

Metropolitan-ization Forces,  
Patterns and Trends, Concerns

Day 2  
11.953  
9 February 2006

---

---

---

---

---

---

---

---

Content

- Metropolitan Growth Forces
  - Centripetal and Centrifugal
- Effects of Metropolitan Growth
- Patterns of Metropolitan Growth
- What should we do?

---

---

---

---

---

---

---

---

Why cities?

*"All of the benefits of cities come ultimately  
from reduced transport costs for goods,  
people and ideas"*

-Glaeser, 1998 p. 140

---

---

---

---

---

---

---

---

### What is a city?

- Statistically?
- Physically?
- Locationally?
- Functionally?

---

---

---

---

---

---

---

### Centripetal Forces: Agglomeration

#### Persons

- Higher earnings
- Labor shock “insurance”
- Bargaining power
- More/cheaper goods
- More social interaction opportunities
- Educational opportunities

---

---

---

---

---

---

---

### Centripetal Forces: Agglomeration

#### Firms

- Higher marginal productivity of labor
  - Perhaps due to specialization, knowledge spillovers, others?
- Increasing Returns & Lower Costs
  - Historically, but changing/changed?
- Access to labor
- Information spillovers

---

---

---

---

---

---

---

## Empirical Results: Firm Location in Los Angeles (CA)

Firm Type	Principal Locational Pull
Engineering and Architectural	Access to financial and other business firms
Computer & Data Processing, Rental & Leasing Equipment	Access to manufacturing firms
Legal Firms	Access to managerial labor
Accounting, Auditing, Mgmt. Consulting, PR	Access to managerial labor
Advertising	Access to managerial labor

Astrakianaki, 1995.

➤ “access to managerial labor is of primary importance for the majority of the examined firms (both business service and manufacturing).”

---

---

---

---

---

---

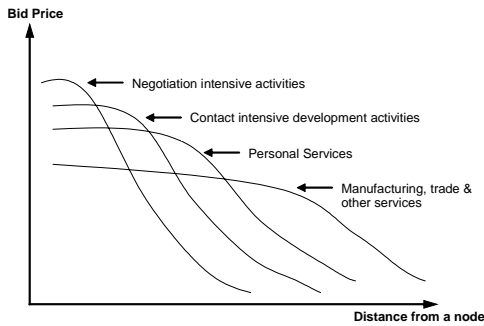
---

---

---

---

## Land Rent by Activity Type



Johansson, 1998

---

---

---

---

---

---

---

---

---

---

## Centrifugal Forces

- Housing Costs
- Transportation (congestion) costs
- Pollution costs
- Crime/Anonymity
- Higher levels of poverty
  - Perceived (real?) opportunities, public services, public transport, social networks

---

---

---

---

---

---

---

---

---

---

## Transport Share of Air Pollution

City	Year	CO	HC	NOx	SOx	SPM
Beijing	2000	84	NA	73	NA	NA
Budapest	1987	81	75	57	12	NA
Cochin	1993	70	95	77	NA	NA
Delhi	1987	90	85	59	13	37
Lagos	1988	91	20	62	27	69
Mexico City	1996	99	33	77	21	26*
Santiago	1997	92	46†	71	15	86‡
São Paulo	1990	94	89	92	64	39

\*PM10; † Does not include evaporative emissions ‡ PM10, including road dust.  
Source: WBCSD, 2001.

---

---

---

---

---

---

---

---

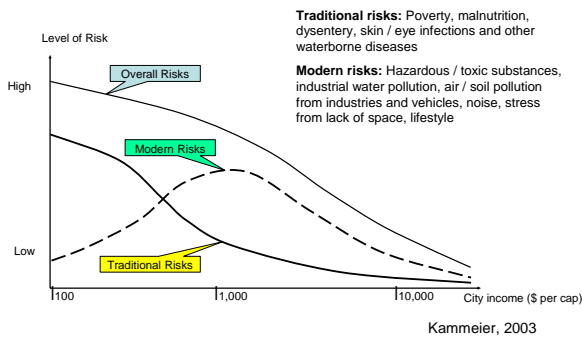
---

---

---

---

## Evolving Metropolitan Environmental Risks




---

---

---

---

---

---

---

---

---

---

---

---

## The “Transition Model” of Urban Environmental Problems

Transition from poor to affluent:

- Poor cities: Mainly local, health-threatening problems (drainage, water supply, sanitation)
- Middle-income cities: More regional problems (e.g., ozone)
- Affluent cities: *Relatively* healthy living, but large environmental pollutant “exporters”

Kammeier, 2003.

---

---

---

---

---

---

---

---

---

---

---

---

## Pollution: Not just centrifugal force...

- Transportation and local pollutants
  - 80-90% of all carbon monoxide; 40-75% of ozone precursors; 30-70% of respirable particulates
- Noise pollution/vibration & aesthetics
- Vehicle and parts disposal
- Land “pollution”
  - Groundwater run-off, hydrologic impacts of paving
- Depletion of natural resources and ecosystem changes
  - Loss of wetlands, infrastructure-induced land use changes, partition of habitats, etc.
- Transportation and global pollutants
  - 25% of current global greenhouse gases (GHGs)
  - The *most rapid* growing source of man-made GHGs

---

---

---

---

---

---

---

---

## De-Industrialization & Brownfields

---

---

---

---

---

---

---

---

## Centrifugal Force: Government?

- Ribbon cutting
- Failure to price accurately
- “Excessive” regulation?
  - Land uses, zoning, price controls, income redistribution
- Need for “institutional change”
  - Recurring theme in this course...

