Gov 2006: Formal Political Theory II
Section 8

Sophie Hill

April 2, 2019

Today: consequences of political institutions

Two papers that take political institutions as exogenous and focus on incentives they give to politicians

- Lizzeri & Persico (2001)
    - PR/FPTP $\rightarrow$ public goods
- Persson, Roland & Tabellini (2000)
    - presidential/parliamentary $\rightarrow$ size of government, rents, composition of spending

Lizzeri & Persico (2001)

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This paper:

- Simple model to focus on when politicians 'play' G (public goods).
- Providing G is the efficient choice – but politicians care about winning and can target spending to specific voters instead.
  - "trade-off between efficiency and targetability"
- Aim: how does proportional representation/majoritarian systems affect G versus targeted transfers.
- Idea: in PR, redistribution becomes less attractive as G becomes more valuable, but invariant under FPTP.

Setup

- Candidates $i = \{1, 2\}$. Continuum of voters $v \in V = [0, 1]$.
- Two goods: G and money, x.
    - G can only be produced using all the money in the economy – maximum taxation, no transfers.
    - Each v endowed with 1 unit of x.
- v are homogeneous in preferences, and have linear utility over two goods.
- i are homogeneous, maximise rents, and make binding promises to each voter.

Strategies

Candidate i can either provide G to all, of can offer taxes/transfers to different voters:

Pure strategy: $\Phi_i : V \mapsto [-1, \infty)$

1. Either **public good**: $\Phi_i(v) = G - 1$.
   - So utility is $\Phi_i(v) + 1 = G \;\; \forall v \in V$
2. Or **redistribute**: voter v gets transfer $\Phi_i(v)$ and $\int_V \Phi_i(v) dv = 0$.

Voter v votes for candidate i iff $\Phi_i(v) > \Phi_h(v)$. If equal, randomises.

Order of play

1. Candidates simultaneously choose $\Phi_i(v)$ (platforms are binding).
2. All voters vote simultaneously and sincerely, and randomise if offered the same expected utility.

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How are institutions different?

- In proportional systems, rents increase with vote share $\rightarrow$ **maximise vote share**.
- In majoritarian systems, all rents go to the winner $\rightarrow$ **maximise probability of winning**.

Easy cases

Search for a simple Nash equilibrium – value of G is the critical parameter.

If $\mathbf{G > 2}$ then, both parties provide G in equilibrium. Why?

- If i provides G then voters receive utility $\Phi_i(v) = G - 1 > 1 \;\; \forall v$.
- Candidate h cannot devise a transfer schedule that gives > 1 to 50% of voters due to the budget constraint. Thus, the best response is to also offer G for a tie.

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This is invariant to political institutions: candidates provide G in equilibrium when the public good is really good, and transfer when really bad.

Interesting case: $1 < G < 2$

For $1 < G < 2$, there is no equilibrium in pure strategies. Why?
Suppose $\mathbf{G} = \mathbf{\frac{3}{2}}$ to illustrate the logic.

- If my opponent provides G, then all voters would get $\frac{3}{2}$ utility.
    - But I can fully tax $\frac{1}{3}$ of voters, then redistribute to the rest and get $\frac{2}{3}$ of votes. Cannot be an equilibrium!
- What if opponent provides transfer schedule $\Phi(v)$?
    - I can take all endowment from a set V_1 of voters and give $\Phi(v) + \epsilon$ to all other voters, winning close to 100% of votes.

$\Rightarrow$ So we have to look for a mixed strategy Nash equilibrium.

Mixed strategies buy us 'smoothness' in candidate payoffs to get an equilibrium – compare to probabilistic voting models.

Key results

1. FPTP: unique equilibrium both candidates offer the public good with probability $\alpha_i^* = \frac{1}{2}$.
2. PR: unique equilibrium both candidates offer the public good with probability $\alpha_i^* = G - 1$
3. When candidates $i = 1, 2$ offer transfers instead, then the optimal transfer schedule is the same under FPTP and PR. The greater is G, the lower the share of voters receiving positive transfers.

