

# Elections and Governments

## Political Economy

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# Goals of the Lecture

Focus on Democracies:

- 1 The Data
- 2 Electoral Rules
- 3 Models of Electoral Accountability with Multiple Districts: Plurality vs. Proportional Representation.
- 4 Regime Type (Form of Government): Presidential vs. Parliamentary Regimes.
- 5 Comparative Politics and Models of Regime Types.

Source: Persson and Tabellini Ch. 8, 10

# Comparative Constitutional Analysis in Democracies

We zoom in on the **inner workings of democracies**.

We will start from an analysis of the main channel of political representation: Elections.

**The electoral rule** is crucial to the definition of electoral incentives of politicians.

We will then move to the analysis of the executive. In particular, we will focus on the constraints on the executive as determined by the **form of government** of the country.

## Definition

The procedure through which voters' preferences are translated into political representation.

In a representative democracy, elected politicians form the legislature and influence or determine policy.

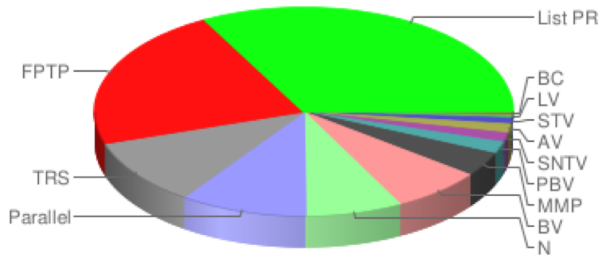
Political scientists tend to **focus on the effects of electoral rules on political outcomes**.

- Example: the party and coalition structures. Duverger's Law states that plurality electoral rules tend to induce a polarized party system (i.e. a two-party system, e.g. US). See Fujiwara (QJPS 2012) and, for an exception, India (plurality+multiparty cabinets).

**Political economists** tend to focus on the **effects of electoral rules on economic outcomes**.

- Example: Fiscal Policy. Persson & Tabellini (2003, 2004) show how PR systems have larger governments & more spending than plurality systems. Milesi-Ferretti, Perotti & Rostagno (QJE 2002) show that geographic transfers are higher in plurality systems. Persson, Tabellini & Trebbi (2003): PR systems tend to have higher political graft.

# World Distribution of Electoral Systems



Source: *The International Institute for Democracy and Electoral Assistance (International IDEA) 2005. Lower chamber or single chamber rule.*

# Classifications (source: IDEA)

## List Proportional Representation (List PR)

- Each party or grouping presents a list of candidates for a multi-member electoral district
- The voters vote for a party, and parties receive seats in proportion to their overall share of the vote.
- In some (closed list) systems, the winning candidates are taken from the lists in order of their position on the lists. If the lists are 'open' or 'free' the voters can influence the order of the candidates by marking individual preferences.
- **Examples:** Brazil, Finland, Italy, Netherlands, Israel.

## First Past The Post (FPTP)

- The simplest form of plurality/majority electoral system.
- The winning candidate is the one who gains more votes than any other candidate, even if this is not an absolute majority of valid votes.
- The system uses single-member districts and the voters vote for candidates rather than political parties.
- **Examples:** Canada, India, UK, USA.

# Classifications (source: IDEA) (cont.)

## Two-Round System (TRS)

- Plurality/majority system in which a second election is held if no candidate or party achieves a given level of votes, most commonly an absolute majority (50 per cent plus one), in the first election round.
- May take a majority-plurality form—more than two candidates contest the second round and the one wins the highest number of votes in the second round is elected, regardless of whether they have won an absolute majority—or a majority run-off form—**only the top two candidates in the first round contest the second round.**
- Examples: Egypt, France.

## Parallel Systems

- Mixed system in which the choices expressed by the voters are used to elect representatives through two different systems—one List PR system and (usually) one plurality/majority system.
- No account is taken of the seats allocated under the first system in calculating the results in the second system.
- Examples: Japan, South Korea, Pakistan.

# Classifications (source: IDEA) (cont.)

## No Direct Elections (N)

- Examples: China, Saudi Arabia

## Block Vote (BV)

- Plurality/majority system used in multi-member districts.
- Electors have as many votes as there are candidates to be elected. The candidates with the highest vote totals win the seats.
- Usually, voters vote for candidates rather than parties and in most systems may use as many, or as few, of their votes as they wish.
- Examples: Lebanon, Mauritius

## Mixed Member Proportional System (MMP)

- Mixed system in which the choices expressed by the voters are used to elect representatives through two different systems
  - One List PR system, and (usually) one plurality/majority system—where the List PR system compensates for the disproportionality in the results from the plurality/majority system.
- Examples: Mexico, New Zealand



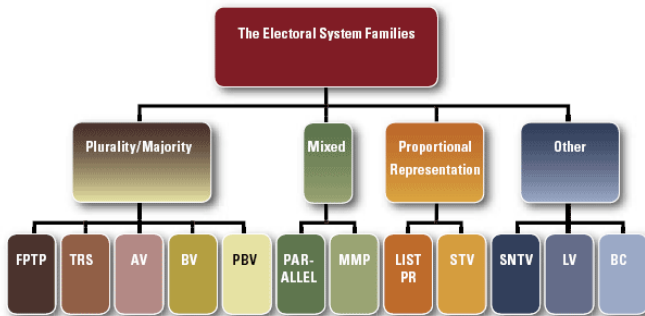
# More Subtle Rules: Single Transferable Vote

Akin in spirit to PR.

- 1 Multimember districts.
- 2 Voters face a list of candidates. They rank them based on preferences  $1^{st}, 2^{nd}, 3^{rd} \dots$
- 3 Minimum number of preferences (votes) to be elected: Threshold =  $1 + \text{Total Valid Ballots Cast} / (1 + \text{Seats})$
- 4 All candidates that reach that threshold with their first preferences are elected.
- 5 Their surplus votes (if any) are transferred to the other candidates (e.g. if I get too many  $1^{st}$  I will pass them to the  $2^{nd}$  on those ballots).
- 6 If no-one meets the quota the last candidate in number of preferences is dropped and his/her votes transferred up.
- 7 The algorithm continues until winner is found for every seat.

# Electoral System Families

Figure 1: The Electoral System Families



Source: *The International Institute for Democracy and Electoral Assistance (International IDEA)*

# Electoral rules are not constant over time

**Example 1:** New Zealand changed its electoral rule from First-Past-The-Post to a mixed system including proportional representation (PR) elements. Goal: strengthen minority.

**Example 2:** In 1994 Japan moved from a Single Non-Transferable Voting (SNTV) system to a Parallel system with both plurality and PR elements. It was first employed in the 1996 elections.

# Electoral rules are not constant over time (cont.)

**Example 3:** In 1993, Italy changed its electoral rule from pure list PR to a parallel system with 75% of the seats allocated by plurality rule and 25% by PR. In 2005 it reverted back to pure PR right before the elections (Incumbent government was fearing larger losses under the FPTP than under PR). See Persson and Tabellini (2004).

**Example 4:** Strategic Manipulation of electoral rules. Alesina and Glaeser (2004) discuss how PR was abandoned in the post-war US in order to exclude socialists and communists. Southern US Cities immediately after the 1965 Voting Rights Act moved from Single-District elections to At-Large electoral rules in order to disenfranchise the newly registered African-American voters (Trebbi, Aghion, and Alesina, QJE 2008).

# Systematic Features

The design of electoral rules involves some systematic features.

An important feature of an electoral rule is **representation**. An electoral rule has to translate voters' preferences into an elected body of representatives which mirrors them as closely as possible.

Second, **accountability** is key. An electoral rule has to make politicians accountable to voters.

Note: See *Handbook of Political Economy* chapter by Persson and Tabellini.

## Are representation & accountability in conflict?

- Think of a single district electing one politician by majority rule.
- Assume candidate 1 is voted by 51% of the population (constituency A).
- Who's going to represent the remaining 49% (constituency B)?  
**Nobody.**
- On the other hand, **an incumbent elected by such a narrow margin will be very responsive to voters.** If he or she disappoints 1% of constituency A (and at the next election they vote for the other candidate to punish you), candidate 1 is out.

# Systematic Features (cont.)

Now make it a multi-member district with PR. 100 members.

- Each constituency (A and B) is going to elect different politicians (51 and 49 respectively). So representation of B is higher than under plurality (before was 0).
- But who's going to discipline the politicians? *If you disappoint 1% of your group, you are just going to lose only 1 member, not the whole lot as under plurality rule.* [If you follow the parallelism you will notice that under majority rule it would be equivalent to losing all 100 members].

Note: If you are not convinced, here's *another way to look at the difference* in representation between a plurality system and proportional representation: Under plurality rule a party can control the legislature with *just 25% of the popular vote* (50% of votes in 50% of the districts). Under PR a party can control the legislature only with *50% of the popular vote*. *UK in '51 and '74 winner lost popular vote but won majority of seats.*

# Systematic Features (cont.)

Think harder. Is the trade off between representation and accountability always so obvious?

What happens to accountability in a plurality system when a politician knows that a majority of voters is going to be voting for her anyway?

See Myerson (1993). Bandwagon effect of plurality rule. Suppose a politician is a “**bundle of policies**”, some of them welfare-diminishing (e.g. the politician is corrupt). You may knowingly tolerate corrupt politicians in order to have some policy favorable to you implemented for sure (say, you care about ideology).

- “The idea is that voters vote strategically, and may vote for the dishonest but ideologically preferred candidate if they expect all other voters with the same ideology to do the same. Switching to the honest candidate risks giving the victory to a candidate on the other side of the ideological scale.”
- This is not a problem under PR where majority premia are small.

**Example:** Ideological voters in Tuscany (60 years voting for the same leftist party). Application: Kendall, Nannicini, Trebbi (AER 2015).



# Additional (Important) Features

- **Electoral Formula:** translates votes into seats. Additional (Important) Features Within PR, Mixed, and FPTP different formulae determine specific families of electoral rules (e.g. plurality differentiates into FPTP, TRS, AV, etc.). Sometimes this term also refers to other fine details within an electoral rule (D'Hondt method, Sainte-Lague method for allocation in PR etc.).
- **District Magnitude:** measures seats per political/geographic unit (i.e. the district). Example: In the US 1 representative is elected from 1 congressional district for the House (district magnitude is 1). However, for the Senate magnitude is 2 (2 Senators from each State). In Israel 120 representatives are elected from 1 district (which is the country itself). Lower district magnitude implies more individual accountability and lower proportionality. **Note: Not a measure of how many people in the district!**
- **Ballot Structure:** How citizens cast their preferences. Say, they can pick their candidate out of a list (open list) or can just select the party list ranking (closed list).

All these features do not necessarily co-vary in blocks. We lose a lot of information when discussing an electoral rule as a bundle without addressing the details.

# Evidence on Accountability

Since politicians tend to respond more to individual incentives than to collective incentives (Holmström, 1982, incentives in teams), systems that have party-list PR tend also to have politicians without much accountability.

In Persson, Tabellini and Trebbi (2003) we show that in cross-section **countries with party-list ballots tend to have higher political corruption** and rent seeking levels (controlling for a large set of country characteristics, including GDP per Capita, colonial and legal origin).

