

# Lecture 6: Public choice theory

Miroslav Palanský

Charles University, Prague



March 24, 2020, Public Finance

# Course schedule

Week	Date	Topic	Chapters	Lecturer
1	Feb 18	Economic rationale for the government	1, 2, 3, 4, 5	Miroslav Palanský
2	Feb 25	Public budgets	10, 26, 27	Natalia Li
3	Mar 3	Inequality		Marek Šedivý
4	Mar 10	Old-age pensions		Ondřej Schneider
5	Mar 17	Health economics	12	Ondřej Schneider
6	Mar 24	Public choice theory	7, 8	Miroslav Palanský
7	Mar 31	Cost-benefit analysis	6, 10, 11	Petr Janský
8	Apr 7	Taxation, tax incidence	17, 18	Miroslav Palanský
9	Apr 14	Tax evasion	23, 24	Petr Janský
10	Apr 21	Corporate taxation	21, 25	Petr Janský
11	Apr 28	Optimal taxation, personal income taxation	19, 20, 22	Miroslav Palanský
12	May 5	Externalities	9	Miroslav Palanský
13	May 12	Public procurement		Miroslav Palanský

## Course requirements

Requirement	Maximum points	Announced	Deadline
Problem Set 1	10	Mar 24	Mar 31, 23:59
Problem Set 2	10	Apr 14	Apr 21, 23:59
Wiki Edits	20	Feb 18, 14:00	Apr 28, 23:59
Final Exam	60	Exam 1 on May 19, 14:00 Exams 2, 3 in June Exam 4 in September	
Total	100		

# Today's lecture

Introduction

Preference revelation

Preference aggregation

Decision rule

Translating votes into mandates

Power exercise

## Collective decisions

- ▶ Why not just direct democracy?
- ▶ Small number of voters can decide using direct democracy
- ▶ Large number of voters → transaction costs too large → representatives must be chosen

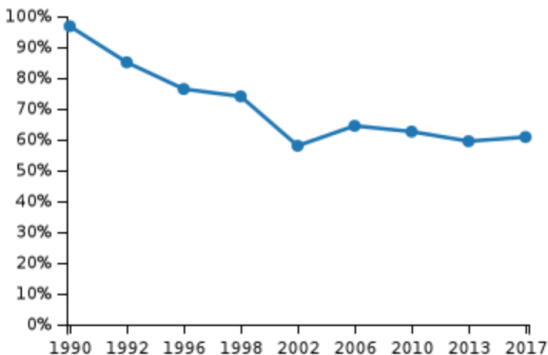
# Collective decisions: problems

1. Preference revelation
2. Preference aggregation
  - 2a Decision rule
  - 2b Translating votes into mandates
3. Power exercise

## Problem 1: Preference revelation

- ▶ Private good: buying vs. not buying
- ▶ Public good & representative dem.: voting for candidate X
- ▶ It is hard to extract people's preferences
  - ▶ Many opinions & small number of candidates → voting for the 'lesser evil'
  - ▶ Who votes? (age limits, discrimination)
  - ▶ Information asymmetries
  - ▶ Influencing other voters: lobbying, interest groups, advertisement, money
  - ▶ Transaction costs (voter turnout)

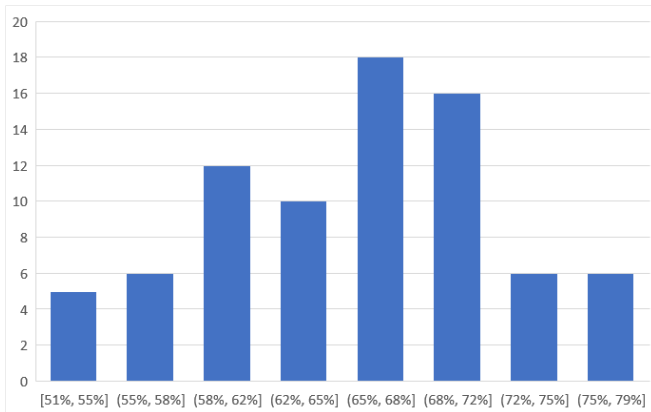
# Turnout in Czech elections to the Chamber of Deputies



Source: Wiki



# Turnout in Slovak elections (2020), histogram by county



Source: Data from statistics.sk

## Voter turnout

- ▶ What influences the decision to vote?
- ▶ Two types of factors:
  1. individual level (age, opportunity cost, social status, ...)
  2. external/aggregate level (weather, campaign spending, close polls, ...)

## Problem 2: Preference aggregation

- ▶ Three main sources of differences in views: tastes, income, taxes
- ▶ Government spending vs. tax system
- ▶ The tax price = the additional amount an individual must pay when gov't expenditures increase by one dollar.
- ▶ How to aggregate these differences?