Intuition for equilibrium transfer schedule

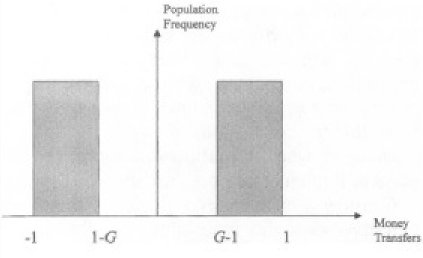

FIGURE 1. REDISTRIBUTION OF RESOURCES AT EQUILIBRIUM

Intuitively: to beat the utility that each voter would have with G, an optimal schedule transfer entails giving more than $G - 1$ to some voters and "taxing" the others.

We have a more unequal distribution the higher is G: need to take a lot from the "unlucky" voters to buy the "lucky" ones.

Intuition for probability of providing G

In equilibrium we have:

- FPTP: probability of providing G is $\frac{1}{2}$, independent of the value of G.
- FPTP: probability of providing G is $G - 1$, increasing in value of G.

Why? Need to think about best possible deviations.

Intuition for probability of providing G

Deviation from the mixing equilibrium can be done in two ways:

- If the opponent ends up providing the public good, *ex ante*, in the best deviation, I need to offer a little more than $G-1$ to win voters:
  - PR: I will offer a little more than $G-1$ to a little less than $\frac{1}{G}$.
  - FPTP: always possible to win a majority of voters, I don't care about size of majority.
- If the opponent ends up providing transfers, *ex ante*, in the best deviation, I want to take from voters getting positive transfers and buy as many "cheap" voters as possible.
  - PR: I can buy more "unlucky" voters the higher G, since the "lucky" voters that I am taxing were getting a higher transfer by the other candidate.
  - FPTP: again, I don't care about size of majority: always possible to win a majority.

Intuition for probability of providing G

Therefore:

- FPTP: I am ex ante indifferent between the two types of deviations: I just need 50 percent of the votes, and that is always possible. Therefore to discourage both kind of deviations we need an equal likelihood that the opponent offers public good or transfers, independently of G.
- PR: the higher G, the less votes I can get if I choose the best deviation if the opponent ends up providing G, and the more those that I can get if I choose the best deviation if the opponent ends up providing transfers: to avoid both deviations simultaneously, the probability that the opponent provides G must increase with the size of G

Implications?

What are the testable implications of these results?

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What's missing from the model?

What's missing: political coalitions?

TABLE 1. Electoral System and the Number of Years With Left and Right Governments (1945–98)

		Government Partisanship		
		Left	Right	Proportion of Right Governments
Electoral system	Proportional	342 (8)	120 (1)	0.26
	Majoritarian	86 (0)	256 (8)	0.75

Note: Excludes centrist governments (see text below for details).

Iversen, Torben, and David Soskice. "Electoral institutions and the politics of coalitions: Why some democracies redistribute more than others." *American Political Science Review* 100.2 (2006): 165-181.

Persson, Roland & Tabellini (2000)

Huge variation in size and composition of government spending over time and across countries.

- PRT: aim to provide a micro-founded public finance model of government outputs in different political systems.
- Parliamentary vs presidential $\rightarrow$ differences in collective decisions on taxation, redistribution, public goods, rents.

Foundational principles:

- People are selfish.
- Policy delegation by electors (principals) to representatives (agents): no direct democracy.
- No outside enforcement $\rightarrow$ no commitment.

Persson, Roland & Tabellini (2000)

PRT focus on the implications of these three assumptions under different political systems. Useful to contrast to models we've looked at in this class:

- Downs (1957), Lindbeck & Weibull (1987): Ignores commitment.
- Besley & Coate (1997): Rules out the agency problem.
- Barro (1973), Ferejohn (1986): Ignores institutions.
- Meltzer & Richard (1987): Ignores delegation.

Political process $\rightarrow$ taxes, public goods, rents. Three conflicts:

- Politicians taking rents from voters.
- Voters disagreeing over allocation of tax revenues.
- Politicians disagreeing over distribution of current/future rents.

Persson, Roland & Tabellini (2000)

Political constitutions like an incomplete contract: specifies decision-making process. Key variation in *separation of powers* and *legislative cohesion*.

- Presidential: separation of powers $\rightarrow$ less scope for collusion between politicians (so less agency problem). Smaller government, inefficiently small spending on public goods.
- Parliamentary: larger government, more redistribution which benefits a broader set of voters due to more legislative cohesion (solves conflict between voters).

