Government 2005: Formal Political Theory I

Lecture 12

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Overview

- Political agency and accountability (Besley 2006)
- Cheap talk games (Crawford and Sobel 1982)
  - Politicians and policy advisers

Political accountability

* **Setup**
- Two periods: $t \in \{1, 2\}$
- Politician set policy: $e_t \in \{0, 1\}$
- State of the world: $s_t \in \{0, 1\}$
- Voters' payoff: $\Delta > 0$ if $e_t = s_t$, zero otherwise
- Discount factor (common to politician and voters): $\beta < 1$
- Two types of politician, congruent vs dissonant: $i \in \{c, d\}$, with prior equal to $Prob[i = c] = \pi$
- Both types get E (ego rents) when in office
- c-type also gets Δ when $e_t = s_t$
- d-type also gets r_t when $e_t = 1 - s_t$
  - $r_t \sim G(r)$ in $[0, R]$ with $E(r) = \mu$
  - We assume $R > \beta(\mu + E)$ (we'll see why)
- Hence, politician's strategy: $e_t(s, i)$

Political accountability (contd.)

* **Timing**

1. Nature decides i of incumbent politician and s (both unobserved to voters)
2. Nature draws r_1 from $G(r)$
3. Incumbent decides e_1
4. Voters observe outcome (Δ or zero) and decide whether to reelect the incumbent or to draw a new politician (congruent with probability π)
5. Nature draws r_2 from $G(r)$ and the politician in office decides e_2; payoffs are determined

Political accountability (contd.)

- What are the **PBE** of the model?
- In period 2, we simply have that:
  - $e_2(s, c) = s_2$
  - $e_2(s, d) = 1 - s_2$
- In period 1, we have that:
  - $e_1(s, c) = s_1$ (congruent politician always do what voters want provided they reelect him for doing so)
  - $Prob[e_1(s, d) = s_1] = \lambda$ (index of political discipline of dissonant politician)
- Voters' posteriors:

$$\hat{\pi} = Prob[i = c | e_1 = s_1] = \frac{\pi}{\pi + (1 - \pi)\lambda} \geq \pi$$

$$\hat{\hat{\pi}} = Prob[i = c | e_1 = 1 - s_1] = 0 < \pi$$

- Hence, if Δ observed, incumbent is reelected (sequentially rational behavior by voters)

Political accountability (contd.)

- What's the best response by a dissonant politician? (λ endogenous)
- $e_1 = s_1$ iff $r_1 < \beta(\mu + E)$
- As a result, $\lambda = G(\beta(\mu + E))$
- As we assumed $R > \beta(\mu + E)$, ICC_d is met to sustain separating outcome for at least some dissonant politicians
- What happens if $R \leq \beta(\mu + E)$?
- We have identified PBE:
  - $e_k^*(s, c) = s_k$
  - $e_2^*(s, d) = 1 - s_2$
  - $e_1^*(s, d) = s_1$ if $r_1 < \beta(\mu + E)$
  - $e_1^*(s, d) = 1 - s_1$ if $r_1 \geq \beta(\mu + E)$
  - $\hat{\hat{\pi}} = 0$
  - $\hat{\pi} = Prob[i = c | e_1 = s_1] = \frac{\pi}{\pi + (1-\pi)G(\beta(\mu+E))}$

Political accountability (contd.)

- Are there other PBE?
- No complete pooling on $e_1 = s_1$ is possible (high-rent dissonant politician cannot be convinced by any belief)
- But what about pooling on $e_1 = 1 - s_1$?
- To sustain this equilibrium, we must have: $Prob[i = d | e_1 = s_1] = 1$ off the equilibrium path
- So that the congruent politician is not reelected when playing $e_1 = s_1$
- In this case, $e_1^*(s, c) = 1 - s_1$ iff: $(1 - \beta(1 - \pi))\Delta < \beta E$
- This is another PBE
- It is easy to see, however, that this pooling PBE doesn't survive the **intuitive criterion**

Political accountability (contd.)

* **Welfare analysis**

- $V_1(\lambda) = [\pi + (1-\pi)\lambda]\Delta$
- $V_2(\lambda) = \pi[1 + (1-\pi)(1-\lambda)]\Delta$
- $W(\lambda) = V_1(\lambda) + \beta V_2(\lambda)$
- W increasing in λ
- W increasing in π
- Negative correlation between welfare and political turnover (i.e., $(1-\pi)(1-\lambda)$)
- Comparing V_1 and V_2, positive analysis of term limit: discipline effect vs selection effect

Cheap talk games

- The structure of cheap talk games is the same as that of signaling games:
  1. Nature draws a type t for the sender
  2. The sender observes t and chooses a message m
  3. The receiver observes m (but not t) and chooses an action a
  4. Payoffs $U_S(t, a)$ and $U_R(t, a)$ are determined
- The difference is in the payoffs $\rightarrow$ **the messages sent by the sender do not directly affect the payoffs** of either the sender or the receiver
- Payoffs depend only on the sender's type and the receiver's action
- Cheap talk is really cheap, that is, costless, non-binding, and non-verifiable

Cheap talk games (contd.)