Estimates imply that plurality rule could reduce political corruption, by making politicians directly accountable to their constituency, by as much as 20%. (This is a large effect: Twice the coefficient of being a Latin American Country).

Persson, Tabellini and Trebbi (2003) also shows that **countries with large district magnitude (many representatives per district)** tend to have higher political corruption and rent seeking levels

# Evidence on Representation

When asked about the 2009 emergency bailout of financial institutions, several US congressmen opposing the bill cited as a reason the fact that bill did not have an [immediate beneficial effect on their constituency](#) (See Mian, Sufi, and Trebbi (2009)).

This should come as no surprise, since FPTP systems like the US tend to pull in the direction of narrowly targeted programs affecting very precise geographic regions (the congressional districts). There are many examples of government spending programs producing local benefits at diffused costs (e.g. Farm bill, Indian Gambling and Gaming Provisions).

Such programs are what we usually call pork-barrel programs (spending programs motivated by electoral motives). Cohen, Coval, and Malloy (JPE 2011) show large effects of appointments of senators to powerful committees; Bickers and Stein (1995); Berry et al. (2015).

# Evidence on Representation (cont.)

Also, in plurality systems parties have an incentive in targeting swing districts and pivotal districts and not those where the party is a sure winner.

On the other hand, multimember districts and PR systems tend to rely on broader groups of voters.

Consider the case of the Netherlands with a single multi-member PR district.

- There is no particular reason why a Dutch party should target voters in an area relative to another if all it matters is the national vote share.
- This is why PR systems will tend to prefer universalistic government programs (such as social security, pension programs or welfare programs) as opposed to localized targeted redistribution.
- **Empirical prediction:** Plurality systems should distort their fiscal policy towards more **targeted programs** and PR systems towards more **universalistic programs**.

# Evidence on Representation (cont.)

This prediction is verified by Milesi-Ferretti, Perotti, & Rostagno. (QJE 2002) and Persson and Tabellini (The Economic Effects of Constitutions, 2003).

- Milesi-Ferretti, Perotti & Rostagno show that targeted transfers are higher share of government expenditure in plurality systems.
- PR systems spend on average 2-3% of GDP more in social security and welfare than plurality systems.

The fact that in PR systems you have to please more voters than the pivotal set implies that government spending should be generally larger in PR systems relative to plurality systems.

Lizzeri and Persico (2001) also show that plurality rule may induce a systematic under- provision of public goods as opposed to localized pork-barrel projects.

We will see theoretical models of this in the following lectures (Persson and Tabellini, 2000).

# Additional Effects of Electoral Rules on Representation

So far, I have focused on differences in terms of fiscal policy, but there are also obvious effects of electoral rules on political outcomes.

- **Weak parties in plurality**; localized incentives tend to weaken parties vis-à-vis the individual representative because of often the politician's narrow interest will conflict with the interest of the majority of the other members of the party.
- PR tends to produce a **proliferation of parties** (in fact, certain formulae require thresholds for representation to limit such fragmentation.) Exceptions: South Africa post-Apartheid.
- **Plurality rules tend to under-represent small parties and converge towards polarized party systems**. This is because you need overcome large thresholds in at least one district small parties tend to disappear. Think about the green party and the third party in the US. Exception: if they have a very strong geographic component, (e.g. Bloc Quebecois). Over time, this
- reduces the number of parties much more than under PR (Duverger 1954, Lijphart 1990). Taagepera "Predicting Party Sizes: The Logic of Simple Electoral Systems" (2007).

# Additional Effects of Electoral Rules on Representation (cont.)

Duverger's (1954):

*“Simple-majority single-ballot [Plurality or First-Past-The-Post rule] favors the two party system” **whereas** “Simple Majority with a Second Ballot [dual-ballot or runoff] or Proportional Representation favors multipartyism.”*

Fujiwara (QJPS 2011): A Regression Discontinuity Test of Strategic Voting and Duverger's Law.

**Regression Discontinuity Design** in assignment of electoral rules in Brazilian municipalities' mayoral elections.

# Additional Effects of Electoral Rules on Representation (cont.)

Theoretical mechanism: Strategic voting.

## 1 Intuition

- **Sincere voting**: Voting own's preferences. Pick the candidate a voter likes the best in an electoral roster. In this case electoral rule does not matter.
- **Strategic voting**: Pick the candidates a voter likes the best weighted by their chance of electoral success. Electoral rule matters.

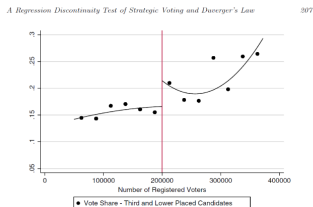
- ## 2
- Consider plurality rule and three candidates **A, B, C**. Suppose you are pivotal. You prefer candidate C to A & B, and A to B, but you are the only one who likes C in this system. A and B must be tied (we are considering the case you are pivotal & ties are solved by coin toss). Equilibrium: You will vote for A.
- ## 3
- Palfrey (1989); Myerson (2002); Myatt (2002); Bouton (2011). Under single ballot there exist an equilibrium where only the first two candidates receive all votes. But there are other equilibria, some with partial abandonment.



# Additional Effects of Electoral Rules on Representation (cont.)

The Brazilian constitution mandates that municipalities  $< 200,000$  registered voters use **Single-Ballot plurality rule** to elect their mayors, while Runoff rule if  $> 200,000$ .

Regression Discontinuity Design (Lee, 2008): Quasi-experiment. Balance on covariates. The data is dense enough around the treatment threshold (121 cities –with an 80-41 split- **observed repeatedly for the 1996-2008 period**) to draw precise estimates of the causal impact of the electoral rule on party structure.



**Figure 1.** Vote share of third and lower placed candidates — local averages and parametric fit.

# Additional Effects of Electoral Rules on Representation

Fujiwara (2011). As predicted by [Duverger's Law](#), a change from [Single Ballot](#) to runoff elections:

- 1 [Increases voting for the third placed](#) (& lower-placed) candidates by 8.8 ppt (from 15 ppt under Single Ballot);
- 2 [Decreases the vote margins between second & third and the vote margins between first & third placed candidates](#), while does not affect the margin between first and second placed candidates;
- 3 Results are [stronger in closely contested races](#), in which incentives to vote strategically in Single Ballot systems are higher.
- 4 Mayoral elections contemporaneous to council elections, but no change in rule for council at 200,000. [No change in skills of mayor or councilmen at threshold](#). Paper shows that these results are not likely driven by selection of different types of candidates across electoral systems.

Typical RDD caveat: 120 municipalities out of ~5000 in total. External validity.

# Additional Effects on Representation

A corollary of this is that often PR systems will **require coalitions of multiple parties**.

Intra-bargaining within coalitions and common-pool problems usually lead to **overspending**.

Particularly, the bargaining within a coalition will induce overspending if each party is a veto player (say, because it can destabilize the coalition).

- Veto players will be able to extract rents in the forms of inefficient programs.
- For an analysis of veto players see Tsebelis (2002).

Overspending usually drives up budget deficits. Alesina and Perotti (1995) discuss the evidence on how PR systems and coalition government tend to be more likely to run larger deficits.

Other evidence comes from Kontopoulos and Perotti (1999) and from an application to US municipal spending and city council size in Baqir (JPE 2002).

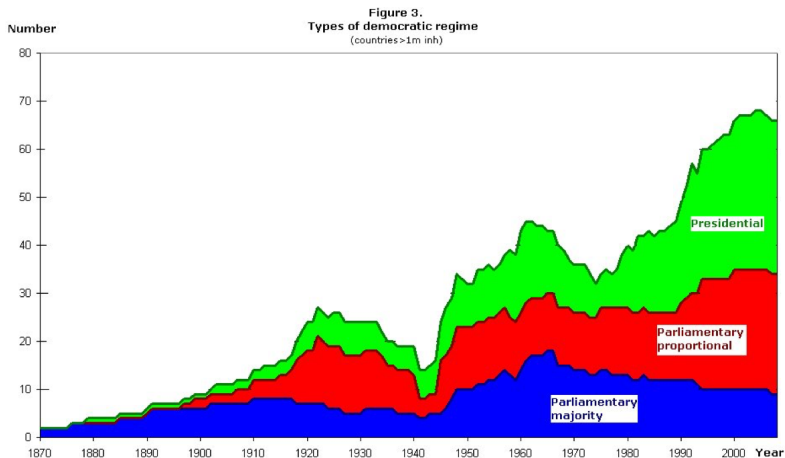
We will now briefly discuss another important institutional feature. Form of government.

Broadly, speaking we will restrict ourselves to two forms of government: Presidential versus Parliamentary Systems.

The main differences will revolve around the **type of constraints faced by the executive branch**.

This is the really **fundamental difference across political regimes**.

# Time Series (Democracies only)





# National Electoral Commission

## Sierra Leone Presidential Election

11 August 2007

Choose only ONE Candidate

Put a Mark inside the box next to the Candidate of your choice.

	Koroma, Ernest Bai		APC	<input type="checkbox"/>
	Turay, Andrew		CPP	<input type="checkbox"/>
	Jalloh, Alhaji Amadu		NDA	<input type="checkbox"/>
	Conteh, Kandeh Baba		PLP	<input type="checkbox"/>
	Margai, Charles F		PMDC	<input type="checkbox"/>
	Berewa, Solomon E		SLPP	<input type="checkbox"/>
	Karim, Abdul Kady		UNPP	<input type="checkbox"/>

# Electoral Constraints of the President

A presidential regime is characterized by a popularly elected president (directly or indirectly).

An explicit electoral mandate legitimizes the president. Under a presidential regime, it is possible to decouple the electoral constraints of the executive from those of the legislative.

No stable majority in the legislative is needed to support the executive (e.g. divided government is possible).

On the other hand, within a parliamentary regime the executive is expression of the legislative. The majority party (say, under Westminster-type regimes) or a coalition of parties selects a prime minister in charge of policymaking.

In a parliamentary regime, the executive is accountable to voters only indirectly, through the legislative.

# Accountability through Motion of Confidence

The lack of direct electoral accountability in parliamentary regimes requires an alternative form of checks and balances: **The confidence (nonconfidence) motion.**

A prime minister is subject to maintaining the confidence (majority of support) of the legislative chambers.

- The executive loses power if the legislative loses power.

Two main consequences:

- 1 **Makes the electoral term endogenous to the policy** (decreasing the insulation of the executive under parliamentary regimes).
- 2 Allows for policy adjustment during the legislature and **increases legislative cohesion** (motivated by the incentives not to lose valuable agenda-setting power by the governing coalition).



# Trade-offs in the Form of Government

Another typical characteristic of presidential regimes is [strength of legislative proposal](#) and the [veto power over legislation](#). In general, presidential regimes have [stronger executives](#) (Shugart and Carey (1992)).

This induces a strong trade-off between ability of presidential government to implement reform through insulation from the legislative and reduction of accountability.

Alesina and Rosenthal (1995) show how the US midterm elections may play a role in reducing such constraints through changes in Congressional strength opposition as a way of finding middle of the road compromises ([the divided government hypothesis](#)).

# Stability the Form of Government

There is a heated debate in the comparative politics literature on the stability of form of governments. Particularly, the [fragility of presidential regimes to autocratic rule](#).

Lijphart (1999); Linz (1978); Linz and Stepan (1978); Shugart and Carey (1992) all discuss the virtues of parliamentary regimes in terms of higher stability.

