Political Economy
Theory and Experiments

Lecture 3

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Agency models of re-election

. Downsian, citizen-candidate and probabilistic voting models are "prospective" theories.

. People vote only on the basis of credible electoral promises or candidate's ideologies.

. "Retrospective" models account for voters dismissing incumbents with poor performance, and retaining effective incumbents.

. Retrospective voting is modelled with repeated games and "simplified contracts."

. The principal (median voter) may only dismiss or retain an agent (politician), performance-based transfers are not allowed.

Moral hazard and adverse selection (Banks and Sundaram 1998)

. In each period $t = 0, 1, ...$, an infinitely-lived principal chooses whether to retain her agent, or hire a new one.

. Each agent is t employed at most 2 periods: t and $t + 1$.

. Each agent's ability $a \in \{a_1, ..., a_K\}$, is private information, and drawn from distribution p. Assume $a_1 < ... < a_K$.

. Each period, employed agent generates a random reward $r \in \mathbb{R}$.

. Reward distribution $F(r|e)$ depends on agent's effort $e \in [\underline{e}, \overline{e}]$.

. $F(r|e)$ has continuous density $f(r|e)$ of compact support R.

. $F(\cdot|e)$ is ranked in first-order stochastic dominance:
for any r, if $e > e'$, then $F(r|e) < F(r|e')$.

- Agent per-period payoff is $u(e, a)$ if employed, and 0 otherwise.
- u is continuous, strictly quasi-concave in e, and increasing in a:
  - opportunity cost of taking higher actions lower for better types;
  - for every $k = 1, ..., K$, there is a unique best effort e_k^* at the second period of employment.
- For each ability type a, there is an effort $e(a)$ with $u(e, a) > 0$.
- The payoff function u is supermodular in (e, a):

  If $(e, a) > (e', a')$, then $u(e, a) + u(e', a') > u(e', a) + u(e, a')$.

  (I.e. $u_{12} > 0$, if u is twice continuously differentiable.)
- The per-period principal's utility for reward r is $v(r)$, strictly increasing in r.
- The players' discount factors are $\delta_A \in [0, 1]$ and $\delta_P \in [0, 1)$.

- A strategy s^P for the principal specifies to dismiss (D) time-t agent or not (N), as a function of time-t history, for every time t.
- A strategy $s^{At} = (s^{At}_{k,\tau})_{\tau=0,1}$ for agent t specifies an effort e for both periods $\tau = 0, 1$ as a function of the time-$(t+\tau)$ history.
- Stationary anonymous strategies (s^P, σ^A) are such that
  - time-t retention rule depends only on effort of time-t agent,
  - each agent's effort at $\tau = 0$ depends only on her type a,
  - effort at $\tau = 1$ depends only on a and on reward r at $\tau = 0$.
- s^P is a cut-off strategy if there exists an $\bar{r}$ such that
  $s^P(r) = D$ if and only if $r < \bar{r}$.
- A mixed strategy σ_A is type-monotonic if
  - there exist $[\underline{e}_k, \overline{e}_k]$ s.t. $\overline{e}_k \leq \underline{e}_{k+1}$ for $k = 1, ..., K-1$, and $\sigma^A_{0k}([\underline{e}_k, \overline{e}_k]) = 1$ for all k;
  - for all $r \in \mathbb{R}$, $s^A_{1k}(r) \leq s^A_{1,k+1}(r)$ for $k = 1, ..., K-1$.

- The utility specification covers canonical cases.
- Agent is office motivated politician with two-term limit:
  - $u(e, a) = z - c(e, a)$, z is the office benefit,
  - $c(e, a)$ is opportunity cost of effort e by politician of type a, it is continuous in e, decreasing in a, and submodular in (e, a).
- The agent is an benevolent politician:
  - $u(e, a) = \int v(r) dF(r|e) - c(e, a)$.
- The agent's remuneration is a fixed share of profits $s(r)$:
  - the principal's share is $v(r) = r - s(r)$,
  - the agent's utility is: $u(e, a) = \int s(r) dF(r|e) - c(e, a)$.

Analysis

Proposition There exists an anonymous strategy equilibrium (s^P, σ^A) s.t. s^P is a cut-off strategy and σ^A is type-monotonic.

Sketch of Proof. Second-period effort of better agents is higher.

. Supermodularity of u implies also second-period payoff is higher.

