

# **Basic Model of Urban Land Use**

**The Monocentric city Framework (Alonso–Muth–Mills)**

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**Minoru Osawa**

Institute of Economic Research

中島賢太郎 + 手島健介 + 山崎潤一

# 歩いて学ぶ 都市経済学



経済学を片手にあの街を歩いてみれば!

日本各地の街の何気ない風景に潜む「なぜ」を取り上げ、  
その背後にあるメカニズムを解説し、  
古今東西のデータを使った最新の研究成果も紹介する



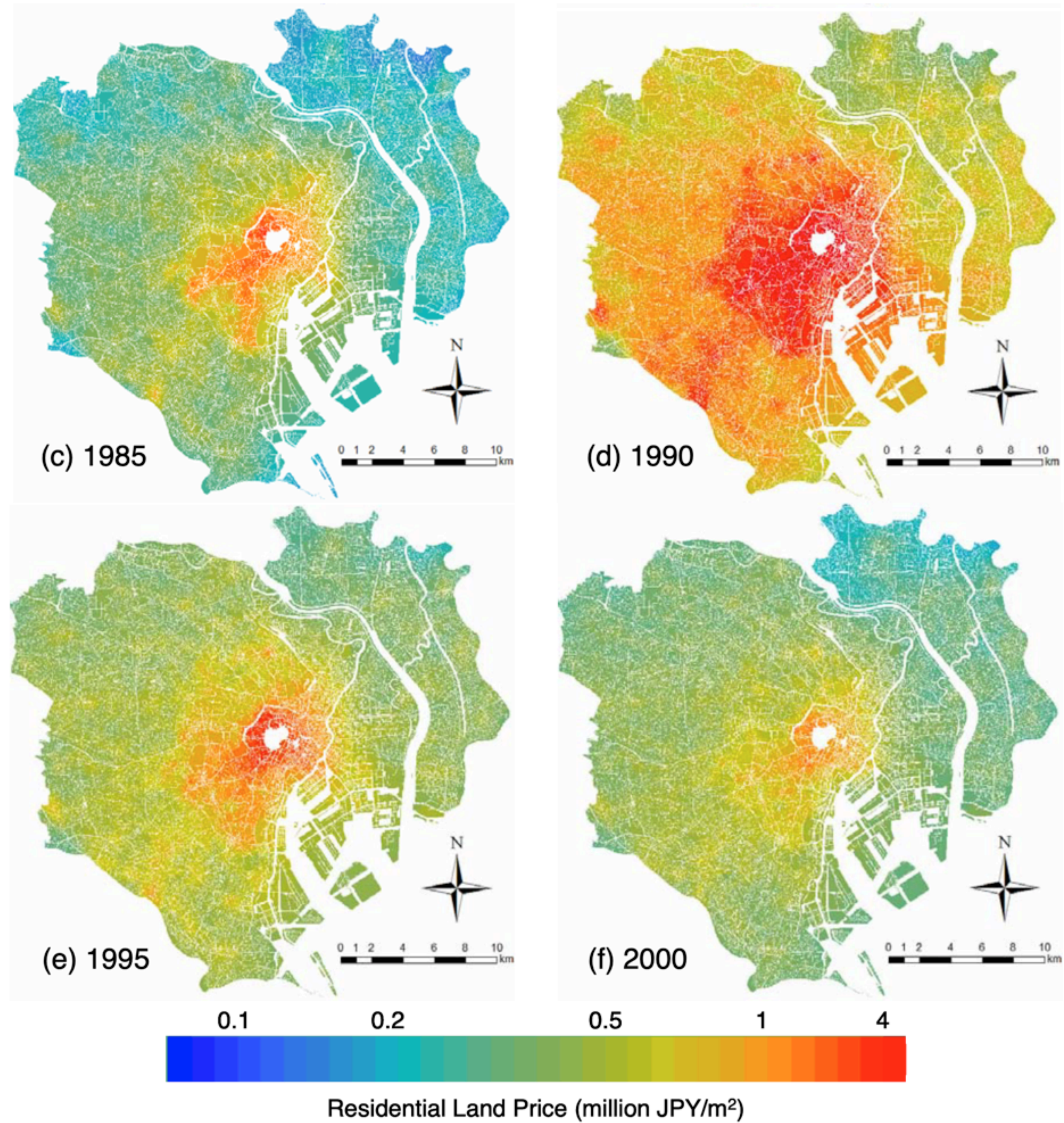
日本評論社



Tokyo

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Disk: total 2360 kB rate 315 kbps

