Urban and real estate economics

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Urban and real estate economics

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Urban and real estate economics

Week 4

City size

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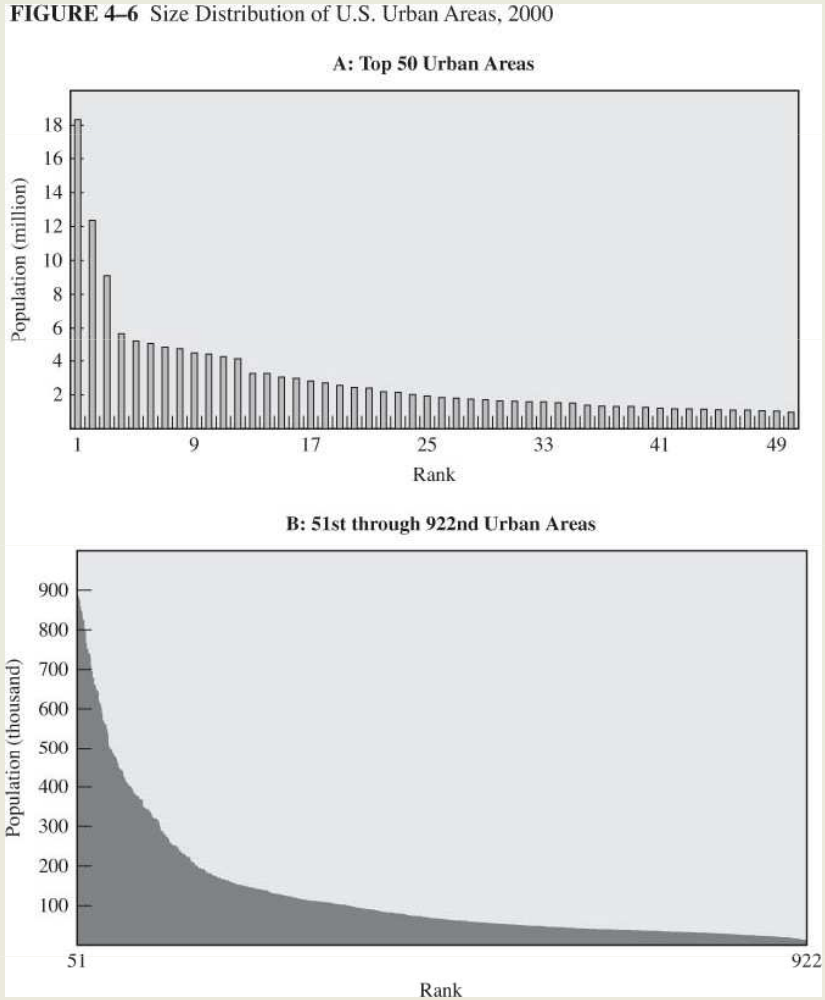
1. Distribution of city size
2. Growth of cities

1. Distribution of city size

Observation

The cities have different extent.

Why? Is the only reason the coincidence?



Zip observation (rank-size rule)

- The distribution of cities by size is exponential according to observations
- Place = $\frac{k_1}{population^{k_2}}$
- If k_2 = 1, the rank-size rule, that means that the rank times population is constant, is effective.
- The estimated constants can be higher than 1 because the population of the catchment area doesn't alwas match with the official number of the population because they live in the ambient towns.

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Zip observation in Hungary

Analyse the Zip observation for Hungary!

- Search for data from T-STAR database!
- Rank the cities by population!
- Estimate the nonlinear specification!

$$\frac{k_1}{population^{k_2}}$$

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The explanation of Zip observation

- The explanations are interesting and varied.
- According to Krugman [1996] the resources (rivers) are similarly distributed.

2. Growth of cities

How does the number of population influence the residents' welfare?

- In bigger cities the workforce is more productive, thus wages are higher.
- But the larger the city, the more expensive to get to work (it takes more time),
- As cities grow, the utility of workers first increases to a decreasing extent, then it starts to decrease. In extremely large cities the improvement in the marginal productivity is very small but the annoyances get bigger and bigger.

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How does the number of population influence the residents' welfare?

Cities may be too large but not too small.

The utility curve reaches its maximum with 2 million workers in a city. So a region with 6 million workers will maximize its welfare with 3 cities, each with 2 million workers.

The outcome with 6 small cities (1 million workers), is unstable, because the utility curve is positively sloped.

The outcome with 2 big cities is stable.

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Problem description

- The production function:

$$Y = X^{3/2}$$

where X number of people produces Y number of shirts in the city.

- The utility function:

$$U = W - d \cdot X$$

W is the coefficient of wage and d shows the discomfort feeling (co-habitation is bad because there are externalities, the housing is more expensive)

How many people move to town?

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Changes in the city size

- If there are more small towns under the utility maximum, the residents move away because they are better off with the move.
- If there are more big cities over the utility maximum, it is no use moving away because they will come off worse.

Task: City size

residental	1	2	3	4	6	8	9	10	11	12
utility	32	56	70	65	55	45	40	35	30	25

In the region the population is 12 million. See utility values in the table above. At first people live in one city.

- The government have one million people moved to a new city. What process will take place?
- The government have three times one million people moved to three new towns. What process will take place in this case?
- How many people should the government have moved to three new towns to evolve the optimal distribution in the region?

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Urban giants

Observations: urban giants grow up mainly in less developed countries.