- The payoffs of the sender and receiver must satisfy three necessary conditions in order for cheap talk to be informative:
  1. Different sender types have different preferences over the receiver's actions
  2. The receiver prefers different actions depending on the sender type (same condition in signaling games)
  3. The receiver's preferences over actions are not completely opposed to the sender's preferences
     - The sender and receiver must have some common interests
- We can characterize **pooling** (uninformative) equilibria, as well as **separating** or **partially separating** equilibria (where some information about the sender's type is conveyed)

Cheap talk games (contd.)

- In cheap talk games there is always a pooling (uninformative) equilibrium, in which the messages are ignored by the receiver and all senders send the same message
  - This is sometimes called a “babbling” equilibrium
- The receiver believes that all sender types will send the same message
- Off-equilibrium beliefs must ensure that all sender types send the same message
  - E.g., the receiver believes that, if a sender deviates, she must have an average type
- Then, the message is uninformative and the receiver’s posterior belief is equal to his prior belief
- We have an equilibrium since nobody has an incentive to deviate

Cheap talk games (contd.)

Example 1

- Let's consider the following payoff examples, with two sender types t_L and t_H, and two actions a_L and a_H

	t_L	t_H
a_L	(2,1)	(1,0)
a_H	(0,0)	(0,1)

- Note: This is a payoff matrix but not as a function of player's actions
- The receiver want to play a_L with t_L and a_H with t_H
- However, type-L and type-H *both* prefer the action a_L to the action a_H
- So, both senders want to send the message $t = t_L$
- The receiver cannot believe the t_L sender's message
- The first condition discussed above is violated

Cheap talk games (contd.)

Example 2

	t_L	t_H
a_L	(0,1)	(1,0)
a_H	(2,0)	(0,1)

- The preferences of the sender and receiver are diametrically opposed
  - When the sender's type is L, the sender prefer the action a_H but the receiver prefers a_L
  - When the sender's type is H, the sender prefer the action a_L but the receiver prefers a_H
- The sender always wants the receiver to be deceived about his type
- So, the receiver cannot believe the sender's message
- The third condition discussed above is violated

Cheap talk games (contd.)

Example 3

	t_L	t_H
a_L	(2,1)	(0,0)
a_H	(0,0)	(1,1)

- The preferences of the sender and receiver are **perfectly aligned**, and the sender can truthfully reveal his type
- Denote q and p as the belief that a high type sent the message $m(t_L)$ and $m(t_H)$, respectively
- The following is a perfect Bayesian equilibrium: $[(m(t_L), m(t_H)), (a(m(t_L)), a(m(t_H))), (q(m(t_L)), p(m(t_H)))] = [(t_L, t_H), (a_L, a_R), (0, 1)]$
- All conditions discussed above are met

Politicians and policy advisers

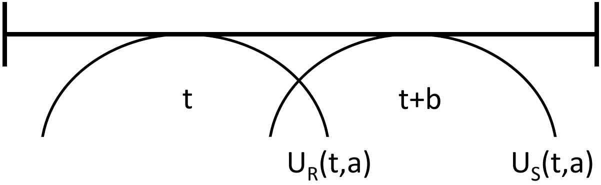
- Let's consider a more general cheap talk model with a continuum of types/messages
- A politician/decision-maker (the receiver) must choose a policy (the action) from the interval $[0, 1]$
- An expert/adviser (the sender) has information about what the best policy is
- The adviser does not have exactly the same preferences of the politician—rather, the adviser always prefers policies that are slightly higher

Politicians and policy advisers (contd.)

- More precisely, the sender's type is t and $t \sim U[0,1]$
- An alternative way to see this game is that t is the state of the world, which the expert learns about
- Denote the policy chosen by the politician as a
- The politician's payoff is $-(a-t)^2$
- The adviser's payoff is $-(a-t-b)^2$, where $b \geq 0$
- Then, t is the bliss point of the politician, and $t+b$ the bliss point of the adviser
- If the sender's type is t, then the sender has received private information about the best policy for each player

Politicians and policy advisers (contd.)

- When the sender's type is t, the politician has quadratic preferences with ideal point at t, and the adviser has quadratic preferences with ideal point at $t + b$, as depicted below



- The larger is b, the greater is the adviser's "bias" in favor of higher policies
- When b is close to 0, then the interests of the politician and the adviser are closely aligned

Politicians and policy advisers (contd.)