. Now, suppose the principal employs a cut-off strategy.

. By FSD, higher effort yields higher expected principal reward.

. Then, better agents' incentive to exert first period effort is higher.

. A cut-off strategy is then a best response:

  . it screens better agents in the first period,

  . these better agents yield better rewards in the second period.

. Environment is "nice," if u and F are continuously differentiable, e_k^* is in the interior of $[\underline{e}, \overline{e}]$ and $u(\overline{e}, a_k) < 0$ for all k, and $\delta_A > 0$. for each a_k, $k = 1, ..., K$.

. Let r^* be the cut-off associated with the strategy s^P.

. Let $v_0(\sigma_0^A)$ be the expected principal reward in period 0, and $v_1(r, s_1^A)$ the reward in period 1.

Proposition When the environment is nice, in any anonimous equilibrium (s^P, σ^A), r^* is interior, $s_{1k}^A(r) < s_{1,k+1}^A(r)$, $\underline{e}_{k+1} > \overline{e}_k$, $\underline{e}_k > s_{1k}^A(r)$ for $k = 1, ..., K-1$, and $v_1(r^*, s_1^A) \geq v_0(\sigma_0^A)$.

. Screening makes each agent type exert more effort in first period.

. Screening leads to higher expected reward in second period.

. Without adverse selection, the equilibrium unravels.

Proposition If all agents have the same type, in equilibrium:

. the agent's effort is e^* in both periods;

. in a nice environment, the cutoff is $r^* \in \{\min R, \max R\}$.

Sketch of Proof. Effort must be weakly larger at $\tau = 0$ than $\tau = 1$.

. I prove it cannot be strictly larger with positive probability.

. If σ^P_{k0} placed positive probability on any effort $e > e^*$, then the principal's unique best response would be $r^* = \max R$.

. But then agent's unique optimal effort would be e^* at $\tau = 0$.

. Again by contradiction, if $\min R < r^* < \max R$, then the agent's optimal first period effort would be weakly larger than e^*.

. But then principal's unique best response would be $r^* = \max R$.

. Without adverse selection, there is no possibility of selection.

. But then, there are no incentives for high performance either, because the only principal's instrument is retention choice.

. Nevertheless, the principal cannot be better off if "worse" types are added, and cannot be worse off if "better" types are added.

. Instead, the principal can improve with adverse selection, if we "average out" types as follows: $\sum_{k=1}^{K} p_k E(e_k^*) = E(e^*)$.

. Take any equilibrium of the model with adverse selection.

. As all types of agents choose (weakly) higher effort in first period, the first-period principal payoff is $v_0 \geq \sum_{k=1}^{K} p_k E(e_k^*) = E(e^*)$.

. Because $v_1(r^*) \geq v_0$ in equilibrium, also $v_1(r^*) \geq E(e^*)$.

. As v_1 increases in r, the payoff of the principal is strictly higher than without adverse selection.

Candidate preference uncertainty (Duggan 2000)

. There is a continuum of citizen candidates, indexed by ideology b.

. Ideologies are private information and distributed according to the single peaked and symmetric density f on $[-a, +a]$.

. At any time t, the office holder selects a policy $x_t \in [-a, +a]$.

. Candidates for office cannot make credible promises.

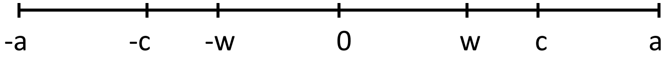
. At any time $t \geq 1$, the incumbent runs against challenger randomly drawn from f.

. The time-1 incumbent is randomly selected.

. The time-t utility of a citizen b depends on policy x_t, according to symmetric loss function $L(|b - x_t|)$, where $L' < 0$ and $L'' \leq 0$.

. Utilities are discounted with factor δ.

Theorem As long as voters are not too risk averse (i.e., if $|L''|$ is uniformly not too large), there is essentially a unique symmetric stationary PBE. The median voter is decisive.



. Incumbents with centrist *b* in *[0, w]* and extremists with *b* in *[c, a]* adopt their preferred policy *x = b* when in office.

. Centrist are reelected and extremists are voted out.

. Moderates with *b* in *[w, c]* compromise when in power. They adopt policy w and are reelected.

. Symmetrically for *b < 0.*

. Let U_b be the (normalized) equilibrium value for citizen b.