Google Earth



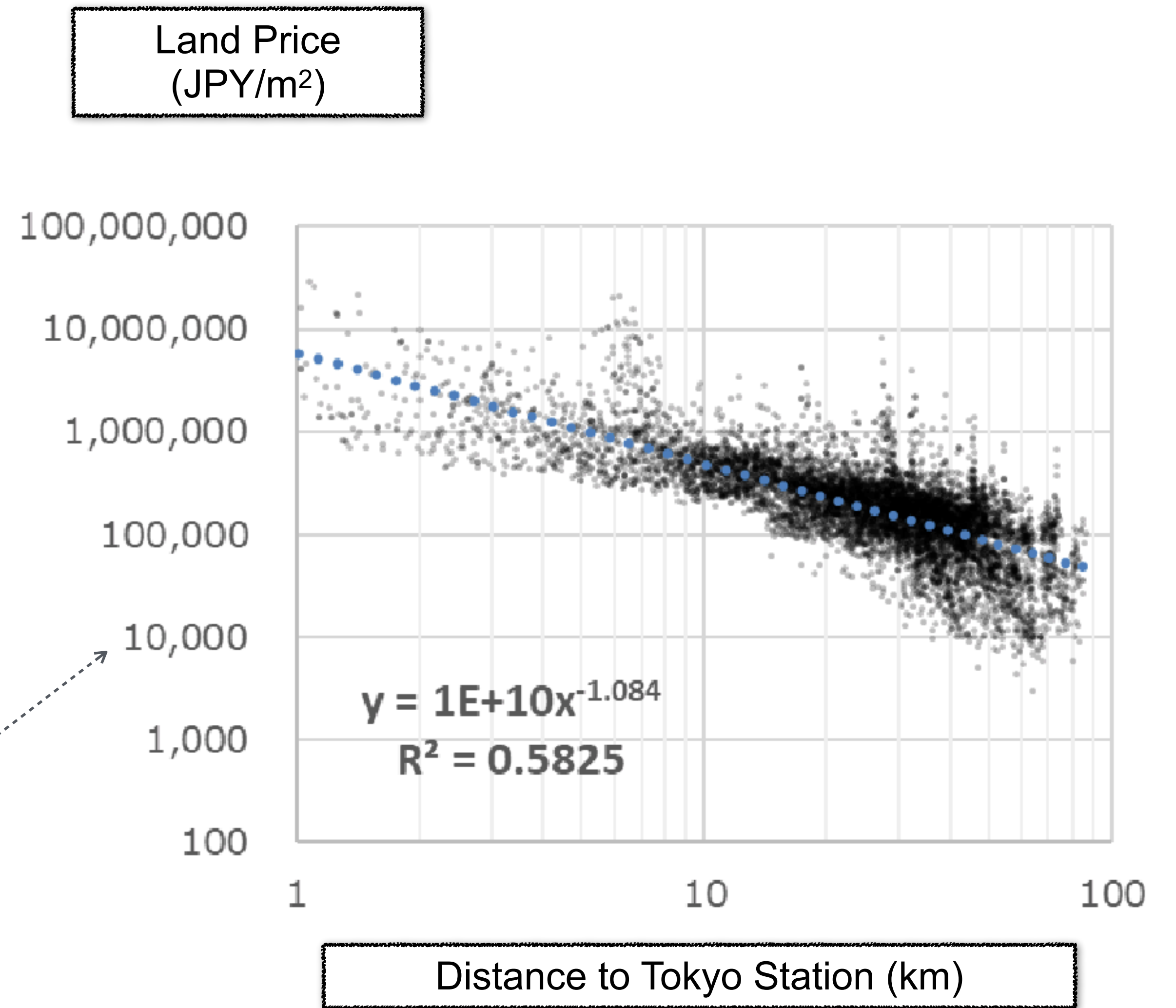