Setup

Infinite number of periods t. Policy vector $\mathbf{q}_t = (\tau_t, g_t, \mathbf{r}_t^i, \mathbf{s}_t^I)$ chosen every period.

- τ common lump sum tax, r_t^i transfers to group i, g_t public good, $\mathbf{s}_t$ rents to incumbent I.

Voters: three internally homogeneous geographic groups $i = \{1, 2, 3\}$ each with population mass 1 (indirect) utility/preferences in period j:

$$u_j^i = \sum_{t=j}^{\infty} \delta^{t-j} U^i(\mathbf{q}_t)$$

where $\delta < 1$ is a discount factor common to all actors and

$$U^i(\mathbf{q}_t) = c_t^i + H(g_t) = 1 - \tau_t + r_t^i + H(g_t)$$

with $H' > 0$, $H'' < 0$ and $H'(0) > 1$.

Setup

Politicians: infinite potential politicians, always three incumbents I who maximize the discounted present value of their rents:

$$v_t^I = \sum_{t=j}^{\infty} \delta^{t-j} s_t^I D_t^I$$

$D_t^I = \{0, 1\}$ is an indicator for whether I holds office in period t. A politician can never return to office. Note that rents have different values for different politicians (but we abstract from that).

Setup

Government budget constraint is:

$$3\tau_t = \sum_i r_t^i + \sum_l s_t^l + g_t$$

so there are no waste or work disincentives.

Constitution will affect the balance between:

- Activities benefitting all i: g_t, $-\tau_t$.
- Activities benefitting some i: $\mathbf{r}_t^i$.
- Activities benefitting some l: $\mathbf{s}_t^l$.

Initial benchmarks

Social Planner: sets

$$\mathbf{q}_t = \arg\max_{\mathbf{q}_t} \sum_i U^i(\mathbf{q}_t)$$

which yields $s_t^l = 0, \forall l$ and $r_t^i = 0, \forall i$.

Set g_t to maximise $3[1 - \tau_t + H(g_t)] \Rightarrow g_t = H'^{-1}(\frac{1}{3})$ and $\tau_t = \frac{H'^{-1}(\frac{1}{3})}{3}$.

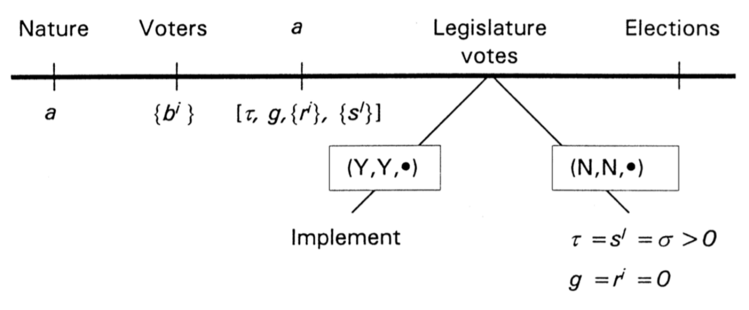
Leviathan: sets $s_t^{Lev} = 3$ and $\tau_t = 1$ in any given period.

A simple legislature

Sequence of play for any period t:

1. Nature selects agenda-setter a from $l = 1, 2, 3$ w.p. $p_l = \frac{1}{3}$.
2. All voter groups i choose and reveal optimal re-election rules $b_t^i | a$.
3. a proposes $\mathbf{q}_t$
4. All l vote under majority rule – if 2 are in support it passes, otherwise bargaining ends with status quo policy $\tau_t = s_t^l = \sigma > 0, \forall l$ and $g_t = r_t^i = 0, \forall i$. (A sad status quo)
5. All i vote on whether to keep their corresponding l in office according to re-election rule.

A simple legislature



Voting rule

Voters in each district choose the following rule, conditional on whether $i = a$ (which they observe):

$$D^l_{t+1} = 1 \text{ if } U^i(\mathbf{q}_t) \geq b^i_t$$

which yields a vector of each i's reservation values $\mathbf{b}_t$ (known to politicians) for $i = a$ and $i \neq a$.

Equilibrium concept

There are many equilibria – so let's keep things simple-ish.

