Local Government and Public Goods

RE420: URBAN AND REGIONAL ECONOMICS

Introduction

- In the U.S., many public goods and services are provided by local jurisdictions
  - Elementary and secondary education, police and fire protection, public transit, city streets, sewers and sanitation, etc.
- The questions we are going to tackle today is:
  - How the amount of public goods provided by local governments is determined?
  - Are they provided at the socially optimal level?
  - Which action people can take if they want different levels of public goods and services?

An Example: Social Optimum

- Suppose there are three individuals (A, B, and C) in a city (City 1), and we know the individual preferences for the level of policing
- Assume that a policeman's salary is $24,000
- What is the socially optimal level of the police force in City 1?

Number of policemen (z)	Marginal benefit for consumer A	Marginal benefit for consumer B	Marginal benefit for consumer C	Marginal social benefit
1	$19,000	$16,000	$13,000	$48,000
2	$17,000	$14,000	$11,000	$42,000
3	$15,000	$12,000	$9,000	$36,000
4	$13,000	$10,000	$7,000	$30,000
5	$11,000	$9,000	$6,000	$26,000
6	$9,000	$6,000	$3,000	$18,000
7	$7,000	$4,000	$1,000	$12,000

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$\Rightarrow z^* = 5$

An Example: Individual Optimum

- Suppose that individuals pay equal amount for a policeman's salary
- For each individual, the marginal cost of hiring a new policeman is \$8,000 (=\$24,000/3)
- What is the individually optimal level of the police force in City 1?

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$z_A^* = 6$

$z_B^* = 5$

$z_C^* = 3$

An Example: Majority Voting Results

- Democratic societies choose the public good level through a voting process
- Since the median voter is consumer B, the local government will hire 5 policemen in the city
- In this example, the police officers are hired at the socially optimal level (z^*)

A New Example: Social Optimum

- How about now?
- Assume that a policeman's salary is still $24,000
- What is the socially optimal level of the police force in that city?

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1	$19,000	$16,000	$13,000	$48,000
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4	$13,000	$10,000	$7,000	$30,000
5	$11,000	$9,000	$6,000	$26,000
6	$9,000	$8,500	$3,000	$20,500
7	$7,000	$4,000	$1,000	$12,000

$\Rightarrow z^{**} = 5$

A New Example: Individual Optimum

- How about now?
- For each individual, the marginal cost of hiring a new policeman is still \$8,000 (=\$24,000/3)
- What is the individually optimal level of the police force in that city?

Number of policemen (z)	Marginal benefit for consumer A	Marginal benefit for consumer B	Marginal benefit for consumer C	Marginal social benefit
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$z_A^{**} = 6$

$z_B^{**} = 6$

$z_C^{**} = 3$

A New Example: Majority Voting Results

- While the socially optimal level is still 5, the voting result changes to 6
- In this example, the police officers are hired more than the socially optimal level ($z^{**} = 5$)

Voting with One's Feet

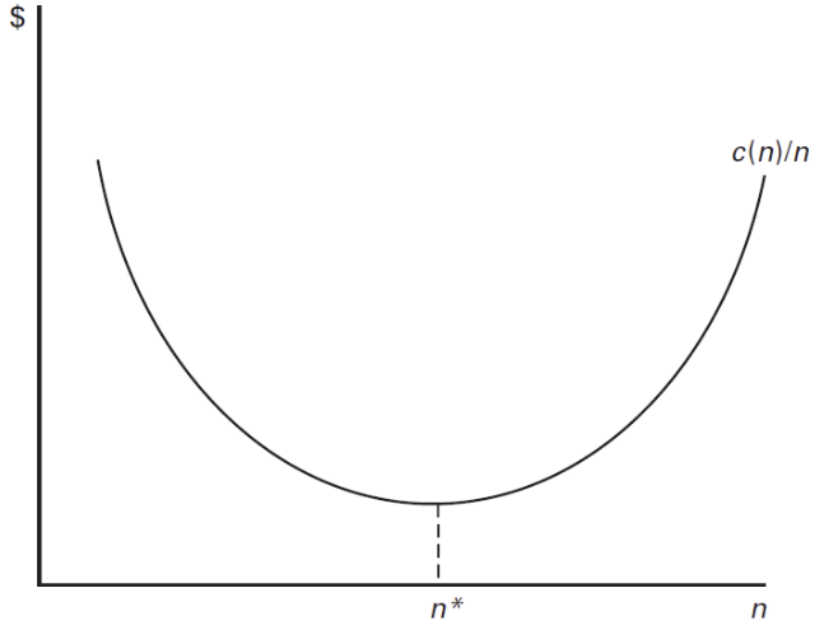
- Under the new voting outcome, consumer C gets more public good than he wants
- Assume there is another city, City 2, where all residents have the same preference as consumer C for the level of policing
- By the majority voting outcome, the number of police officers hired in City 2 will be 3
- If consumers are fully mobile, consumer C in City 1 will move to City 2 where her preference is best satisfied
- Eventually, there is incentives for consumers to separate into homogeneous jurisdictions (Schelling's Tipping Theory of Segregation)