It is the [winner-takes-all](#) component of presidentialism that most likely makes it prone to be the form of government of choice of autocratic regimes. Also, the [strong concentration of legislative powers in the hands of the executive branch](#). Parliamentary systems are more consensual by design.

Strong evidence in West Sub-Saharan Africa starting from the 1970's: Changes towards strong presidentialism from hybrid systems (like France's: a president *and* a prime minister, sometimes of different parties) and parallel curbing of political rights. Also think of the evolution of Russia's semi-presidential system.

# Form of Government in Local Governments

Parliamentarism is also a feature of sub-national political systems.

- For instance, mid-sized US cities are often managed by a council-manager form of government as opposed to a strong mayor system.
- This institution was developed first in the US South during the progressive era.
- In a council-manager form of government, the council hires a city manager who then implements the policy. The city manager serves at the will of the council.
- Strong mayors are directly elected by the voters in parallel to the city council and typically have large budgetary and policy autonomy.

See International City-council Manager Association survey data here:

<http://icma.org/en/press/bookstore>

# SOME THEORETICAL FORMALIZATION

# Electoral Accountability and Electoral Rules

Persson and Tabellini (2000, ch. 9.2)

Consider a political system with one incumbent politician and  $N$  identically sized groups of voters, indexed by  $J$ .

Voters in group  $J$  get utility from consumption  $c^J$  and a general public good  $g$

$$U^J = c^J + H(g)$$

where  $H$  has standard properties ( $H' > 0$ ,  $H'' < 0$ ). Let us assume that voters consume all disposable income so:

$$U^J = y - \tau + f^J + H(g) \quad (1)$$

Where  $y$  is income,  $\tau$  indicates taxes, and  $f^J$  denotes a non-negative lump sum transfer to members of group  $J$ .

# The Politician: Public goods and Rents

As in Topic 1 the politician (i.e. the government) employs tax revenues to produce the public good, but can also appropriate part of the revenues as private rents  $r$ .

The production of public good  $g$  entails a cost of transforming private goods into public goods of  $\theta$ , a random variable whose realization is common knowledge.

Then, the government budget constraint is:

$$\theta g = N\tau - r - f \quad (2)$$

Where  $f = \sum_J f^J$ .

# The Politician: Public goods and Rents

Notice that we are enriching our setting.

We are introducing potential conflict among voters over redistributive transfers  $f^J$ .

In a second, we will also introduce details on the electoral rule and check what are the consequences in terms of political accountability and redistribution.

# The Politician: Public goods and Rents (cont.)

As in Part I of Topic 1, the politician enjoys (exogenous) rents from being in office  $R$ . The politician can obtain  $R$  only if elected, which happens with reelection probability  $p$ .

Preferences of politicians are then given by:

$$\gamma r + pR \quad (3)$$

Where  $\gamma < 1$  reflects the fact that politicians face some transaction cost in extracting private rents.



# Timing of the game

## Sequential Structure:

- 1 State of  $\theta$  is realized.
- 2 Voters pick a retrospective voting rule  $p$
- 3 Incumbent chooses the policy vector  $[\{f^J\}, g, r, \tau]$
- 4 Elections are held.

## Recall: Our solution without transfers (Part 1)

Voters coordinate on the same retrospective voting strategy:

$$\begin{aligned} p &= 1 \text{ if } U(g(\theta), r(\theta)) > k(\theta) \\ &= 0 \text{ otherwise} \end{aligned} \tag{4}$$

Where  $k(\theta)$  indicates the voter's reservation utility.

The politician has two strategies at stage (3).

- **Steal everything** setting  $g^* = 0$ ,  $\tau^* = y$  and rents  $r^* = Ny$ .
- **Please the voters and earn reelection.** The incumbent does so at the minimum cost, so it provides them with their reservation utility  $k(\theta)$  to obtain  $p = 1$ .

## Recall: Our solution without transfers (cont.)

- The politician will be pleasing the voters if her utility is higher doing so  $\gamma r + R \geq \gamma N y$
- Voters will require the above condition to hold with equality, so:  
 $r^* = \text{Max}[0, Ny - R/\gamma]$

Voters will optimally set their reservation utility to

$$k^*(\theta) = y - (\theta g^*(\theta) + r^*)/N + H(g^*(\theta))$$

where the cost of producing the optimal amount of public good is  $\theta g^*(\theta)$  and taxes are  $\tau^* = (\theta g^*(\theta) + r^*)/N$

# Case 1: Single-District Elections

- The incumbent runs for office against an identical opponent.
- Proportional representation in a single-district, two party system.
- Needs only a minimum winning coalitions of  $N/2$  groups of voters to win.
- Equilibrium breaks down immediately.

Any intuition why?

## Case 1: Single-District Elections (cont.)

Suppose the incumbent is facing a decision rule like (4).

She will play the groups of voters one against the other and get them to set their reservation utility so low, she basically fully expropriates all voters.

Suppose in fact at stage (3) the politician sets  $\tau = y$  and sets positive  $\{f^j\}$  for  $N/2$  voters so to maintain a majority satisfied at  $k^*(\theta)$ .

This is feasible and the politician can increase rents this way (**see next slide for proof**).

## Case 1: Single-District Elections (cont.)

### Proof:

For the lucky majority,

$f^J + H(g^*(\theta)) = k^*(\theta) = y - (\theta g^*(\theta) + r^*)/N + H(g^*(\theta))$ , which makes new total rents  $Ny - f^J N/2 - \theta g^*(\theta)$ .

New rents are always larger than  $r^*$ , under our original assumption that to begin with  $r^*$  left enough revenue for optimal public good level  $g(\theta)$  in every state  $\theta$ ,  $\theta g^*(\theta) \leq R/\gamma$ .

[Actually, the politician could even underprovide the public good (below  $g^*$ ), get even larger rents and still make it. So this is *a fortiori* valid].

## Case 1: Single-District Elections (cont.)

But now notice that everybody is taxed, while transfers reach only a lucky (minimum winning) majority.

This strategy cannot be an equilibrium for those left out of the minimum winning coalition (i.e. the cheapest coalition for the incumbent to buy).

They will bid down their reservation utility below  $k^*(\theta)$  in order to be included in the minimum winning coalition.

It becomes a race to the bottom.

## Case 1: Single-District Elections (cont.)

In fact, the new equilibrium of this game requires an additional condition.

If group  $J$  chooses reservation utility  $k^{*J}(\theta)$ , then it must be a best response to  $k^{*I}(\theta)$  for all  $I \neq J$ .

Groups play Nash among each other (while voters still cooperate within the group).



## Case 1: Single-District Elections (cont.)

The new equilibrium must satisfy:

- 1 Voters must not be so demanding that the incumbent is better off foregoing reappointment in office
- 2 The equilibrium policy must be optimal for the incumbent, and she will only please a simple majority of the voters (no resources wasted on supermajorities)
- 3 No group of voters can benefit from an unilateral change in its reservation utility, given the reservation utility of the other groups

## Case 1 Equilibrium

The new equilibrium must satisfy for at least a minimum winning coalition  $N/2$

$$y - \tau + f^J + H(g) \geq k^{*J}(\theta)$$

This makes new total rents for the incumbent equal to tax revenues less government spending

$$N\tau - f - \theta g(\theta),$$

which she will maximize for  $\{f^J\}$ ,  $\tau$ , and  $g$  subject to

$$\tau \leq y, 0 \leq f, y - \tau + f^J + H(g) \geq k^{*J}(\theta) \text{ for } N/2 \text{ voters}$$

# Solution: Taxes

In order to maximize rents, the incumbent will fully expropriate voters.

Taxes will be at the **highest possible level** in equilibrium:  $\tau^{**} = y$

To see why, consider that voters are pitted against each other and cannot block total expropriation.

Since taxes and transfers are perfect substitutes in voters' preferences, the incumbent can always increase taxes on everybody by  $\Delta\tau$  and **redistribute it to only  $N/2$  groups through transfers**.

This means that any excluded voter will bid down his reservation utility by accepting higher and higher taxes in order to be included in the minimum winning coalition.

# Solution: Public Good

What is the level of  $g$  that the incumbent will choose?

Will she be able to set  $g = 0$ ?

[Note: Given the incumbent receives no utility from  $g$ , 0 is what she would pick, were she unconstrained by inequality (4)].

Let us start from our socially optimal level of public good provision. The optimal level of  $g$  is pinned down by the *Samuelsonian criterion*  $NH'(g) = \theta$  (i.e. the sum of the marginal benefit of agents should be equal to the social marginal cost)

# Solution: Public Good

Suppose the incumbent deviates and lowers the public good level by a tiny  $\Delta g$ .

She would release an amount of revenues equal to  $\theta \Delta g$ . She would also reduce utility of each voter by

$$H(g) - H(g - \Delta g) = \Delta g \times H'(g) = \Delta g \times \theta/N.$$

Compensating  $N/2$  voters for their loss will cost the incumbent  $N/2 \times \Delta g \times \theta/N = \theta \Delta g/2$  which leaves additional rents  $\theta \Delta g/2 > 0$ .

*So, the incumbent will start lowering  $g$  below the optimal Samuelsonian level for sure. But when is the politician going to stop? At 0?*

## Solution: Public Good (cont.)

The marginal utility of  $g$  is decreasing ( $H$  is concave), so it becomes increasingly costly to compensate voters for their loss of public goods.

Suppose now the supply of  $g$  has decreased all the way down to the point where  $NH'(g) = 2\theta$ .

Suppose the incumbent lowers the public good level again by another tiny  $\Delta g$ .

She would release an amount of revenues equal to  $\theta \Delta g$ .

She would also reduce utility of each voter by  
 $H(g) - H(g - \Delta g) = \Delta g \times H'(g) = \Delta g \times 2\theta/N$ .

## Solution: Public Good (cont.)

Compensating  $N/2$  voters for their loss will cost the incumbent  $N/2 \times \Delta g \times 2\theta/N = \theta \Delta g$  which leaves 0 additional rents.

*So, the incumbent will not lower  $g$  below this point, because compensating voters will become too expensive below this point!*

Such deviations will be no longer profitable.

The new equilibrium level of  $g^{**}$  is therefore at the level satisfying:

$$NH'(g) = 2\theta$$

# Solution: Transfers

Since all voters must play best response, the voters receiving transfers must not be better off than those receiving some transfer.

In fact, they all must receive the same reservation utility  $k^{*J}(\theta)$ . But since all receive utility from the public good and are taxed equally, then transfers cannot be different depending on  $J$  being in the majority or not.

In equilibrium  $f^J = 0$  for all  $J$ .

This makes new total rents for the incumbent equal to tax revenues less government spending  $r^{**} = Ny - \theta g^{**}$



## Case 1: Equilibrium Discussion

Notice that the voters (any half of them) can still kick the politician out of office, so she cannot just set  $g = 0$ .

This is interesting because even if transfers have pitted voters one against the other, the indivisibility of the public good allows voters to set their reservation utility contingently on a measure of “aggregate performance”  $g$ .

Some accountability remains! But it is lower than in the case where redistributive transfers were not allowed.

Notice that in equilibrium transfers are not employed, but the very threat of using them strongly decreases accountability of the incumbent vis-à-vis voters.