- Voters *across* constituencies do not coordinate.
- Stationary strategies.

So voters cooperate within districts but play Nash against others.

Three criteria define a unique stationary equilibrium $\mathbf{q}_t^L(\mathbf{b}_t^L)$ and reservation utilities $\mathbf{b}_t^L$:

1. $\forall \mathbf{b}_t, \exists i \neq a$ such that i prefers $\mathbf{q}_t^L(\mathbf{b}_t^L)$ to the reversion outcome.
2. a prefers $\mathbf{q}_t^L(\mathbf{b}_t^L)$ to any other outcome satisfying point 1.
3. $\forall i, b_t^{iL}$ is optimal given $\mathbf{q}_t^L(\mathbf{b}_t^L)$ and b_t^{-iL}.

Results in simple legislative game

Proposition 1

In equilibrium in the simple L game we have

$$\tau^L = 1$$
$$s^L = 3\frac{1-\delta}{1-(\delta/3)}$$
$$g^L = \min\left[\hat{g}, \frac{2\delta}{1-(\delta/3)}\right]$$

where $\hat{g}$ is implicitly defined by $H'(\hat{g}) = 1$.

$$r^{aL} = \frac{2\delta}{1-(\delta/3)} - g^L \geq 0$$
$$r^{iL} = 0, \forall i \neq a$$

Results in simple legislative game

...and all politicians get reelected. So taxes are maximal, g underprovided, some redistribution goes to a minority, and legislators get rents.

A. Bertrand competition between districts.

1. Consider $m, n \neq a$.
2. a only needs support of one other legislator.
3. If n is excluded, then $s^n = r^n = 0$.
4. So district included will be the cheapest one – depends only on b^n and b^m.
5. Implies Bertrand competition for transfers between voters of different districts – so $r^m = r^n = 0$, and $b^m = b^n = 1 - \tau + H(g)$.

Results in simple legislative game

B. Legislators get re-elected.

1. W expected equilibrium continuation value before Nature.
2. Consider legislator m: if a wants re-election, will never offer more than:

$$s^m = \sigma - \delta W$$

3. This leaves m indifferent between voting yes and getting reappointed, and voting no, getting σ, then losing office.
4. If a does not want re-election, will just offer σ to m to win support, then $g = r = 0$ and $\tau = 1$.
5. So a seeks re-election $\Leftrightarrow s^a + \delta W \geq 3 - \sigma$.
6. So a and m implement policies leading to re-election $\Leftrightarrow s = s^m + s^a \geq 3 - 2\delta W$.
7. Since $r = 0$ in m, n, reservation utility of voters the same $\rightarrow$ both get re-elected.

Results in simple legislative game

B. Legislators get re-elected. (cont'd)

a wants to minimise payment to *m* and satisfy re-election constraints in *a* and *m* with equality – and take the rest for themselves. So wants to set $\tau = 1$ if they can.

Proving Proposition 1

1. Consider voters in a. We know $r^a = r$.
2. Policy maximising their utility is argmax $(r + 1 - \tau + H(g))$ subject to government budget constraint and politician IC constraint.
3. Combining constraints: $3(\tau - 1) + 2\delta W \geq r + g$.
4. Solution implies $\tau = 1$, $g = \min(\hat{g}, 2\delta W)$, $r = 2\delta W - g$, $s = 3 - 2\delta W$.
5. All legislators are reappointed, which implies $W = \frac{s}{3} + \delta W$.

This gets us to the equilibrium (Proposition 1) by substituting in.

Intuition for results:

Voters in m, n compete a la Bertrand for transfers: so they get 0 transfer.

Voters in a discipline agenda setter: minimum rent to have incentive to be re-elected. Also other legislators get re-elected, given that their voters, being rational, lower the standards to re-elect them.

Voters in a's district are the only to get transfers, so they prefer maximum taxation.

Agenda-setter is basically just setting policy to maximise the utility of voters in a. In conclusion: wasteful rents, under-provision of public good, and politically powerful minority receive all redistribution.