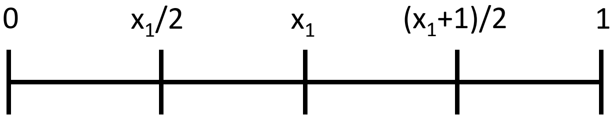
- All perfect Bayesian equilibria are equivalent to partially pooling equilibria of the following form
- There are $n \geq 1$ intervals $[0, x_1), [x_1, x_2), \ldots, [x_{n-1}, 1]$ such that all types in the same interval *convey* the same message, but types in different intervals *convey* different messages
- The pooling/babbling equilibrium, with just one interval, is the case with $n = 1$
- We might assume that the message sent by the types in the interval $[x_k, x_{k+1})$ is simply "t is in $[x_k, x_{k+1})$"
- There is a maximum number of intervals, which depends on b
- Crawford and Sobel (1982) show that when $b \to 0$, $n \to \infty$, and thus, there is perfect separation

Politicians and policy advisers (contd.)

- To see how this works, consider the PBE with a 2-interval equilibrium, i.e., $n = 2$
- We must find a point x_1 such that:
  - All types with $t \in [0, x_1)$ prefer sending the message "t is in $[0, x_1)$" to the message "t is in $[x_1, 1]$"
  - All types with $t \in (x_1, 1]$ prefer sending the message "t is in $[x_1, 1]$" to the message "t is in $[0, x_1)$"
  - The receiver updates his belief about the sender's type using Bayes' rule
  - And chooses policy to maximize his expected payoff, given his updated belief

Politicians and policy advisers (contd.)

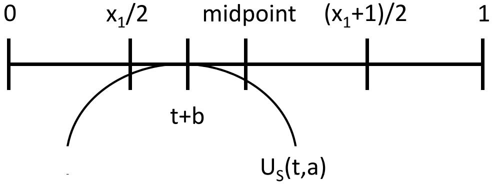
- Given the message "t is in $[0, x_1)$" Bayes' rule implies that the receiver's posterior belief is that $t \sim U[0, x_1)$
  - That is, $f(t) = 1/x_1$ for $t < x_1$, and $f(t) = 0$ for $t \geq x_1$. The receiver's optimal action is then $a = x_1/2$



- Similarly, given the message "t is in $[x_1, 1]$" the receiver's posterior belief is that $t \sim U[x_1, 1]$, and his optimal action is then $a = (x_1 + 1)/2$

Politicians and policy advisers (contd.)

- If we are looking at an equilibrium, then all senders with $t \in [0, x_1)$ must prefer the policy $x_1/2$ to the policy $(x_1 + 1)/2$
- Also, all senders with $t \in [x_1, 1]$ must prefer the policy $(x_1 + 1)/2$ to the policy $x_1/2$
- Since the sender's preferences are symmetric about his ideal point, he prefers $x_1/2$ to $(x_1 + 1)/2$ iff $x_1/2$ is closer to his ideal point than $(x_1 + 1)/2$
- This is true iff $t + b$ is less than the midpoint between $x_1/2$ and $(x_1 + 1)/2$



Politicians and policy advisers (contd.)

- The sender's preferences are continuous in his type
- So, at an equilibrium, a sender with type $t = x_1$ must be *indifferent* between the policies $x_1/2$ and $(x_1+1)/2$
- That is,

$$\left(\frac{x_1}{2} - x_1 - b\right)^2 = \left(\frac{x_1+1}{2} - x_1 - b\right)^2$$

$$-\left(\frac{x_1}{2} - x_1 - b\right) = \frac{x_1+1}{2} - x_1 - b$$

$$2(x_1 + b) = \frac{x_1+1}{2} + \frac{x_1}{2}$$

$$x_1 = \frac{1}{2} - 2b$$

Politicians and policy advisers (contd.)

- First, note that x_1 is uniquely determined for a given bias b
- Second, note that $x_1 \geq 0$ iff $b \leq \frac{1}{4}$
- That is, if b is too large, then only babbling can occur in equilibrium
- Useful communication is only possible when b is small enough, that is, when the preferences of the politician and his advisor are not too dissimilar
- Third, $x_1 < \frac{1}{2}$, so the first interval is *shorter* than the second
- Thus, in a sense, and on average, advisers whose preferences are closer to those of the politician send "more informative" messages than advisers whose preferences are farther away

Politicians and policy advisers (contd.)

* Possible remedies:

- Extensive communication
- Delegation
  - If policy bias not too large, delegation is better than any cheap talk equilibrium
- Contracts
  - Contracts are very effective but costly for the politician (i.e., full revelation is always feasible but never optimal)
- Multiple senders
  - How should the politician extract information, with simultaneous or sequential talks? Divide and rule?