# Case 1: What would happen if $X$ voters could coordinate?

So far we have assumed groups of voters could not coordinate.

We will now briefly extend the model to allow for a subset of the groups to form a coordinated group of size  $X$ .

You can alternatively consider this to be an extension with groups of heterogeneous sizes.

We will consider two possibilities:

a)  $X > N/2$

b)  $X < N/2$

We will see how group size and political power will relate to each other.

Persson and Tabellini (2000, ch. 9.5 – problem 3)

# $X > N/2$ voters coordinate

A candidate needs at least  $1/2$  the votes, so to win the incumbent needs the support of group  $X > N/2$ . Group  $X$  is necessary for reelection: pivotal and not fungible.

Since group  $X$  can coordinate, it can demand its maximum payoff given the incumbent's participation constraint.

Recall that the incumbent's participation constraint was found by considering that the politician has two strategies at stage (3):

- **Steal everything** setting  $g^* = 0$ ,  $\tau^* = y$  and rents  $r^* = Ny$ .
- **Please the voters and earn reelection.** The incumbent does so at the minimum cost, so it provides them with their reservation utility  $k(\theta)$  to obtain  $p = 1$ .
- The politician will be **pleasing the voters if her utility is higher** doing so  
 $\gamma r + R \geq \gamma Ny$
- To minimize rents paid to the incumbent, for any  $\theta$ , group  $X$  will require  
 $r^* = \text{Max}[0, Ny - R/\gamma]$

## $X > N/2$ voters coordinate (cont.)

Given  $r^*$  group  $X$  will maximize its utility:

$$\begin{aligned} & \max \left\{ \sum_{J \in X} f^J + XH(g) \right\} \\ & \text{subject to } \theta g = Ny - r^* - \sum_{J \in X} f^J \end{aligned}$$

which is solved for  $[\{f^J\}, g]$  using FOC:

$$XH'(g^*(\theta)) = \theta$$

$$f^J(\theta) = (Ny - r^* - \theta g^*(\theta))/X \text{ for all } J \in X$$

## $X < N/2$ voters coordinate (cont.)

A candidate needs at least  $1/2$  the votes, but now to win the incumbent does not need the support of group  $X < N/2$  necessarily. Group  $X$  isn't necessary for reelection and is fungible with any other group summing up to  $N/2$ .

Even if group  $X$  can coordinate, the competition with other groups of voters will bring us back to a situation where the incumbent can pit groups against each other.

Case 1 results will apply to this case and taxes will be the maximum, transfers will be zero, and public goods will be underprovided.

# Case 1: What would happen if $X$ voters could coordinate?

The political power of an electorally pivotal group  $X > N/2$  is such that the incumbent is kept to her minimal rents.

However, in this model there is a sharp discontinuity when we consider the political power of an electorally nonpivotal group  $X < N/2$

In the latter case, the incumbent extracts her maximal rents!

## Case 2: Multiple-District Elections

The incumbent runs for office against an identical opponent.

$M$  multiple districts with plurality rule in each district, two party system.

Each district is identical. In each district all groups are represented in amount  $N/M$ . So total number of groups is still  $N$ .

In order to control the legislative are necessary  $M/2$  districts to win.

# Case 2: Example

$N = 3$

*SINGLE-DISTRICT PR*



$M = 2$

*MULTIPLE-DISTRICT FPTP*





## Case 2: Example (cont.)

*SINGLE-DISTRICT PR: WHAT MATTERS ARE AT-LARGE SHARES*



*MULTIPLE-DISTRICT FPTP: WHAT MATTERS ARE SHARES WITHIN DISTRICTS*



## Case 2: Multiple-District Elections (cont.)

In order to control the legislative,  $M/2$  districts are necessary.

But to win a district is necessary to convince only  $\frac{1}{2}N/M$  voters.

This implies that the total number of voters necessary to win the election is no longer  $N/2$

The total number of voters necessary to win is now  $M/2 * N/2M = N/4$ .

## Case 2: Multiple-District Elections (cont.)

This clearly does not bode well for the voter groups, that now are going to be pitted against each other with an even worst constraint since each group is split across  $M$  different districts.

The new equilibrium must satisfy for at least a minimum winning coalition  $N/4$

$$y - \tau + f^J = H(g) \geq k^{*J}(\theta)$$

What changes relative to Case 1? Public good provision will be even lower!  
**Let's show it.**

# Solution: Public Good

Suppose the supply of  $g$  is at the point where  $NH'(g) = 2\theta$ . *This pinned down the equilibrium amount of  $g$  in Case 1.*

Suppose the incumbent lowers the public good level again by a tiny  $\Delta g$ .

She would release an amount of revenues equal to  $\theta \Delta g$ .

She would also reduce utility of all voters by  
 $H(g) - H(g - \Delta g) = \Delta g * H'(g) = \Delta g * 2\theta/N$ .

## Solution: Public Good (cont.)

Compensating  $N/4$  voters for their loss will cost the incumbent  $N/4 * \Delta g * 2\theta/N = \theta\Delta g/2$  which leaves  $\theta\Delta g/2 > 0$  additional rents.

*So the incumbent will now have a **profitable deviation** relative to Case 1.*

The new equilibrium amount of  $g$  in Case 2 will be given by  $NH'(g) = 4\theta$ .

# Solution: Taxes and Rents

The equilibrium solution is identical to Case 1.

Since the new equilibrium amount of  $g^{***}$  is given by  $NH'(g) = 4\theta$ , this implies a lower level of public good than under Case 1 since  $H'(g)$  is decreasing ( $H(g)$  is concave).

Given that the incentives to fully expropriate voters ( $\tau = y$ ) remain identical to the proportional representation case, this also implies higher rents for the politician ( $r = Ny - \theta g^{***}$ ).

## Next: Electoral Competition

*Persson and Tabellini (2000, ch. 8.1-8.4)*

So far, we have considered the issue of electoral accountability and how electoral rules under a single-district (PR) versus multiple-district plurality electoral rule can change the rents of politicians and the provision of public goods.

We now consider the issue of **how two opportunistic and rent-seeking political candidates will interact and compete with each other.**

# Electoral Competition and Electoral Rules

Consider a political system with two competing candidates ( $A$  and  $B$ ) running for election and  $N = 3$  identically sized groups of voters, indexed by  $J$ .

Voters in group  $J$  get utility from government policy in the form of consumption  $c^J$  and a general public good  $g$

$$u^J = c^J + H(g)$$

where  $H$  has standard properties ( $H' > 0$ ,  $H'' < 0$ ). Let us assume that voters consume all disposable income so:

$$u^J = 1 - \tau + f^J + H(g) \quad (5)$$

Where  $y = 1$  is income,  $\tau$  indicates taxes, and  $f^J$  denotes a non-negative lump sum transfer to members of group  $J$ .



# The Politician: Public goods and Rents

As in our analysis of electoral accountability, politicians (i.e. the government) can employ tax revenues to produce the public good, but can also appropriate part of the revenues as private rents  $r$ .

The production of public good  $g$  entails a cost of transforming private goods into public goods equal to 1. ( $\theta = 1$ . No uncertainty about it.)

The government budget constraint is:

$$g = 3\tau - r - f \quad (6)$$

Where  $f = \sum_J f^J$ .

# Timing of the game

Sequential structure:

- 1 The two candidates  $A$  and  $B$  commit to policy platforms  $q_A = [\{f_A^J\}, g_A, r_A, \tau_A]$  and  $q_B = [\{f_B^J\}, g_B, r_B, \tau_B]$  respectively, conditional on ex ante electoral preferences. They act simultaneously and do not cooperate.
- 2 Preference shocks realize. Elections are held.
- 3 The winning policy vector is implemented.

# The Candidate

As in Topic 1, the politician enjoys exogenous rents from being in office  $R$  and endogenous rents  $r$ .

In this model a candidate can **only** obtain  $R$  and  $r$  if elected, which happens with (endogenous) election probability  $p$ .

Preferences of politicians are then given by the **expected value of victory**:

$$E(v) = p(\gamma r + R) \quad (7)$$

Where  $\gamma < 1$  reflects the fact that politicians face some transaction cost in extracting private rents.

# Probabilistic Voting

We assume **probabilistic voting**.

**Probabilistic Voting** In a unidimensional policy space Downs' (1957) traditional electoral competition model shows that two candidates (who can, by assumption, commit to specific platforms, like here) converge to the same platform and both candidates select the policy preferred by the pivotal voter.

**In a multidimensional policy space** (like here) **if no policy dominates any other policy, cycling can occur and we can end up with no equilibria** (i.e. given some policy choice by the adversary, a candidate can always rearrange some policy dimensions to capture a winning coalition of voters and win). **ISSUE:** The function linking policy choice and electoral results is (very) discontinuous.

**In order to avoid this discontinuity, some uncertainty about the mapping from policy choice to electoral results is introduced [from the candidates' viewpoint].**

Probabilistic voting indicates a class of models characterized by uncertainty about electoral outcomes. Electoral support becomes a smooth function of the policy platform. Nash equilibria usually exist.

# Electing a Candidate

We assume that the election outcome is uncertain at the moment of deciding about policy (there is electoral uncertainty at stage 1). **Uncertainty about voters' preferences.**

In equation (5), we have assumed that voters are identical with respect to preferences for policy. In order to introduce uncertainty, we add that voters are heterogeneous with respect to preferences for politicians for ideological reasons.

Define  $U^J(q)$  as the indirect utility obtained by replacing equation (6) into (5).

Voter  $i$  in group  $J$  votes for candidate  $A$  if:

$$U^J(q_A) > U^J(q_B) + (\delta + \sigma^{J,i}) \quad (8)$$

Where  $\delta + \sigma^{J,i} \leq 0$  or  $\geq 0$  indicates the voter's ideological preference for candidate  $B$ . Notice that it depends on a common value  $\delta$  and an idiosyncratic component  $\sigma^{J,i}$ .

NOTE: In case you wondered, sincere/strategic voting not an issue here: it is a two-candidate race.

# Electing a Candidate (cont.)

- The idiosyncratic component  $\sigma^{J,i}$  is different for each group  $J=1,2,3$  and is Uniform over the interval  $[-1/(2w^J) + \sigma^J, 1/(2w^J) + \sigma^J]$ . The group-specific mean  $\sigma^J$  indicates the average ideology of the group. Candidates know these group-specific distributions when they pick policies.

Groups differ in their ideological homogeneity. The higher  $w^J$ , the lower the group-specific variance of  $\sigma^{J,i}$  – a tighter density.

- We assume that the common shock  $\delta$  has a Uniform distribution on  $[-1/(2z), 1/(2z)]$ .

Notice that the higher  $z$ , the lower the variance of  $\delta$  – a tighter density.

Uncertainty about  $\delta$  resolves at stage 2, right before elections are held.

Think about  $\delta$  as an aggregate popularity shock (some last-minute electoral scandal, like Spain on 3/11/2003).