. The equilibrium obeys the following indifference equations:

$$L(w) = U_0, \quad L(c - w) = \delta U_c.$$

. The continuation utility of a voter b for electing challenger is:

$$U_b = \int_{-a}^{-c} [L(x\text{-}b)(1\text{-}\delta) + \delta U_b] dF(x) + \int_{-c}^{-w} L(c+b) dF(x)$$
$$+ \int_{-w}^{w} L(x\text{-}b) dF(x) + \int_{w}^{c} L(c\text{-}b) dF(x) + \int_{c}^{a} [L(x\text{-}b)(1\text{-}\delta) + \delta U_b] dF(x).$$

. Thresholds w and c are determined by 2 conditions:

$$L(w) = 2 \int_{c}^{a} [L(x)(1 - \delta) + \delta L(w)] dF(x)$$
$$+ 2 \int_{w}^{c} L(w) dF(x) + 2 \int_{0}^{w} L(x) dF(x). \quad (1)$$

. Median voter is decisive and indifferent between a random challenger and reelecting incumbent who implements policy w.

$$L(c-w) = \delta\{\int_{-a}^{-c}[L(c-x)(1-\delta)+\delta L(c+w)]dF(x) + \int_{-c}^{-w} L(c+w)dF(x) + \int_{-w}^{w} L(c-x)dF(x) + \int_{w}^{c} L(c-w)dF(x) + \int_{c}^{a}[L(c-x)(1-\delta)+\delta L(c-w)]dF(x)\}.$$

. Candidate c is indifferent between implementing policy w forever, or policy c once and then be replaced by random challenger.

. It cannot be that $w = 0$ and $c = a$, or else any incumbent with $b > 0$ would deviate from equilibrium and pick policy $x = b$.

. Further, if $c = a$, then it would need to be that $w = 0$. Else the median voter would not retain an incumbent with policy w, as this would be her worst possible equilibrium policy.

. Conversely, if $w = 0$, then it would need to be that $c = a$.

. Hence, it must be that $c < a$ and $w > 0$.

. The proof that $c > w$ is also by contradiction.

The judge and the politician (Maskin and Tirole 2004)

. Politicians have an incentive to align with the majority's will.

. This ensures representation, but may lead to pandering.

. Independent bureaucrats need not worry about re-election.

. Elected officers turn out to yield higher welfare if and only if their re-election concerns are not too strong.

. This condition is tighter the costlier information acquisition is.

. When considering minority rights, independent bureaucracy may become more effective even if politicians do not pander.

The basic case

. There are two periods $t = 1, 2$.

. At each time t, there is a state $x_t \in \{0, 1\}$,
and the policy maker chooses $y_t \in \{0, 1\}$.

. Median voter's payoff is $u_V(y_1, y_2) = \sum_{t=1,2} \beta^{t-1}(1 - |y_t - x_t|)$.

. Voter believes that $x_t = 1$ with prob. $p > 1/2$ for both $t = 1, 2$.

. The policy maker knows x_t for both $t = 1, 2$.

. With probability r, policy maker is congruent
and his policy payoff is $u_C(y_1, y_2) = g u_V(y_1, y_2)$.

. With probability $1 - r$, he is not congruent, his policy payoff
is $u_N(y_1, y_2) = -g u_V(y_1, y_2)$.

. The policy maker enjoys benefit w for being in office.

. Under direct democracy (DD), the decision is $y_t = 1$ for both $t = 1, 2$, because $p > 1/2$. Voter's welfare is $W^{DD} = (1 + \beta)p$.

. The independent bureaucrat need not worry about reelection. The voter's welfare is $W^{IB} = (1 + \beta)r$.

. Elected politicians stand for re-election between periods $t = 1, 2$.

. At time $t = 2$, he chooses his preferred action.
Hence, office motivation is determined by $\delta \equiv \beta \frac{g+w}{g}$.

. If $\delta > 1$, policy maker panders, he picks $y_1 = 1$ for re-election.

. Welfare of representative democracy (RD) is $W^{RD} = p + \beta r$.

. Representative democracy is dominated by either independent bureaucracy or direct democracy.

. When $\delta < 1$, politician picks his preferred y_1.

. Voter beliefs: $r|1 = \frac{pr}{pr+(1-p)(1-r)}$, $r|0 = \frac{(1-p)r}{(1-p)r+p(1-r)}$.