Characterizing presidential systems

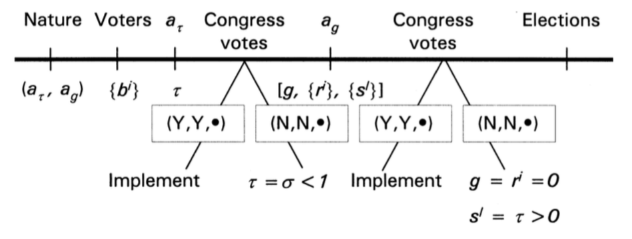
Defining feature for PRT is separation of powers: capture this with distinct agenda-setters on the budget and spending.

Key idea: separation of powers exploits conflict between politicians to reduce the agency problem.

Presidential (C) system

1. Nature randomly selects a_τ and a_g (where no l can be both). (So $l \in \{a_\tau, a_g, n\}$.)
2. All voter groups i choose and reveal optimal re-election rules $b^i | a_\tau, a_g, n$.
3. a_τ proposes budget τ.
4. All l vote on τ under majority rule – if 2 are in support it passes, otherwise bargaining ends with status quo policy $\tau = \sigma < 1$.
5. a_g proposes spending $\{g, \mathbf{s}, \mathbf{r}\}$ subject to budget constraint $\sum_i r^i + \sum_l s^l + g \leq 3\tau$
6. All l vote on $\{g, \mathbf{s}, \mathbf{r}\}$ under majority rule – if 2 are in support it passes, otherwise bargaining ends with status quo policy $s^l = \tau, \forall l$ and $g = r^i = 0, \forall i$.
7. All i vote on whether to keep their corresponding l in office according to re-election rule $b^i | a_\tau, a_g, n$.

Presidential (C) system



Solution to the presidential game

Proposition 2

In equilibrium in the presidential game C we have

$$\tau^C = \frac{1-(\delta/3)}{1+(2\delta/3)} < \tau^L = 1$$

$$s^C = 3\frac{1-\delta}{1+(2\delta/3)} < s^L$$

$$g^C = \min\left[\hat{g}, \frac{2\delta}{1+(2\delta/3)}\right] \leq g^L$$

where $\hat{g}$ is implicitly defined by $H'(\hat{g}) = 1$

$$r^{a_g C} = \frac{2\delta}{1+(2\delta/3)} - g^C \leq r^{aL}$$

$$r^{iC} = 0, \forall i \neq a$$

$$b^{aC} = H(g^C) - g^C + \frac{2\delta}{1+(2\delta/3)}$$

$$b^{iC} = H(g^C), \forall i \neq a$$

Intuition for the result:

Solve the game through backward induction:

1. In last stages, voters of districts other than a_g again compete Bertrand-style and get no transfers.
2. Voters in a_t – seeing what will happen – set taxes to minimum such that their legislator behaves.
3. Public goods even lower – since W is lower – than in L.
4. Government waste is lower because a_g has access to less revenue, so IC constraint faced by voters is less severe.

Presidential regime: Observations

Separation of powers produces lower taxes, redistribution to powerful minority, and rents: smaller size of government.

But we need separation of powers over **size** and **division** of the pie to have check and balances.

Interpretation: Presidential-Congressional regime as in the US, with:

- Different committees with proposal power over different policy dimensions;
- No need of forming stable coalitions to support the executive (since directly elected): low legislative cohesion.

Parliamentary (P) systems

Parliamentary systems characterized by random members of a legislative coalition making up the "government". One member is senior and proposes a budget.

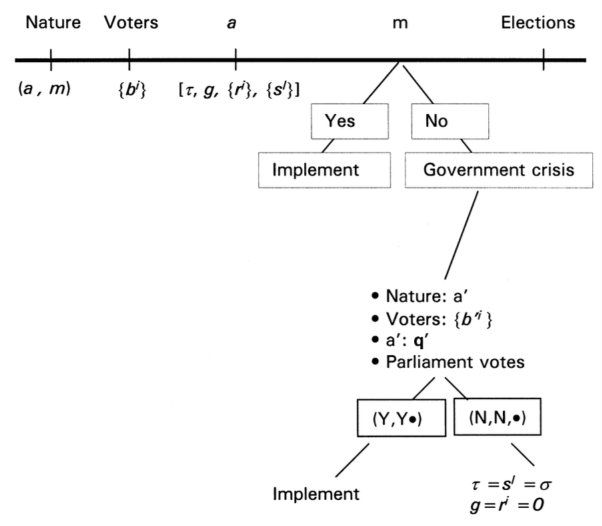
The intuition is that legislators are tied together by legislative power relative to being out of the governing coalition, but senior coalition partner has more power.