# Electing a Candidate (cont.)

*Assumption 1:* Groups are ranked based on their average ideology  $\sigma^J$  :

$$\sigma^1 < \sigma^2 < \sigma^3$$

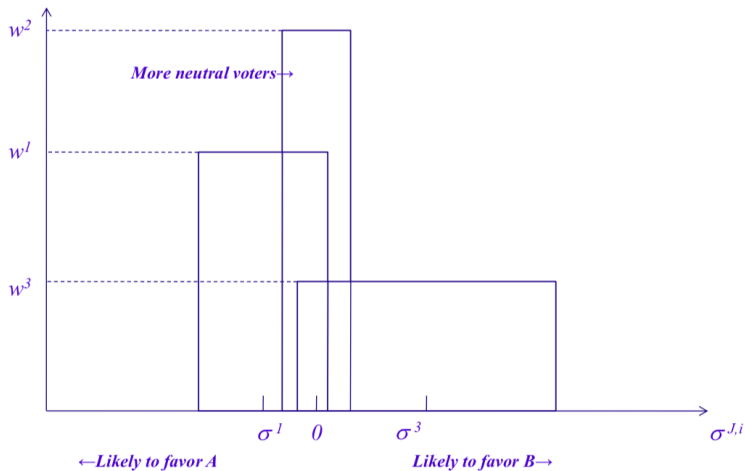
Let us set  $\sigma^2 = 0$  as a normalization.

*Assumption 2:* Assume group 2 has the highest density (it's the most homogenous):

$$w^2 > w^1, w^3$$

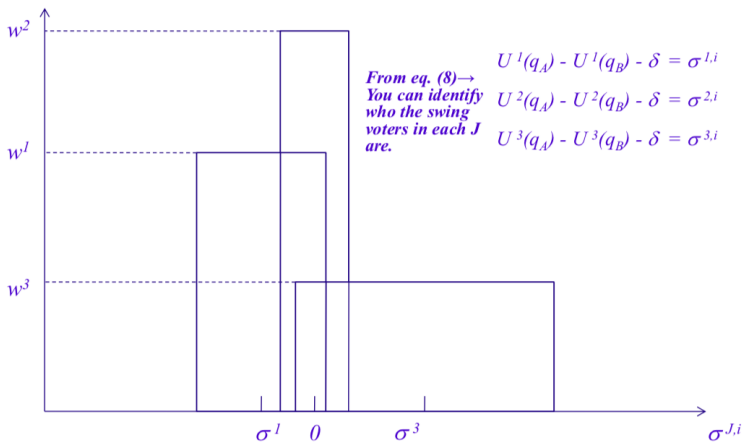
*Assumption 3:* Finally, for analytical convenience (but negligible for the gist of our results) assume also that  $\sigma^1 w^1 + \sigma^3 w^3 = 0$

# Ideological preferences for $B$

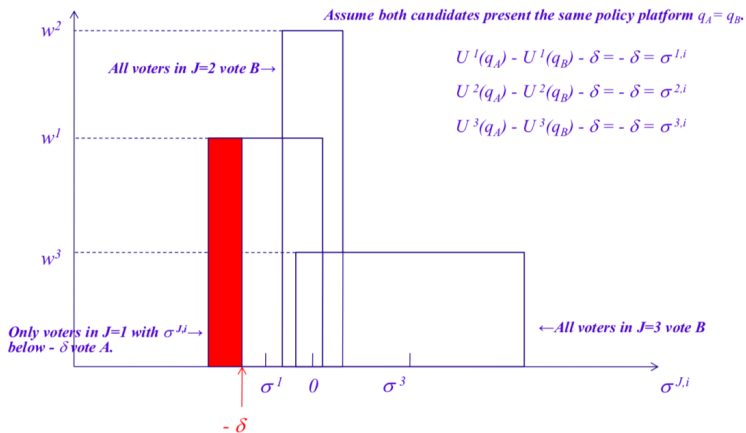




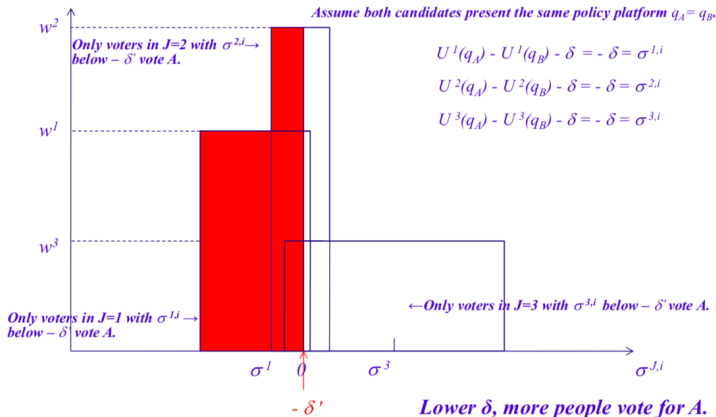
# Swing Voters for Candidate $B$ in the Three Districts



# Who votes for A?



# What happens if the average ideological preference for $B$ declines?



# Candidate's Strategies

Assume candidates  $A$  and  $B$  start from the same policy platforms.

If candidate  $A$  decides to offer a policy with higher public good provision  $g$  she will increase her electoral prospects in  $J = 1, 2, 3$

All swing voters move right.

This is a symmetric effect across all districts for any realization of  $\delta$ .

$$U^1(q'_A) - U^1(q_B) - \delta > -\delta = \sigma^{1,i}$$

$$U^2(q'_A) - U^2(q_B) - \delta > -\delta = \sigma^{2,i}$$

$$U^3(q'_A) - U^3(q_B) - \delta > -\delta = \sigma^{3,i}$$

*Q: What happens if candidate  $A$  decides to lower her rents  $r$ ? What if she raises  $\tau$ ?*

# Candidate's Strategies (cont.)

Assume candidates  $A$  and  $B$  start from the same policy platforms.

If candidate  $A$  decides to offer a policy with higher targeted transfers to group 1 at the expense of group 3, she will increase her electoral prospects in  $J = 1$ , while she will decrease her support in  $J = 3$ .

The identity of the swing voter in group 1 moves right, the swing voter in 3 moves left.

This is an asymmetric effect across districts for any realization of  $\delta$  (which is common):

$$U^1(q_A'') - U^1(q_B) - \delta > -\delta = \sigma^{1,i}$$

$$U^2(q_A) - U^2(q_B) - \delta = -\delta = \sigma^{2,i}$$

$$U^3(q_A'') - U^3(q_B) - \delta < -\delta = \sigma^{3,i}$$

# Who votes for $A$ ?

Vote share of candidate/party  $A$  in district  $J$  is the CDF up to the swing voter in  $J$  :

$$\begin{aligned}\pi^{J,A} &= w^J[(U^J(q_A) - U^J(q_B) - \delta) - (-1/(2w^J) + \sigma^J)] \\ &= 1/2 + w^J[U^J(q_A) - U^J(q_B) - \delta - \sigma^J]\end{aligned}\tag{9}$$

Obviously, the vote share of candidate/party  $B$  in district  $J$  is its complement,  $1 - \pi^{J,A}$

# Case 1: Single-District Elections

We have described how to compute electoral support for candidates.

Let's now check the **consequences of different electoral rules in presence of competition**.

- Proportional representation in a single-district, two-party system.
- Seats allocated in perfect proportion to votes.
- Needs a minimum winning coalitions of  $1/2$  voters to win  $1/2$  seats and the right to set the policy vector  $q$ .

*Q: What is the probability that candidate  $A$  wins and sets the policy under single-district PR?*

# Case 1: Single-District Elections

The probability that candidate  $A$  is elected and sets the policy is:

$$p^A = \Pr[1/3 \times \sum_J \pi^{J,A} \geq 1/2]$$

And using (9) we get:

$$\begin{aligned} p^A &= \Pr[1/3 \times \sum_J \{1/2 + w^J [U^J(q_A) - U^J(q_B) - \delta - \sigma^J]\} \geq 1/2] \\ &= \Pr[1/3 \times \sum_J \{w^J [U^J(q_A) - U^J(q_B) - \sigma^J]\} \geq w \times \delta] \end{aligned}$$

where set  $w = 1/3 \times \sum_J w^J$ . Recalling that  $\sum_J w^J \sigma^J = 0$ , and using the uniformity assumption of  $\delta$ , this further simplifies to the expression:

$$p^A = 1/2 + \frac{z}{3w} \times \sum_J \{w^J [U^J(q_A) - U^J(q_B)]\} \quad (10)$$



# Case 1: Equilibrium

A solution entails realizing that the problems for candidate A and B are symmetric.

$$p^B = 1 - p^A = 1/2 + z/(3w) \times \sum_J \{w^J [U^J(q_B) - U^J(q_A)]\}$$

This is the specific result of the assumption  $\sum_J w^J \sigma^J = 0$ . That assumption is the combination of group 2 being symmetric around 0 and that group 1 and 3 are symmetrically balancing each other around 0 in terms of mass of voters.

- To see this last point, consider that if  $\sigma^1 w^1 + \sigma^3 w^3 = 0$ , the number of voters in group 1 below zero  $w^1[0 - (-1/(2w^1) + \sigma^1)]$  is the same as the number of voters in group 3 above zero  $w^3[(1/(2w^3) + \sigma^3) - 0]$ .

This symmetry is not general, but depends on specific assumptions for the three groups' positions.

Nonetheless, in this symmetric case it will not be a surprise then that the two candidates choose the same policy in equilibrium.

## Case 1: Equilibrium (cont.)

We can find the equilibrium policy by considering the policy maximizing the expected value of victory by  $A$ :

$$E(v^A) = p^A(\gamma r + R) \quad (7)$$

with respect to  $q^A$ , taking  $q^B$  as given, and subject to:

$$u^J = 1 - \tau + f^J + H(g) \quad (5)$$

$$g = 3\tau - r - \sum_J f^J \quad (6)$$

$$p^A = 1/2 + z/(3w) \times \sum_J \{w^J [U^J(q_A) - U^J(q_B)]\} \quad (10)$$
$$\tau \leq 1$$

## Case 1: Equilibrium (cont.)

By substituting in equations (5), (6), and (10)

$$E(v^A) = \left( 1/2 + z/(3w) \times \sum_J \{ w^J [1 - (f_A^1 + f_A^2 + f_A^3 + g_A + r_A)/3 + f_A^J + H(g_A) - U^J(q_B)] \} \right) \times (\gamma r_A + R)$$

Maximized with respect to  $[\{f_A^J\}, g_A, r_A, \tau_A]$ , and taking  $q_B$  as given.

Finally, the first order conditions will have to be evaluated at the point where  $q_A = q_B$ .

