that everything works. Maybe we have $c_i(p^*) = 0$ in equilibrium.)

Example: same bias

Let's continue with our example: $u_i(p) = -(p - x_i)^2$, half the voters have ideal point 1, the other half have ideal point -1.

Suupose that the two lobbies have ideal point 1.

If only lobby i contributes, p^i maximizes $aW(p) + u_i(p) = a(-p^2 - 1) - (p - 1)^2$ so $p^i = \frac{1}{1+a}$.

Hence with two lobbies the equilibrium policy maximizes $aW(p) + u_1(p) + u_2(p) = a(-p^2 - 1) - 2(p - 1)^2$, i.e., $p^* = \frac{1}{1+a/2}$, and the compensating equilibrium satisfies

$$c_1(p^*) = a(W(p^2) - W(p^*)) + u_2(p^j) - u_2(p^*),$$
$$c_2(p^*) = a(W(p^1) - W(p^*)) + u_1(p^i) - u_1(p^*).$$

Replacing, we get

$$c_i(p^*) = \frac{a(1 + a/4)}{(1 + a/2)^2} - \frac{a(1 - a)}{(1 + a)^2}.$$

Together, the two lobbies distort the policy more than if they are alone.

Example: opposite bias

Suppose that one lobby has ideal point 1 and the other has ideal point -1.

If only lobby 1 contributes, p^1 maximizes $aW(p) + u_1(p) = a(-p^2 - 1) - (p-1)^2$ so $p^1 = \frac{1}{1+a}$.

If only lobby -1 contributes, p^{-1} maximizes $aW(p) + u_i(p) = a(-p^2 - 1) - (p+1)^2$ so $p^{-1} = -\frac{1}{1+a}$.

If both contribute, the policy maximizes $aW(p) + u_1(p) + u_{-1}(p)$, so $p^* = 0$. We have

$$c_1(p^*) = a(W(p^1) - W(p^*)) + u_{-1}(p^{-1}) - u_{-1}(p^*),$$
$$c_{-1}(p^*) = a(W(p^{-1}) - W(p^*)) + u_1(p^1) - u_1(p^*).$$

We get

$$c_1(p^*) = c_{-1}(p^*) = \frac{1}{1+a}.$$

Despite the fact that they get the same policy as if they didn't lobby ($p^* = 0$), they need to pay for this outcome, since if one doesn't contribute, the other does and pushes the policy to his side.