If junior coalition member opposes proposal, she causes a crisis: instead of leading to the status quo (as in presidential regime), this leads to a new agenda setter chosen.

Game play in parliamentary systems

1. Nature randomly selects a senior coalition partner a and a junior coalition partner m.
2. All voter group i choose and reveal optimal re-election rules $b^i | a, m$.
3. a proposes $\mathbf{q}_a$ subject to the budget constraint $\sum_i r_a^i + \sum_l s_a^l + g_a \leq 3\tau$.
4. m then gets to choose whether to veto $\mathbf{q}_a$: if not, it passes and we then proceed to elections; if vetoed, move to the next stage...
5. Play the simple legislative bargaining game with a' now randomly selected from $i = \{a, m, n\}$ (voters recalibrate to $b^l | a'$)
6. All i vote on whether to keep their corresponding l in office according to re-election rule $b^i | a_\tau, a_g$.

Parliamentary (P) system



Solution to the parliamentary game

Proposition 3

In equilibrium in the parliamentary game P we have a continuum of equilibria:

$$\tau^P = 1 = \tau^L > \tau^C$$

$$s^P = 3\frac{1-\delta}{1-(\delta/3)} = s^L > s^C \text{ with } s^{aP} = \frac{2}{3}s^P, s^{mP} = \frac{1}{3}s^P$$

$$\bar{g} \geq g^P > g^C \text{ where } H'(\bar{g}) = \frac{1}{2}$$

$$r^P = \frac{2\delta}{1-(\delta/3)} - g^P \geq 0, \forall i \neq n \text{ where } g^P = \bar{g} \text{ if } r^{iP} > 0 \text{ for } i = a, m$$

$$b^{iP} = H(g^P) + r^{iP} \text{ or } b^{a'P} = H(g') - g' + \frac{2\delta}{1-(\delta/3)}$$

$$b' = H(g') \text{ with } g' = \min\left[\hat{g}, \frac{2\delta}{1-(\delta/3)}\right]$$

Intuition for the result

a and m have veto rights: voters in their districts can demand higher transfers: bilateral monopoly replaces Bertrand competition for transfers.

Higher taxation than in Presidential regime, and redistribution from minority to majority.

Public good provision higher, since benefit of the public good now internalised by two districts instead of one – but given the desirability of transfers at the expense of the minority, still under provision relative to optimum.

Intuition for the result

The threat of going through a government crisis now enables legislators to appropriate as much rents as in the simple legislature game, but now rents are more equally distributed.

Why? Voters know that, if there is a government crisis, there is a new process of government formation (with rents given by L): this threat allows the government coalition to extract more rents.

Comparing utility: an inevitable trade-off?

The difference in expected utility between the systems is

$$E(u^{iP}) - E(u^{iC}) =$$

$$\frac{1}{1-\delta}\left(H(g^P) - \frac{1}{3}g^P - [H(g^C) - \frac{1}{3}g^C] - \frac{\delta(1-\delta)}{(1-(\delta/3))(1+(2\delta/3))}\right)$$

where the first two terms give the relative benefit from G closer to optimum in P, but the third term captures the deadweight loss associated with higher s in P.

Conclusions

- Parliamentary regimes $\rightarrow$ larger govt vs persidential regimes
- P better for voters when $g^P > g^C$ or if δ small.
- P also gives greater equality of transfers.
- PRT show some empirics on government size being larger in P. (One estimate: spending in presidential-congressional regimes lower by 10% of GDP versus parliamentary!)
- Endogenous institutional choice? s higher under P so constitution-writers should not have electoral incentives.

Trade-offs

“The parliamentary regime appears better for voters if the underprovision problem is great (because public goods are very valuable), whereas the presidential regime dominates if the political agency problem is highly relevant (because politicians face small transaction costs in rent extraction or the punishment from losing the next election is small - for instance, because of barriers to entry in the political arena).” (PT p.267)

Discussion q's

Does the model capture the key features of parliamentary vs presidential regimes?

How convincing are their empirics?