## Case 1: FOC

The first order conditions with respect to government spending & rents are:

$$\begin{aligned}\partial E(v^A)/\partial g_A &= \partial p_A/\partial g_A \times (\gamma r_A + R) \\ &= z/(3w) \times \sum_J \{w^J - 1/3 + H'(g_A)\} \times (\gamma r_A + R) = 0\end{aligned}$$

$$\begin{aligned}\partial E(v^A)/\partial r_A &= \partial p_A/\partial r_A \times (\gamma r_A + R) + p_A \gamma \\ &= z/(3w)(-w) \times (\gamma r_A + R) + \gamma p_A = 0\end{aligned}$$

## Case 1: FOC (cont.)

The first order conditions with respect to transfers are:

$$\partial E(v^A)/\partial f_A^1 = \partial p_A/\partial f_A^1 \times (\gamma r_A + R) = z/3w \times (w^1 - w) \times (\gamma r_A + R) \geq 0$$

$$\partial E(v^A)/\partial f_A^2 = \partial p_A/\partial f_A^2 \times (\gamma r_A + R) = z/3w \times (w^2 - w) \times (\gamma r_A + R) \geq 0$$

$$\partial E(v^A)/\partial f_A^3 = \partial p_A/\partial f_A^3 \times (\gamma r_A + R) = z/3w \times (w^3 - w) \times (\gamma r_A + R) \geq 0$$

Notice that these three first order conditions cannot all hold with equality simultaneously, inducing corner solutions. In particular, *the net marginal gain from transferring money to group 2 will always be positive and the highest of the three since  $w^2 - 1/3 \times \sum_J w_J = w^2 - w > 0$  (recall Assumption 2).*

This implies:

- 1 dollar of revenues is better invested in a transfer to group 2 (the swing group) than to any other group because it delivers more extra votes, implying  $f_A^2 > 0$ ,  $f_A^1 = f_A^3 = 0$  ;
- $w^2 > w$  also implies that 1 dollar of revenues has a marginal electoral benefit (i.e. redistributing transfers to group 2 gaining at rate  $w^2$ ) larger than its marginal electoral cost (i.e. increasing taxes on all, losing votes at rate  $w$ ). This means maximal taxes,  $\tau_A = 1$ .

# Case 1: Equilibrium Conditions

How do we find the equilibrium levels of public goods & rents?

- Equalize the net marginal gain from one extra unit of public good (increasing the probability of winning) to the net marginal gain from transferring resources to group 2 (this also increases the probability of winning).
- Equalize the net marginal gain from one extra unit of rents (this decreases probability of winning but increases utility from being in office) to the net marginal gain from transferring money to group 2 (increases the probability of winning).

$$\partial E(v^A)/\partial g_A = \partial E(v^A)/\partial f_A^2 \rightarrow \sum_J \{w^J H'(g_A)\} = w^2 \quad (11)$$

$$\partial E(v^A)/\partial g_A = \partial E(v^A)/\partial f_A^2 \rightarrow \gamma p_A = z/3w \times w^2 \times (\gamma r_A + R) \quad (12)$$

## Case 1: Equilibrium Conditions (cont.)

Equalizing the net marginal gain from one extra unit of public good to the net marginal gain from transferring money to group 2 gives you the equilibrium amount of public good provided  $g_A^*$ . Simplify equation (11) to see it:

$$H'(g_A) = w^2/3w > 1/3$$

[The last inequality implies that the public good is underprovided relative to the socially optimal Samuelsonian level determined by  $3H'(g) = 1$ ]



## Case 1: Equilibrium Conditions (cont.)

Equalizing the net marginal gain from one extra unit of rents to the net marginal gain from transferring money to group 2 (equation 12) gives:

$$\gamma(1/2 + z/(3w)) \times \sum_J \{w^J [1 - (f_A^2 + g_A + r_A)/3 + f_A^J + H(g_A) - U^J(q_B)]\} = z/3w \times (w^2) \times (\gamma r_A + R)$$

Which, jointly with the government budget constraint (6) & the solution  $g_A^*$ , delivers both  $f_A^{2*}$  and  $r_A^*$

*Even easier: You can plug in the equilibrium condition  $p_A = p_B = 1/2$  into eq. (12) and check that rents can be positive in equilibrium:*

$$\gamma/2 = z/3w \times (w^2) \times (\gamma r_A + R)$$

With  $r_A \geq 0$

# Case 1 Discussion

A Nash equilibrium is determined by equal policy choice by both candidates.

Hence we have fully characterized the political equilibrium.

- Result 1: Political competition does not necessarily reduce political rents to 0. This is because the two candidates are not perfect substitutes and preferences about who is in power are idiosyncratic (recall there's a component of utility that comes from ideology).
- Result 2: The larger the density of swing voters  $w^2$ , the lower the level of equilibrium rents  $r_A^*$ . More accountability.
- Result 3: The higher the variance in electoral results (i.e. the lower  $z$ ), the higher the level of equilibrium rents  $r_A^*$ . The expected vote share becomes less sensitive to policy when there is more electoral uncertainty (so candidates will bias the policy in their favor when  $\delta$  has higher variance).

## Case 2: Multiple-District (FPTP) Elections

Again we will compare the results under a single-district PR system with a multiple-district FPTP system.

3 (one seat) electoral districts with plurality rule in each district, two party system.

Each district is identical and coincides with each group  $J$  (Persson and Tabellini (2000) also deal with the case of less than perfect overlap).

In order to control the legislative 2 districts are necessary.

Think about a parliamentary regime like the UK with two main parties running in each district.

## Case 2: Multiple-District (FPTP) Elections (cont.)

Under this electoral rule the existence of equilibrium is not guaranteed without further assumptions.

Indeed you could have cycles where candidate  $A$  courts any two districts at the expense of the remaining one. Given that strategy, the opponent could deviate and “buy off” either one of the two districts supporting  $A$  plus the district left out under  $A$ ’s platform.

You solve this cycling problem by making districts 1 and 3 far away enough from  $\sigma^2 = 0$ , so that it is not convenient for a candidate that is really ideologically disliked in those districts (candidate  $B$  in district 1 and candidate  $A$  in district 3) to pay for their support.

*Assumption 3:* The ideological biases at the extremes are large,  $\sigma^1 \ll 0 \ll \sigma^3$ .

Under Assumption 3 the equilibrium is such that  $A$  and  $B$  announce equal policies and all the competition takes place in district 2 only.

## Case 2: Multiple-District (FPTP) Elections

The probability that candidate  $A$  is elected is:

$$p^A = Pr[\pi^{2,A} \geq 1/2]$$

And using (9) and the uniformity assumption on  $\delta$ , we get:

$$\begin{aligned} p^A &= Pr[\{1/2 + w^2[U^2(q_A) - U^2(q_B) - \delta - \sigma^2]\} \geq 1/2] = \\ &= Pr[\{w^2[U^2(q_A) - U^2(q_B) - \sigma^2]\} \geq w^2\delta] \end{aligned}$$

using our distributional assumption,  $p_A$  further simplifies to:

$$p^A = 1/2 + z[U^2(q_A) - U^2(q_B)] \quad (13)$$

All hinges on what happens in district 2.

## Case 2: Equilibrium

As for Case 1, the solution of this problem entails realizing that the problems for candidate  $A$  and  $B$  are symmetric.

We can find the equilibrium policy by considering the policy maximizing the expected value of victory:

$$E(v^A) = p^A(\gamma r + R) \quad (7)$$

with respect to  $q^A$ , taking  $q^B$  as given, and subject to:

$$u^J = 1 - \tau + f^J + H(g) \quad (5)$$

$$g = 3\tau - r - \sum_J f^J \quad (6)$$

$$p^A = 1/2 + z[U^2(q_A) - U^2(q_B)] \quad (13)$$
$$\tau \leq 1$$

## Case 2: Equilibrium Conditions

You can follow exactly the same steps as for Case 1.

- Equalize the net marginal gain from 1 extra dollar of public good (increases the probability of winning) to the net marginal gain from transferring 1 extra dollar to group 2 (also increases the probability of winning).
- Equalize the net marginal gain from one extra unit of rents (decreases probability of winning but increases utility from being in office) to the net marginal gain from transferring money to group 2 (increases the probability of winning).

$$\partial E(v^A)/\partial g_A = \partial E(v^A)/\partial f_A^2 \rightarrow w^2 H'(g_A) = w^2 \quad (14)$$

$$\partial E(v^A)/\partial g_A = \partial E(v^A)/\partial f_A^2 \rightarrow \gamma p_A = z(\gamma r_A + R) \quad (15)$$

## Case 2: Equilibrium Conditions (cont.)

Equalizing the net marginal gain from one extra unit of public good to the net marginal gain from transferring money to group 2 gives you the equilibrium amount of public good provided  $g_A^{**}$ . Simplify equation (14) to see it:

$$H'(g_A) = 1 > w^2/3w > 1/3$$

*Result: The first inequality implies that the public good is underprovided relative to the proportional representation (Case 1) level determined by  $H'(g) = w^2/3w$ .*

The last inequality implies that the public good is underprovided relative to the socially optimal level determined by  $H'(g) = 1/3$ .



## Case 2: Equilibrium Conditions (cont.)

Equalizing the net marginal gain from one extra unit of rents to the net marginal gain from transferring money to group 2 (equation 15) gives:

$$\gamma(1/2 + z[1 - (f_A^2 + g_A + r_A)/3 + f_A^2 + H(g_A) - U^2(q_B)]) = z(\gamma r_A + R)$$

Which, together with the government budget constraint (6) and  $g_A^{**}$ , delivers both  $f_A^{2**}$  and  $r_A^{**}$

*Even easier: You can plug in the equilibrium condition  $p_A = p_B = 1/2$  and check that rents can be positive in equilibrium:*

$$\gamma/2 = z(\gamma r_A + R)$$

With  $r_A \geq 0$

Notice that *higher rents make candidates lose votes at a higher rate in FPTP elections.*

## Case 2: Equilibrium Conditions (cont.)

Compare the Case 2 (multi-district FPTP) condition for optimal rents:

$$\gamma/2 = z(\gamma r_A + R)$$

with the Case 1 (single-district PR) condition:

$$\gamma/2 = z/3w \times (w^2) * (\gamma r_A + R)$$

- *Higher rents make candidates lose votes at a higher rate in FPTP elections.*
- *The equilibrium level of rents are lower with multiple-district FPTP than with single-district PR.*

Electoral competition is stiffer because it concentrates on the most responsive voters.

# Discussion of Electoral Competition

Plurality elections concentrate electoral competition in key marginal districts and induce more targeted redistribution (you can show that transfers to district 2 are higher –hint: use the budget constraint) and lower provision of public goods than proportional representation single-district systems.

Since voters in marginal districts also can be more responsive to economic benefits, then electoral competition is stronger in majoritarian systems and rents are lower.

# More Empirical Evidence on Electoral Rules

- Persson, Tabellini, and Trebbi (2003): Lower political rents/corruption in FPTP regimes.
- Kunikova and Rose-Ackerman (2005) show that closed list PR are particularly detrimental in terms of corruption (this seems also related to career concerns of politicians, a topic we have not addressed explicitly).
- Milesi-Ferretti, Perotti and Rostagno (2002): More redistributive programs and higher government spending/GDP in PR systems in a panel of OECD countries.
- Baqir (1999) however finds no relation between size of US municipal government and single-district (at-large) vs. multiple-district (ward) electoral rules.

Persson and Tabellini (2000) ch.10

We now shift gear and focus on *types of political regimes*.

We will focus in particular on *the behavior of the legislature* under different regimes.

We will first set up a benchmark “Simple Legislature” model.

Then we will twist the agenda-setting components of the model in order to decouple “ways and means” (i.e. taxes) vs. “appropriations” (i.e. spending) in the budgetary process.

Analogies in presidential-congressional & parliamentary regimes.

# Simple Legislature

Consider a political system with  $N = 3$  identically sized groups of voters, indexed by  $J$ .

Each group  $J$  coincides with a district. Each district is represented by an incumbent legislator  $l = 1, 2, 3$ .