Explanations:

- Site-specific advantages and size-efficient features of trading activities (London in the 16th century, Buenos Aires in the 19th century).
- One way for a dictator to stay in power is to take resources from the countryside and transfer them to the people in the capital city (Roma).
- In many developing countries the infrastructure is centralized so the costs of transportation and traffic are cheaper around the city.

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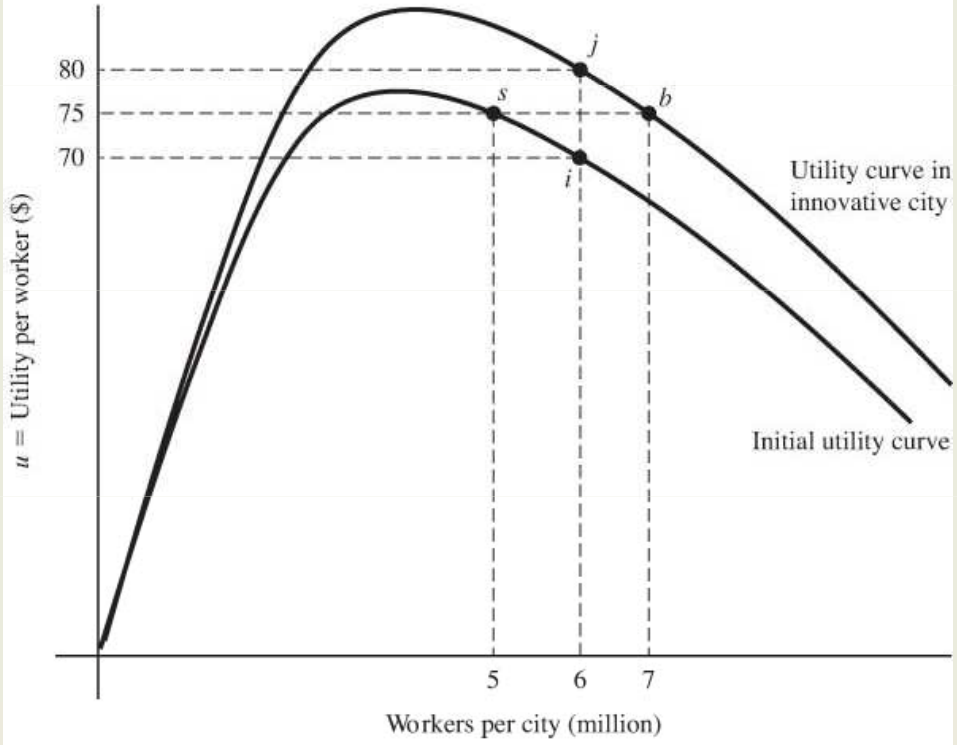
One of the cities starts to develop

FIGURE 5–1 Urban Economic Growth from Technological Progress



In the initial equilibrium shown by point *i*, a region's workforce is divided equally between two cities of 6 million workers. Innovation in one city shifts its utility curve upward, and in the absence of migration, the innovative city moves to point *j*. Migration to the innovative city generates points *b* (innovative city) and *s* (other city). The innovation increases utility in both cities and shifts population to the innovative city.

(*Figure: O'Sullivan*)

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The growth of cities

- Products to satisfy the local needs strenghten the size differences.
  For instance in a city amusement park and opera will also be built so more goods produced for local needs arise.

employment growth =
employment growth in export sector ·
employment multiplier

Task: The economic effect of sport

A city considers taking over the franchise of an NBA team. According to the proposal the move will increase the economy of the city by 61,6M$ because

- The average spectator spends 40$ for tickets, souvenirs, parking and in the snack bar.
- 700,000 people will see the games in a year.
- The multiplier is 2,2.

Do you think this calculation is correct?

According to a representative the takeover might even have negative effects on the city's economy. What arguments could he mention?

Buenos Aires and Chicago

- Campante –Gleaser: Yet Another Tale of Two Cities: Buenos Aires and Chicago
- In the 19th century the two cities grew for similar reasons: grain and meat were carried from the fertile areas to the east coast.
- In the 20th century Chicago grew much faster.
- What can the explanation be?

Buenos Aires and Chicago

In 1914 there were four remarkable differences between the two cities:

- Chicago was richer.
- In Chicago the number of educated population was higher.
- Chicago was more industrialized, the worker per capital ratio was 2,25 times higher in Chicago
- Chicago had a more stable political environment.

Buenos Aires and Chicago

Table 3:

19th Century Variables and 20th Century Economic Performance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable: Log GDP per capita 2000									
Log GDP per capita 1900	1.011***				0.238			0.242	0.339*
	[0.097]				[0.22]			[0.250]	[0.17]
Schooling (All levels) 1900		14.44***			7.540***	7.400***	14.35***	7.595***	2.698
		[1.70]			[2.15]	[1.35]	[1.75]	[2.259]	[1.82]
Manufacturing share of output circa 1913			0.0300***			0.0098*			
			[0.0089]			[0.0054]			
Average Polity2 score 1870-1900				0.0732***			0.0008	0.0028	
				[0.017]			[0.015]	[0.015]	
Average Polity2 score 1970-2000									0.0840***
									[0.020]
Observations	37	36	16	47	25	13	33	23	24
R-squared	0.653	0.701	0.439	0.154	0.659	0.833	0.687	0.654	0.856

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

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Curriculum

- Arthur O'Sullivan [2009]: *Urban Economics*. Chapter 4-5.

Further readings

- Paul Krugman [1996]: *The Self-Organizing Economy*.
- Filipe Campante–Edward Gleaser: Yet Another Tale of Two Cities: Buenos Aires and Chicago. *NBER WP* No. 15104. June 2009.