Glaeser, 1998.

---

---

---

---

---

---

---

---

## Centripetal versus Centrifugal

Which is "winning"?

---

---

---

---

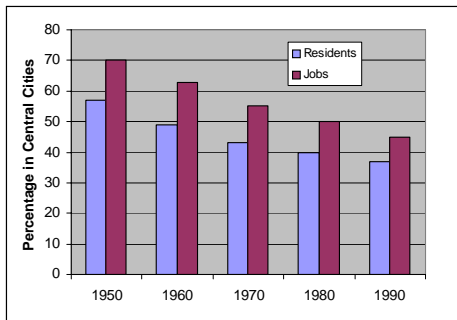
---

---

---

---

## US Decentralization of Persons and Jobs: MSAs 1950-1990



Mieszkowski and Mills, 1993.

---

---

---

---

---

---

---

---

Are the Patterns  
Generalizable, or Not?

---

---

---

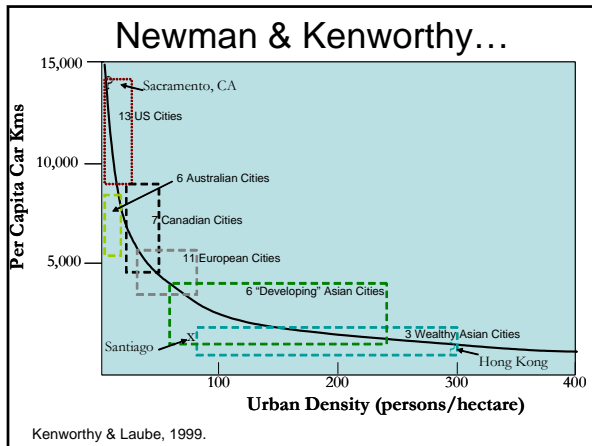
---

---

---

---

---




---

---

---

---

---

---

---

---

- ### Relevant Trends for Metropolis
- Service-orientation
    - Declining relative importance of manufacturing, particularly in cities
  - Linked to the so-called information society.
    - Increasingly important role of knowledge-intensive industries
    - Information has become the symbolic “production factor” of the times (Hall & Pfeiffer, 2000).
    - Importance of “tacit” knowledge (“uncodified and context specific;” Lam, 1998).
  - Implications for agglomeration???

---

---

---

---

---

---

---

---

- ### What other potential influences?
- Changing demographics
  - Changing tastes
  - Changing constraints
  - Others?

---

---

---

---

---

---

---

---

### Three Basic Forces of Relevance...

A. *Urbanization*  
(Urban population growth)

+

B. *Decentralization*  
(Urban outgrowth, "sprawl")

+

C. *Income Growth*

=

**More people making more trips over greater distances**

---

---

---

---

---

---

---

---

### Global Reality

- By 2030, developing cities urban population will double
  - 2 billion new residents
- = ~6 trillion additional private vehicle kms per year by 2030
- = ~600 billion additional liters of gasoline per year (53% greater than today)
- = ~1.9 billion annual tonnes of greenhouse gases

---

---

---

---

---

---

---

---

### What do we want from our Metropolises' LUT system?

#### Measures to be Increased

- Accessibility
- Equity of accessibility
- Appropriate mobility infrastructure

#### Measures to be Reduced

- Congestion
- "Conventional" emissions
- Greenhouse gas emissions
- Noise
- Other environmental impacts
- Community disruption
- Accidents
- Non-renewable energy demand
- Transport-related solid waste

Modified from WBCSD, 2001

---

---

---

---

---

---

---

---



## Additional Comments

- Ingram:
  - Why do peripheral *net* residential densities in developing countries tend to be higher than industrial (while *gross* tend to be same)?
  - Why does he conclude that land management for transportation management won't work in developing countries?
  - Which comes first, job or housing decentralization?
  - Are households "fundamentally similar" (i.e., similar utility functions)?

---

---

---

---

---

---

---

---

## Additional Comments: M&M

1. *natural evolution* theory – distance of residential location from central work places
  - Derivative of central-place theory and von Thünen land rent.
  - Directly derived from Alonso (1964), Mills (1967), Muth (1969).
  - Commuter-distance/cost.
  - Related to *density gradients*:
    - *Apparently* have flattened for a broad range of countries over long time periods.
    - Evidence *in favor of natural evolution*.
    - Most rapid period of suburbanization is 1920-1950 (pre-fiscal/social problems, *per se*);
    - using measures of fiscal/social problems in empirical analysis, show taxes, education, crime not significant (only race) – again support for evolution.
  - *Problems with density gradient*
    - small errors translate into large absolute quantities (fiscal/social can be important at the margin);
    - furthermore, the idea of a gradient itself might not be right
  - The multi-centric city ("edge cities") mean that the density gradient approach is increasingly irrelevant.

---

---

---

---

---

---

---

---

## Additional Comments: M&M

2. *fiscal and social problems* of central cities
  - high taxes, low quality services (schools), racial tensions, crime, congestion, etc
  - Calls into question the functional form of the density gradient.
  - Cross-country comparisons support social/fiscal problems, but specific causes cannot be teased out.

---

---

---

---

---

---

---

---

## Additional Comments: M&M

### *Policy implications*

- Appropriate role of federal/state govts depends on which "model" you believe
  - Natural evolution: just accommodate demand [what about *externalities*?]
- Allocational role should be responsibility of nation/state
- Tiebout-suburbanization can weaken central city tax base
- They suggest undeveloped land in central city be allowed to redevelop as a *separate jurisdiction*

---

---

---

---

---

---

---

---