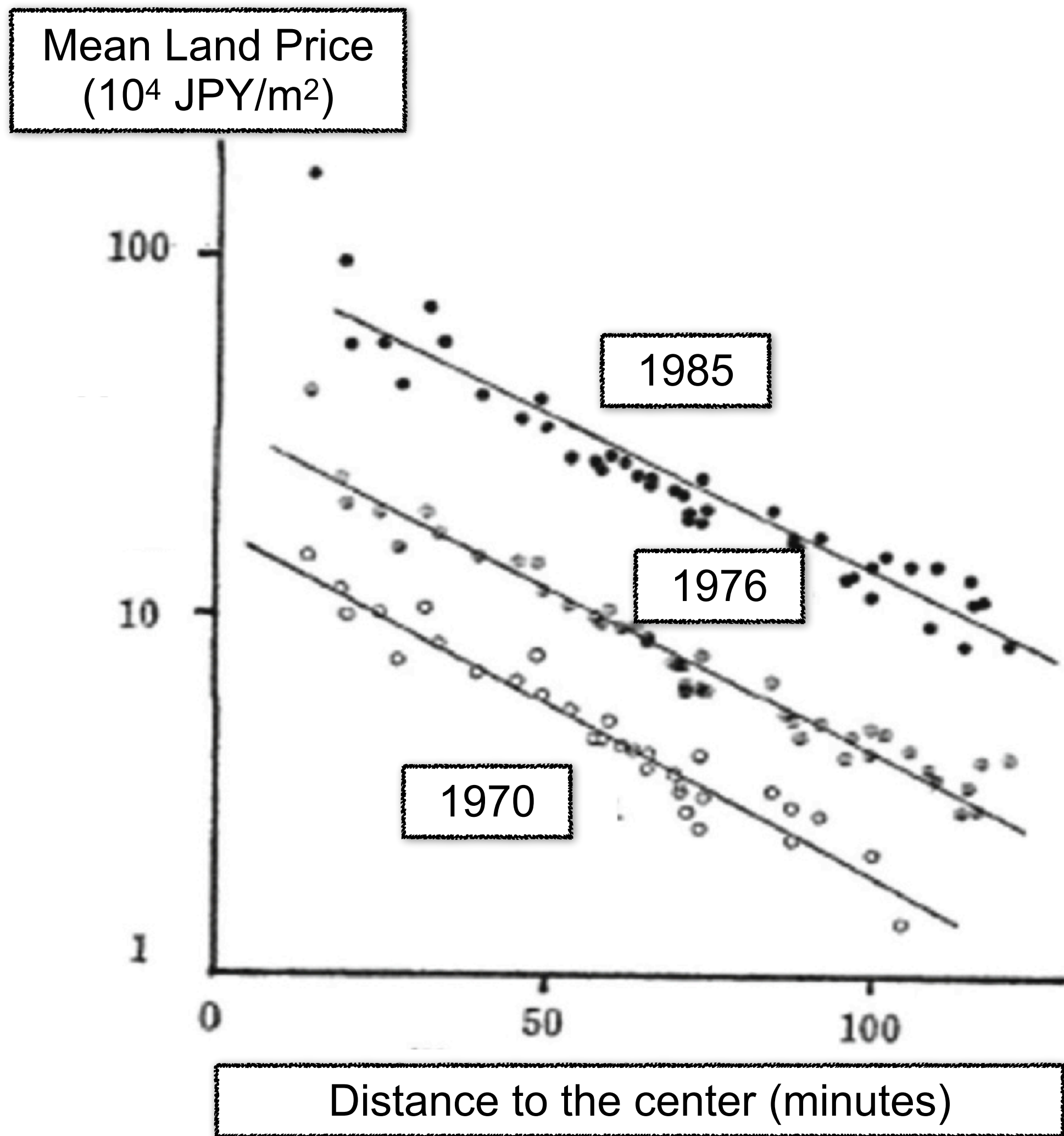