2a Decision rule

2b Translating votes into mandates

## Problem 2a: Decision rule

- ▶ What key/rule to use to decide on an issue?
- ▶ Note that decision rule can be different for different decisions
  - ▶ e.g., stronger rule for important issues

# Voting systems I

## 1. Unanimity voting

- ▶ All agents have to agree (i.e. full veto right for everyone)
- ▶ Problems: may be very rigid; 0/1 nature

## 2. Simple majority voting

- ▶ At least 50% of all agents have to agree
- ▶ Problems: needs an odd number of agents; might not lead to an equilibrium; 0/1 nature

## 3. Two-thirds majority voting

- ▶ At least 67% of all agents have to agree
- ▶ Problems: needs  $3x$ ,  $x \in \mathbb{Z}$  of agents to be correctly set up; might not lead to an equilibrium; 0/1 nature

## Voting systems II

### 4. Sequence of votes

- ▶ Voting in rounds, common in elections
- ▶ Problems: very sensitive to setup; strategic voting; 0/1 in steps nature

### 5. Ranking and ordering

- ▶ Rank (or order) all alternatives, highest sum of ranks wins
- ▶ Problems: might not lead to an equilibrium; all alternatives have the same weight; own preferences might not be well observed by voters; complexity

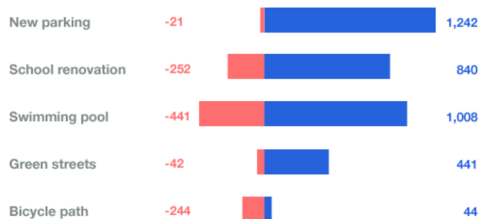
### 6. Democracy 2.1 (d21.me)

- ▶ Three votes for, one against
- ▶ Problems: complexity; strategic voting

etc. ...

## Democracy 2.1

- ▶ Example: voting for projects that spend public money
- ▶ Suppose that all projects cost the same and there is money for two projects
- ▶ With simple majority voting, a swimming pool would be built, even though it is widely opposed



Source: <http://d21.me/en/>

## In search of an ideal political mechanism

- ▶ 4 characteristics of an ideal political mechanism:
  1. Transitivity
    - ▶ If  $A \succ B$  and  $B \succ C$ , then  $A \succ C$
  2. Nondictatorial choice
    - ▶ The system has to be democratic, not autocratic
  3. Independence of irrelevant alternatives
    - ▶ If we are to choose between A and B, the outcome should not depend on whether there is some C
  4. Unrestricted domain
    - ▶ The mechanism has to work in all settings



## Arrow's impossibility theorem

- ▶ Kenneth Arrow: There is no system that satisfies all the desired characteristics
- ▶ However, relaxing the fourth condition helps a lot
- ▶ In case there are single-peaked preferences (one issue at a time), the majority voting equilibrium exists
  - ▶ Sometimes multi-peaked preferences are observed (Example: the rich and public vs. private schools, health care)
  - ▶ Sometimes we may get a cyclical pattern (Example: income tax schedule)

## The median voter

- ▶ Majority stepwise voting leads to the outcome preferred by the median voter
- ▶ Suppose 5 people want to decide on the level of public spending on education

Lucy	Tom	Jim	John	Jill
\$0	\$840	\$1 000	\$1 200	\$16 000

- ▶ If we let everyone vote between pairs of proposals, the median voter's (Jim's) proposal wins

## Problem 2b: Translating votes into mandates

- ▶ Many voters, but few candidates
- ▶ Largely a mathematical issue, but can have important consequences
- ▶ Decisions to make:
  - ▶ What is the level of constituency?
  - ▶ How many candidates to each constituency?
  - ▶ In presence of parties, how to sort candidates? (closed vs. open list)
  - ▶ Any thresholds to enter?
  - ▶ What to do with remainders?

# Dealing with remainders

1. Highest averages methods
  - ▶ D'Hondt (Jefferson) method
  - ▶ Sainte-Laguë method
  - ▶ Imperiali
  - ▶ Huntington-Hill method
2. Largest remainder (Hamilton) method
  - ▶ Hare quota
  - ▶ Droop quota (Hagenbach-Bischoff)

## D'Hondt method I

- ▶ Each party gets a certain number of votes
- ▶ Mandate assignment is then done in rounds and quotients are calculated in each round for each party as

$$Q = \frac{V}{m + 1}$$

where  $V$  is the number of received votes and  $m$  is the number of mandates assigned so far to the party (initially 0 for all parties)

## D'Hondt method II

- ▶ Simple example: 4 mandates, 3 parties A, B and C (which obtained 100, 80 and 45 votes, respectively)

Round	Party A	Party B	Party C
1	<b>Q = 100/(0 + 1) = 100</b>	$Q = 80/(0 + 1) = 80$	$Q = 45/(0 + 1) = 45$
2	$Q = 100/(1 + 1) = 50$	<b>Q = 80/(0 + 1) = 80</b>	$Q = 45/(0 + 1) = 45$
3	<b>Q = 100/(1 + 1) = 50</b>	$Q = 80/(1 + 1) = 40$	$Q = 45/(0 + 1) = 45$
4	$Q = 100/(2 + 1) = 33.3$	$Q = 80/(1 + 1) = 40$	<b>Q = 45/(0 + 1) = 45</b>
TOTAL	2	1	1