Voters in group  $J$  get utility from consumption  $c^J$  and a general public good  $g$

$$u^J = c^J + H(g)$$

where  $H$  has standard properties ( $H' > 0$ ,  $H'' < 0$ ). Let us assume that voters consume all disposable income so:

$$u^J = y - \tau + f^J + H(g)$$

Where  $y$  is income,  $\tau$  indicates taxes, and  $f^J$  denotes a non-negative lump sum transfer to members of group  $J$ .

# Legislators and Rents

Once again, legislators (i.e. the government) can employ tax revenues to produce the public good, but can also appropriate part of the revenues as private rents  $r = \sum_l r^l$ .

Note:  $r^l$  indicates the rents appropriated by legislator  $l$ .

The production of public good  $g$  entails a cost of transforming private goods into public goods equal to 1 ( $\theta = 1$ , no uncertainty about it).

Then, the government budget constraint is:

$$g = 3\tau - r - f$$

Where  $f = \sum_J f^J$ .

# The Politician: Public goods and Rents (cont.)

As in Topic 1, each incumbent politician enjoys (exogenous) rents from being in office  $R$ . The politician can obtain  $R$  only if elected, which happens with reelection probability  $p^I$ .

Preferences of politicians are then given by:

$$\gamma r^I = p^I R \quad (16)$$

Where  $\gamma < 1$  reflects the fact that politicians face some transaction cost in extracting private rents.



# Timing of the game

## Sequential Structure:

- 1 Nature selects at random among the legislators an agenda setter  $a$ .
- 2 Voters set their reelection voting strategies setting  $p^l$  contingent on their utility level.
- 3 The agenda setter  $a$  proposes a policy vector  $q_A = [\{f^J\}, g, \{r^l\}, \tau]$  conditional on ex ante electoral strategy  $p^l$ .
- 4 The three legislators vote on the proposed policy vector  $q$ . If a majority supports the proposal,  $q$  is implemented; otherwise a default policy  $q^0 = [\{f^J = 0\}, g = 0, \{r^0 > 0\}, \tau = r^0]$  is implemented.
- 5 Politicians face an identical challenger. Elections are held.

# Voters' Strategies

As usual we restrict our attention to equilibria in which voters in each group  $J$  coordinate on the same retrospective voting strategy:

$$\begin{aligned} p^J &= 1 \text{ iff } U(q) > k^J \\ &= 0 \text{ otherwise} \end{aligned} \tag{17}$$

where  $k^J$  indicates the voter's reservation utility and  $J = I$ .

Voters play Nash against all other districts.

Legislators have an interest in increasing the welfare of their district if they wish to be reelected.

Note: This voting rule is ex post optimal only under our assumption about politicians facing identical challenger. The timing would matter in a probabilistic voting model.

# Equilibrium Conditions

Let us indicate the equilibrium policy vector of this simple legislature ( $L$ ) game as  $q^L$

An equilibrium of this game has to satisfy the following three conditions:

- 1 For any vector of reservation utilities  $\{k^l\}$ , at least one legislator  $l \neq a$  must weakly prefer policy  $q^L$  to policy  $q^0$ .
- 2 For any vector of reservation utilities  $\{k^l\}$ , legislator  $l = a$  must strictly prefer policy  $q^L$  to any policy obtaining a majority in the legislature.
- 3 The reservation utilities  $\{k^l\}$  are optimal taking as given the reservation utilities in other districts and taking into account the policy implemented.

## Solution: Transfers to $l \neq a$

The districts that are not the agenda setter cannot obtain positive transfers.

The intuition is that a minimum winning coalition of two districts is necessary: The agenda setter plus another legislator (no matter from where).

The agenda setter will join forces with the district/legislator that is the cheapest to buy (Bertrand competition again).

This will push down the requests the two legislators/districts  $l \neq a$  will be able to see satisfied.

In particular, excluding collusive behavior by assumption, Bertrand competition will push transfers outside  $a$  to zero.

$$f^{L,l} = 0 \text{ for } l \neq a$$

## Solution: Rents to $l \neq a$

In case of failure of the proposal  $q^L$  to pass, legislators who are not the agenda setter can garner reservation utility  $\gamma r^0$ .

Consider for instance the legislator in coalition with the agenda setter. His choice is between supporting the proposal and get  $\gamma r + R$  or voting against the proposal and get  $\gamma r^0$ .

So the minimal amount of rents that the agenda setter is going to allow her allies is

$$\gamma r^{L,m} + R = \gamma r^0 \quad \text{or} \quad r^{L,m} = r^0 - R/\gamma$$

Which we assume negative (the default option is not as good as staying in office without rents). Hence, no rents accrue to  $l \neq a$ . (This is without impact on our results other than that you do not have to compensate allies to vote for the proposal.)

$a$  has a decision to make:

- Steal everything: setting  $g^* = f^* = 0$  and total rents  $r^* = 3y$ . However,  $a$  has to convince another legislator to support this “Leviathan” proposal. Since both politicians will not be reelected, the minimum level of rents to allocate to the ally has to be  $r^0$ . Rents for  $a$  in this case are  $3y - r^0$
- Earn reelection: if  $a$  is aiming at reelection,  $a$  gets then  $\gamma r^{L,a} + R$

So the incentive compatibility constraint for  $a$  is:

$$\gamma r^{L,a} + R \geq \gamma(3y - r^0) \quad \text{or} \quad r^{L,a} \geq 3y - R/\gamma - r^0$$

Voters in district  $a$  will keep the politician under check by making the inequality bind.

# a Voters' Problem

Notice that rents to legislators  $l \neq a$ . and transfers to districts  $J \neq a$ . are allocated by politician  $a$ , which is in turn held accountable by voters in  $J = a$ .

Ultimately the voters will be able to set a reelection strategy such that the policy proposed by the agenda setter satisfies:

$$\text{Max}\{y - \tau^L + f^{L,a} + H(g^L)\}$$

Subject to

$$\begin{aligned} g^L &= 3\tau^L - r^{L,a} - f^{L,a} \\ r^{L,a} &\geq 3y - R/\gamma - r^0 \end{aligned}$$

where we've already replaced the results that there are no rents to legislators  $l \neq a$  and no transfers to districts  $J \neq a$ .

## a Voters' Solution

Voters have all the incentive to tax all other groups to the maximum, provide some public good, and redistribute to themselves, so  $\tau^L = y$

Voters in district  $a$  will keep the politician under check by making the inequality on rents bind:

$$r^{L,a} = 3y - R/\gamma - r^0$$

Transfers can be obtained from the government budget constraint:

$$f^{L,a} = R/\gamma + r^0 - g^L$$

Voters will set the provision of the public good to the point where their private marginal utility  $H'(g^L)$  is equal to their private marginal cost (1):

$$H'(g^L) = 1$$



## a Voters' Solution (cont.)

**Remark 1:** Voters will set the provision of the public good to the point where their private marginal utility  $H'(g^L)$  is equal to their private marginal cost (1):

$$H'(g^L) = 1$$

The benefit to the other two districts is not internalized & the public good is underprovided.

Notice, however, that  $f^{L,a} = R/\gamma + r^0 - g^L \geq 0$ . So we cannot have a too-large a  $g^L$ . Assume this holds.

**Remark 2:** The reservation utility of the voters in  $l \neq a$  is met at  $H(g^L)$ . That is, the public good savages some utility from the less powerful districts, by linking their welfare to the welfare of the most powerful group a.

# Summary of the Equilibrium

The unique subgame – perfect equilibrium of this game satisfies:

$$\begin{aligned}r^L &= r^{L,a} = 3y - R/\gamma - r^0 \\ r^{L,l} &= \max[0, r^0 - R/\gamma] = 0 \text{ for } l \neq a \\ \tau^L &= y\end{aligned}$$

$$H'(g^L) = 1$$

$$\begin{aligned}f^{L,a} &= R/\gamma + r^0 - g^L \\ f^{L,l} &= 0 \text{ for } l \neq a\end{aligned}$$

# Summary of the Equilibrium (cont.)

The unique subgame – perfect equilibrium of this game satisfies:

$$\begin{aligned}k^{L,a} &= H(g^L) + f^{L,a} \\ k^{L,l} &= H(g^L) \text{ for } l \neq a\end{aligned}$$

All politicians are re-elected.

# Discussion

Notice that since all the groups are playing Nash, districts with  $l \neq a$  really suffer from Bertrand competition as in the case of electoral rules and political accountability.

However, voters in the district represented by the agenda setter  $a$  will be still able to discipline their politician, since staying in office in such a valuable position is worthwhile.

Voters in the district represented by the agenda setter  $a$  will be also benefit from the position of power of their own representative in the form of positive transfers. They will expropriate resources from the two other districts.

Finally, in the “simple legislature” public goods are underprovided relative to the optimum . Differently from transfers,  $g$  benefits all districts and not just voters in district  $a$ . However, we have shown that in equilibrium group  $a$  will only consider its private benefit and cost (i.e. *Only 1/3 of the social benefits are internalized.*)

# Presidential-Congressional Regime

Presidential-Congressional regimes can be linked to our model of the simple legislature.

Consider how the proposal power on taxes and the allocation of spending may be split between to two different legislators or branches of government. **Think of it as the President presenting the budget and Congress proposing the ways and means to implement it.**

This model will present some of the interesting feature of our separation of powers discussion. Just now we will be also have a (more realistic) segmented polity of  $N = 3$  districts.

Of course, there are other features characterizing presidential systems. This model does not encompass all of them.

We are mostly going to capture the gist of the typical dispersion of proposal power typical of presidential regimes.

# Timing of the Game

Sequential structure:

- 1 Nature selects at random among the legislators an agenda setter for  $g$ ,  $a^g$ , (say, the president) and an agenda setter for  $\tau$ ,  $a^\tau$ , (say, the ways and means committee).
- 2 Voters set their reelection voting strategies setting  $p^l$  contingent on their utility level and depending on the status of their legislator.
- 3 The agenda setter  $a^\tau$  proposes a tax rate  $\tau$ .
- 4 The three legislators **vote** on  $\tau$ . If the proposal fails, then default tax rate  $\tau^0 > 0$ .
- 5 The agenda setter  $a^g$  proposes a budget  $q = [\{f^J\}, g, \{r^l\}]$  conditional on ex ante electoral strategy  $p^l$  and  $\tau$ .
- 6 The three legislators **vote on the proposed policy vector**  $q$ . If a majority supports the proposal,  $q$  is implemented, otherwise a default policy  $q^0 = [\{f^J = 0\}, g = 0, \{r^0 > 0\}]$  is implemented.
- 7 Politicians face an identical challenger. Elections are held.

## Solution: Transfers to $l \neq a$

Solve backward. At stage 5, the districts that are not the  $a^g$  agenda setter cannot obtain positive transfers.