Public-Good Congestion and Jurisdiction Sizes

Public Good Congestion and City Population Size

- In the previous example, we assume that the cost of hiring a new officer is always the same, $24,000
- This assumption is unrealistic since spending usually increases as the jurisdiction's population grows, i.e., congestion
- Let n denote the city population size, and $c(n)$ the cost of hiring a new policy officer when the city population is n
  - $c(n)$ is an increasing function of n
- An optimal jurisdiction size n^* would minimize the per capita cost of the public good $\frac{c(n)}{n}$

Public Good Congestion and City Population Size

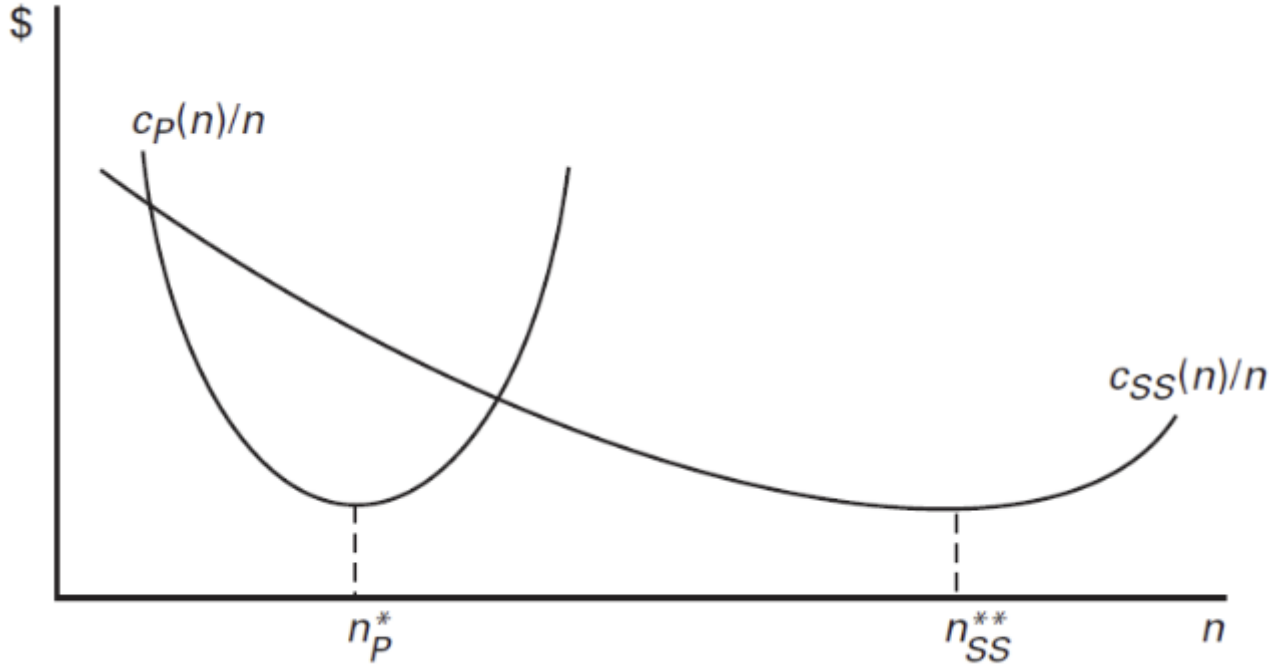


Optimal population of jurisdiction

City Population Size with Multiple Public Goods

- There are many types of local governments: cities, counties, school districts, etc.
- Existence of different levels of local governments can be explained by the concept of optimal city population size
- Consider the case where the local government offers two public goods: police protection and sewage
- The optimal city population size for police protection (n_P^*) can be different than the optimal city population size for sewage (n_{SS}^*)
- Therefore, the police protection is provided by the county and sewage services are provided by a large "sanitation district"

City Population Size with Multiple Public Goods



Optimal population of jurisdiction with Multiple Public Goods

Video Clip

Americans are relocating to places where political views match their own (2:45)

Key Takeaways

- Understand how the level of public spending determined by majority voting can differ from socially optimal levels of public goods
- Understand the concept of optimal jurisdiction size and needs for multiple types of jurisdictions
- (Optional) Readings
    - Jan K. Brueckner, *Lectures on Urban Economics.* Chapter 8.