. Because $r|0 < r < r|1$, politician is re-elected iff $y_1 = 1$.

. Welfare is $W^{RD} = r(1 + p\beta + (1-p)\beta r) + (1-r)p\beta r$.

. Representative democracy dominates independent bureaucracy, and it dominates direct democracy if $p < \frac{r+r^2\beta}{\beta - 2r\beta + 2r^2\beta + 1}$

. Say now that acquiring information costs c.

. The independent bureaucrat investigates if $c < (1-p)g \quad (1)$.

. A congruent politician investigates if (1) and:
$p(g + \beta(g + w - c)) + (1-p)g - c \geq pg + \beta(g + w - c)$.

. Representative democracy is penalized by costly information, because pandering does not require costly information.

The feedback case

- With prob. q, voter learns x_1 between $t = 1$ and $t = 2$.
- The equilibrium with no feedback holds if $\delta(1 - 2q) \geq 1$.
- If $\delta q > 1$, then there is an equilibrium in which:
  - the politician chooses $y_1 = x_1$ regardless of his type,
  - if the electorate does not learn x_1, incumbent is re-elected.
- The voter welfare is $W^{RD} = 1 + \beta r$.
- If $\delta q < 1$, then there is a mixed strategy equilibrium:
  - congruent politicians choose $y_1 = x_1$,
  - non-congruent politicians play $y_1 = 1$ if $x_1 = 0$, and play $y_1 = 0$ with prob. $\sigma = \frac{1}{p} - 1$ if $x_1 = 1$.
- The voter welfare is $W^{RD} = r + (1 - r)(2p - 1) + \beta r > W^{IB}$.

Divided electorate

- Suppose $p \in [0,1]$, and aggregate voter welfare is

$$W(y_t, x_t) = \begin{cases} 0 & \text{if } y_t = 0 \\ B > 0 & \text{if } \ y_t = x_t = 1 \\ L < 0 & \text{if } \ y_t = 1 - x_t = 1. \end{cases}$$

- The majority prefers $y_t = 1$, and minority prefers $y_t = 0$.
- Direct democracy welfare is $W^{DD} = (1+\beta)[pB + (1-p)L]$.
- Office holder type $b \in \{M, m, W\}$, with prob. r^M, r^m, r^W.
- M sides with majority, m with the minority, W picks $y_t = x_t$.
- Independent bureaucracy welfare is

$$W^{IB} = (1+\beta)[r_M(pB + (1-p)L) + r_W pB].$$

- Representative democracy is analogous to previous case.

. If $\delta > 1$, then politician panders and chooses $y_1 = 1$.

. Representative democracy welfare is:

$$W^{RD} = pB + (1-p)L + \beta[r_M(pB + (1-p)L) + r_W pB].$$

. Representative democracy is either dominated by direct democracy or by independent bureaucracy.

. If $\delta < 1$, then the politician does not pander.

. She is reelected if of type $b = m$ or if $b = W$ and $x_t = 0$.

. Representative democracy welfare is:

$$W^{RD} = [r_M(pB + (1-p)L) + r_W pB] + r_M\beta(pB + (1-p)L) \\ + r_W p\beta pB + (r_W(1-p) + r_m)\beta[r_M(pB + (1-p)L) + r_W pB].$$

. Independent bureaucracy dominates if p is small, direct democracy if p large, representative democracy if p intermediate.

Summary

. I have presented agency models of election.

. Voters do not care about electoral promises.

. They retain effective incumbents, and dismiss incumbents with poor performance to elect the challenger.

. If candidates' valence and ideologies are known, retention rules are ineffective.

. If candidates' valence or ideologies are uncertain, such retention rules encourage high effort/platform moderation.

. Independent bureaucracy is immune to pandering.

. Representative democracy dominates bureaucracy when it does not lead to pandering (Maskin and Tirole 2004).

Next Lecture

. I will consider how well elections aggregate information.

. If voters vote truthfully, then they select the "best" alternative by the law of large numbers.

. The fraction of voters who vote informatively in equilibrium converges to zero in large elections, and the election must be close.

. Nevertheless the chosen alternative is the same that would be chosen if all information became common knowledge.

. I will present a model in which voters have different information about candidates' valence.

. There exists an equilibrium in which informed non-partisan voters are pivotal, and the "best" candidate is elected.