- The intuition is that a minimum winning coalition of two districts is necessary: The agenda setter plus another legislator (no matter from which district).
- The agenda setter will join forces with the district/legislator that is the cheapest to buy.
- This will push down the requests the two legislators/districts  $l \neq a^g$  will be able to see satisfied.
- In particular, excluding collusive behavior by assumption, Bertrand competition will push transfers outside  $a^g$  to zero:

$$f^{C,l} = 0 \text{ for } l \neq a^g$$

# Solution: $a^g$ 's Rents

$a^g$  has a decision to make:

- **Steal everything:** setting  $g^* = f^* = 0$  and total rents  $r^* = 3\tau$ . However  $a^g$  has to convince another legislator to support the proposal. Since both politicians will not be reelected, the minimum level of rents to allocate to the ally has to be  $r^0$ . Rents for  $a^g$  in this case are  $3\tau - r^0$ .
- **Earn reelection:** if  $a^g$  is aiming at reelection,  $a^g$  gets then  $\gamma r^{C,ag} + R$

So the incentive compatibility constraint is:

$$\gamma r^{C,ag} + R \geq \gamma(3\tau - r^0) \text{ or } r^{C,ag} \geq 3\tau - R/\gamma - r^0$$

Voters in district  $a^g$  will keep the politician under check by making the inequality bind ( $r^{C,ag} = \max[0, 3\tau - R/\gamma - r^0]$ ).



## Solution: Transfers to $l \neq a^g$

In case of failure of the proposal  $q^C$  to pass, legislators who are not the agenda setter can garner reservation utility  $\gamma r^0$ . Consider for instance the legislator in coalition with the agenda setter.

His choice is between supporting the proposal and get  $\gamma r + R$  or voting against the proposal and get  $\gamma r^0$ . So the minimal amount of rents that the agenda setter is going to allow her allies is

$$\gamma r^{C,m} + R = \gamma r^0 \text{ or } \gamma r^{C,m} = r^0 - R/\gamma$$

Which we assume negative, so no rents accrue to  $l \neq a^g$ . (This is without impact on our results other than you do not have to compensate allies to vote for the proposal.)

Voters in  $ag$  will still set the provision of the public good to the point where their private marginal utility  $H'(g^C)$  is equal to their private marginal cost (1):

$$H'(g^C) = 1$$

Recall, any dollar spent on  $g$  does not get to them in the form of transfers.

Notice, however, that  $f^{C,ag} = R/\gamma + r^0 - g^C \geq 0$ . So, as before, we cannot have a too-large a  $g^C$ . Assume this condition holds.

# Taxation Stage (3)

Presidential regimes have this additional stage where the ways and means are determined and the overall size of the budget is set.

The voters supporting the tax policy agenda setter  $a^T$  know that at stage (5) no transfers accrue to any  $l \neq a^g$

At stage (5) indeed the legislator  $a^g$  will have no incentives to enforce any agreement between them (assume a one-shot game) and no rents will be shared either.

Interestingly, we can make again the point we made in the separation of powers' analysis: *Agenda setter  $a^T$  is not the residual claimant over tax revenues (the residual claimant is  $a^g$ ) and  $a^T$  has no incentive to raise taxes beyond the level necessary to strictly provide  $g^{*C}$ .*

This is good for voters because they have full alignment with legislator  $a^T$ .

## Taxation Stage (3) (cont.)

In the presidential-congressional regime tax rates can be minimal:

$$\tau^{*C} = g^{*C}/3$$

Which implies  $r^{*C,ag} = 0$  and  $f^{*C,ag} = 0$  is an equilibrium.

This equilibrium is supported by cutoff rules of the type:

$$k^{C,l} = y - g^{*C}/3 + H(g^{*C}) \text{ for all } l$$

Note: Voters in  $a^g$  are better off accepting no transfers than making an incompatible demand triggering a deviation by their politician with  $g = f = 0$  and maximal rents. This follows from  $y - y - g^{*C}/3 + H(g^{*C}) > g^{*C}/3 + H(g^{*C})$  which is what district  $a^g$  would get in case any incompatible demand was not met and taxes were already set at  $\tau^{*C} = g^{*C}/3$  (note all tax revenues would go to Leviathan legislators not to transfers).

# Equilibrium discussion

Persson and Tabellini (2000) show that this equilibrium is not unique. [We have just described the best equilibrium for voters in district  $a^T$ ].

There are also equilibria where rents are still zero, but voters in district  $a^T$  accept to be taxed above  $g^{*C}/3$  and  $a^g$  voters get positive transfers:

$$\tau^C \in [g^{*C}/3, (R/\gamma + r^0)/3] \text{ and } f^{*C,ag} \in [0, R/\gamma + r^0 - g^{*C}]$$

Note:  $r^{C,ag} = \max[0, 3\tau - R/\gamma - r^0]$  implies that taxes above  $(R/\gamma + r^0)/3$  automatically go into rents to  $a^g$ . Also, voters in  $a^T$  are better off accepting taxes above  $g^{*C}/3$  than making an incompatible demand triggering a deviation by their politician with  $g = f = 0$  and maximal rents.

Since cutoff rules are set simultaneously at stage (2), we cannot rule out these equilibria (there are many ways in which voters in  $a^g$  and  $a^T$  can agree on a zero-rents platform).

*However, the general result is that rents and taxes are lower under a presidential-congressional regime and public goods are still heavily underprovided.*

We now present a model which clearly identifies the incentives for coalition-building that are present within parliamentary regimes.

Consider how the proposal power on taxes and the allocation of spending may be split between two different legislators, but now allow the two proponents cooperate to a certain extent, weakening the separation of powers.

Think of  $a^\tau$  proposer of the tax rate  $\tau$  and the expenditure agenda setter  $a^g$  as *ministers of the same cabinet*.

# Timing of the Game

Sequential structure:

- 1 Nature selects at random among the legislators an agenda setter for  $g$ ,  $a^g$ , (say, the president) and an agenda setter for  $\tau$ ,  $a^\tau$ , (say, the ways and means committee).
- 2 Voters set their reelection voting strategies setting  $p^j$  contingent on their utility level and depending on the status of their legislator.
- 3 The agenda setter  $a^\tau$  proposes a tax rate  $\tau$ .
- 4 The agenda setter  $a^g$  proposes a budget  $q = [\{f^j\}, g, \{r^j\}]$  conditional on ex ante electoral strategy  $p^j$  and  $\tau$ .
- 5 The two agenda setters have veto power on the other's member proposal. If there is no veto,  $\tau$  and the proposed policy vector  $q$  are implemented. If the proposal fails (no confidence motion), a default policy  $q^0 = [\{f^j = 0\}, g = 0, \{r^j / 3 > 0\}, \tau^0 = g^0 + r^j]$  is implemented.
- 6 Politicians face an identical challenger. Elections are held.

# Default Policy Characteristics: Technical Assumption

Persson and Tabellini have to be a bit untidy here to simplify their life and set a default policy vector for the government crisis in the following way:

$$\{f^{J,0} = 0\}$$

$$g = g^0, \text{ such that } H'(g^0) = 1$$

$$\{r' / 3 > 0, \text{ with } r' = 3y - (R/\gamma + r^0)$$

$$\tau^0 = g^{0+r'}$$

These values match the expected payoffs of a “*caretaker government*” subgame (Example: Government crisis triggers a technocrat government to rule ad interim. Italy 1994).

The idea is to make “breaking the coalition” and losing their power very costly for the two agenda setters.

The caretaker subgame is the following: (1) One legislator is picked at random to be the caretaker; (2) Voters reformulate electoral strategies; (3) The caretaker makes the entire budget proposal; (4) Congress votes for the proposal.



# Parliamentary Regime: Intuition

Politicians will be jointly deciding the budget, so the two agenda setters will clearly collude more.

Now both legislators are residual claimants on tax revenues by setting their own rents.

Voters will see their strength reduced vis-à-vis politicians relative to the presidential- congressional regime.

However, mutual veto power gives bargaining power to all members of the coalition, so more of the social benefits from public goods will be internalized.

# Parliamentary Regime: Rents

$a^T$  and  $a^G$  has a decision to make:

- **Steal everything:** setting  $g^* = f^* = 0$  and total rents  $r^* = 3y$ . Since both politicians will not be reelected, total utility in this case is  $\gamma 3\gamma$
- **Earn reelection:** if  $a^T$  and  $a^G$  are aiming at reelection, each  $a$  gets then  $\gamma r^{P,a} + R$

So the incentive compatibility constraint is:

$$\gamma r^P + 2R \geq \gamma 3\gamma \text{ or } r^P \geq 3y - 2R/\gamma$$

Voters will keep the two politicians under check by making the inequality on total rents bind. Of course rents to the remaining legislator will be zero.

You can show that  $r^L \geq r^P \geq r^C$

# Parliamentary Regime: Taxes

$a^T$  and  $a^g$  are both residual claimants on tax revenues and since high taxes maximize the amount of resources available for rents they like to raise taxes.

On top of that, voters in their districts will also be happy to fully expropriate voters outside the governing coalition and get part of the resources back in the form of transfers and public good provision.

In equilibrium the agenda setter  $a^T$  proposes a tax rate  $\tau^P = y$  and  $a^g$  accepts.

This implies that  $\tau^L = \tau^P \geq \tau^C = y$

Redistribution will favor the majority.

However, the fact that now two legislators enter the cabinet and have both veto power implies that the provision of the public good will be higher, as the optimal decision will entail comparing the marginal cost of increasing the public good provision and to the sum of the marginal benefits of both  $a^T$  and  $a^G$  voters.

- More of the social benefit is internalized.

To solve this problem one has to maximize the utility of voters in district  $a^T$  given the utility of voters in district  $a^G$  (or vice versa).

# Solution Sketch (cont.)

It is possible to show that if  $\{f^{J,P} > 0\}$ ,  $J = a^\tau, a^g$ ,  $g$  is such that  $2H'(g) = 1$

But since once again there's simultaneity in the process of setting reservation utilities by the voters welfare can be split among the two groups of voters in many different ways, other equilibria exist with

$\{f^{J,P} > 0\}$ ,  $J = a^\tau, a^g$ ,  $g$  is such that  $1/2 \leq H'(g) < 1$ .

This equilibrium is supported by cutoff rules of the type:

$$k^{P,J} = f^{*,P,J} + H(g^{*,P}) \text{ for } J = a^\tau$$

$$k^{P,J} = f^{*,P,J} + H(g^{*,P}) \text{ for } J = a^g$$

$$k^{P,J} = H(g^{*,P}) \text{ for } J \neq a^\tau, a^g$$

# Institutional Trade-off: Low Rents vs. Public Goods

## Under-provision

Presidential-Congressional regimes rely on the stronger separation of power between branches of government to curb on legislator's abuse. Presidential regimes exploit the conflict of interest among legislators to the voter's benefit.

Parliamentary regimes allow for collusion among different members of the governing coalition, which brings rent-seeking and taxation to higher levels relative to presidential regimes.

However, parliamentary regimes allow for more provision of public goods, by encompassing coalitions including representatives from a larger spectrum of the electorate and hence internalizing more of the benefits of the public goods (the ruling majority being larger).

# Further Discussion on Form of Government

Controlling for income per capital and a set of other standard cross-country covariates, Presidential-Congressional regimes tend to have a 10% lower public spending to GDP relative to Parliamentary regimes (Persson and Tabellini, 1999).

No clear statistical evidence on corruption.

If you combine parliamentary regimes and PR systems you also see more broadly oriented public spending programs relative to targeted programs (form of government alone is not significant).

# Conclusion on Comparative Politics

- Wide cross-country and within country variation in political institutions.
- Analysis of democracies vs. autocracies.
- Within democracies: Many Constitutional features of relevance.
- Electoral rules and Form of Government in particular are interesting, among the other things, for their impact on fiscal policy.