- ▶ D'Hondt method is a way to translate the election results (100 (44.4%), 80 (35.56%) and 45 (20%), respectively) to mandates (2 (50%), 1 (25%) and 1 (25%), respectively)

## Other highest-average methods

- ▶ Same mechanism, but using different quotients
- ▶ D'Hondt method:  $Q = \frac{V}{m+1}$
- ▶ Sainte-Laguë method:  $Q = \frac{V}{2m+1}$
- ▶ Imperiali: 1, 1.5, 2, 2.5, ...
- ▶ Huntington-Hill method:  $\sqrt{n(n+1)}$

## Largest remainder (Hamilton) method

- ▶ A quota (election number) is set and all votes are divided by this quota
- ▶ Integers are directly translated into mandates
- ▶ The remainders are ordered and the rest of the mandates assigned to highest remainders
- ▶ Hare:  $Q = \frac{votes}{seats}$ ; Droop:  $Q = \frac{votes}{seats+1}$



## Hamilton method with Hare quota

Party	Yellows	Whites	Reds	Greens	Blues	Pinks	Total
Votes	47,000	16,000	15,800	12,000	6,100	3,100	100,000
Seats							10
Hare Quota							10,000
Votes/Quota	4.70	1.60	1.58	1.20	0.61	0.31	
Automatic seats	4	1	1	1	0	0	7
Remainder	0.70	0.60	0.58	0.20	0.61	0.31	
Highest Remainder Seats	1	1	0	0	1	0	3
Total Seats	5	2	1	1	1	0	10

## Voting in practice

- ▶ Complex voting systems have been developed
- ▶ Czech Chamber of Deputies:
  - ▶ Proportional representation system, by political party, by region
  - ▶ 5% threshold for entry of party
    - ▶ Coalitions: 2: 10%, 3: 15%, 4+: 20%
  - ▶ D'Hondt (Jefferson) method to distribute the mandates across constituencies and also across parties

## Problem 3: Power exercise

- ▶ Public sector is composed of private agents
- ▶ Individual welfare of the officials vs. social welfare
- ▶ (Political) corruption: abuse of (political) power for private gain
- ▶ Principal-agent problem (conflict of interests, rent-seeking, cronyism, political connections)
- ▶ Financing politics

## Financing politics

- ▶ Special interest groups may try to influence the decisions of politicians for their own profit
- ▶ Private vs. public financing of political parties
- ▶ Should we allow individual people to use their money to influence the thinking of others?
- ▶ More pressingly, should we allow companies to do so?
  - ▶ Their primary purpose is to make profit. Is financing politics an investment?
  - ▶ Are politicians going to return the favor using public funds?
  - ▶ Are all the ways in which politicians are able to return the favor legal and if so, are they ethical and desirable?

## Financing politics in practice

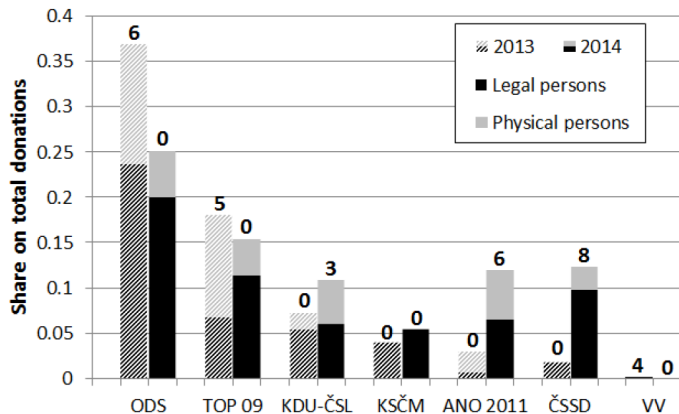
- ▶ Czechia: a mix—both public and private financing
- ▶ Information on donors is publicly available, but only in the physical form → PolitickeFinance.cz
- ▶ Public financing: Around CZK 500 million yearly + additional 500 million in election years
- ▶ Private financing: both natural and legal persons' donations are allowed, now capped at CZK 3 million per year/party/person

# Conflicts of interests in Czechia

## skuhrovec2015:

- ▶ 30% of Czech public procurement suppliers donate money to political parties
- ▶ 20% of corporate donors receive EU funding
- ▶ Around 5% of corporate donors are shell companies, some are economically inactive
- ▶ 8% are offshore companies

## Donations as investment?



Source: palansky2020

Note: The numbers above bars represent the number of party's members of government.

# Thank you!

Miroslav Palanský

[miroslav.palansky@fsv.cuni.cz](mailto:miroslav.palansky@fsv.cuni.cz)

[miroslavpalansky.cz](http://miroslavpalansky.cz)



# References I