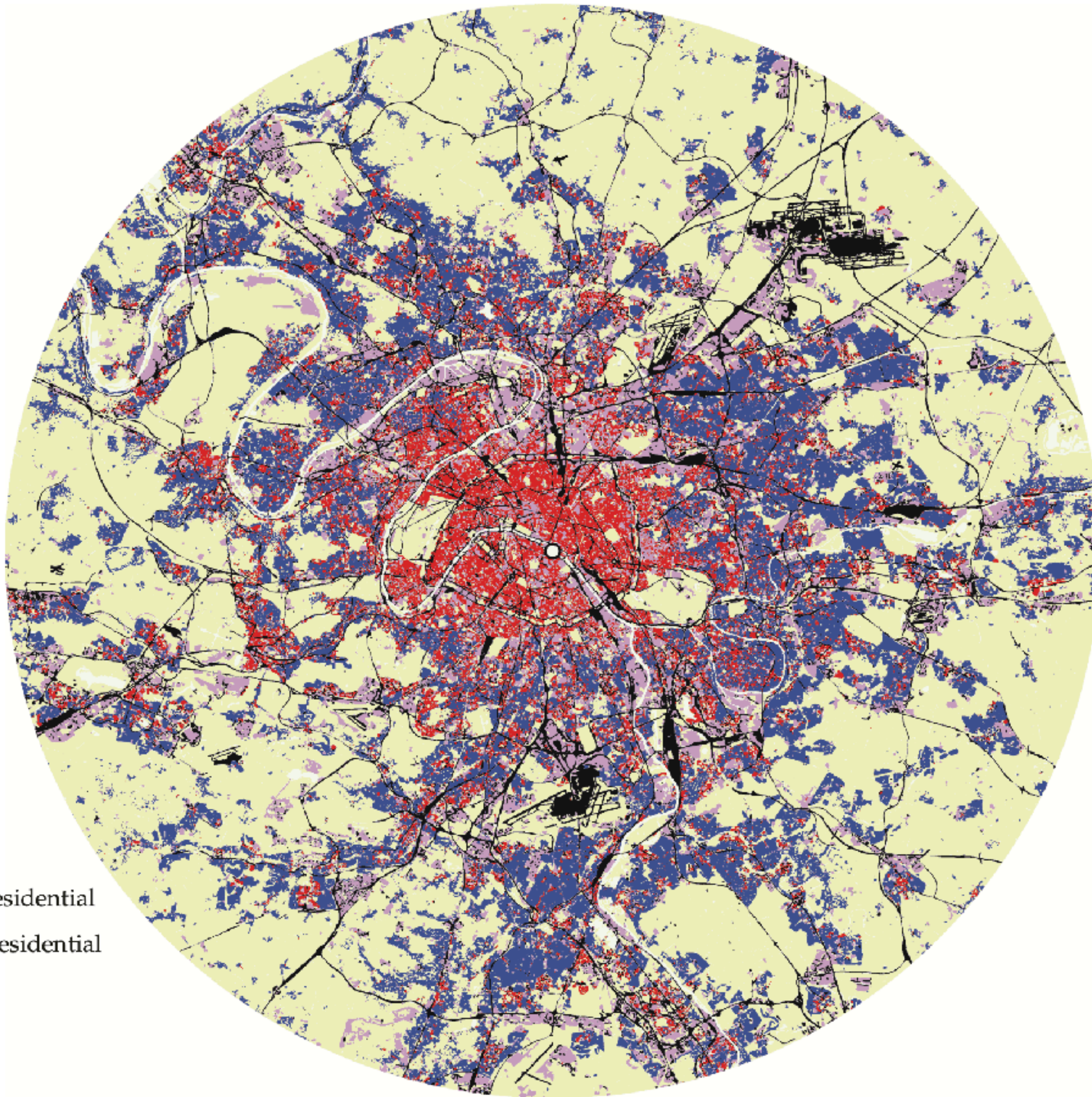
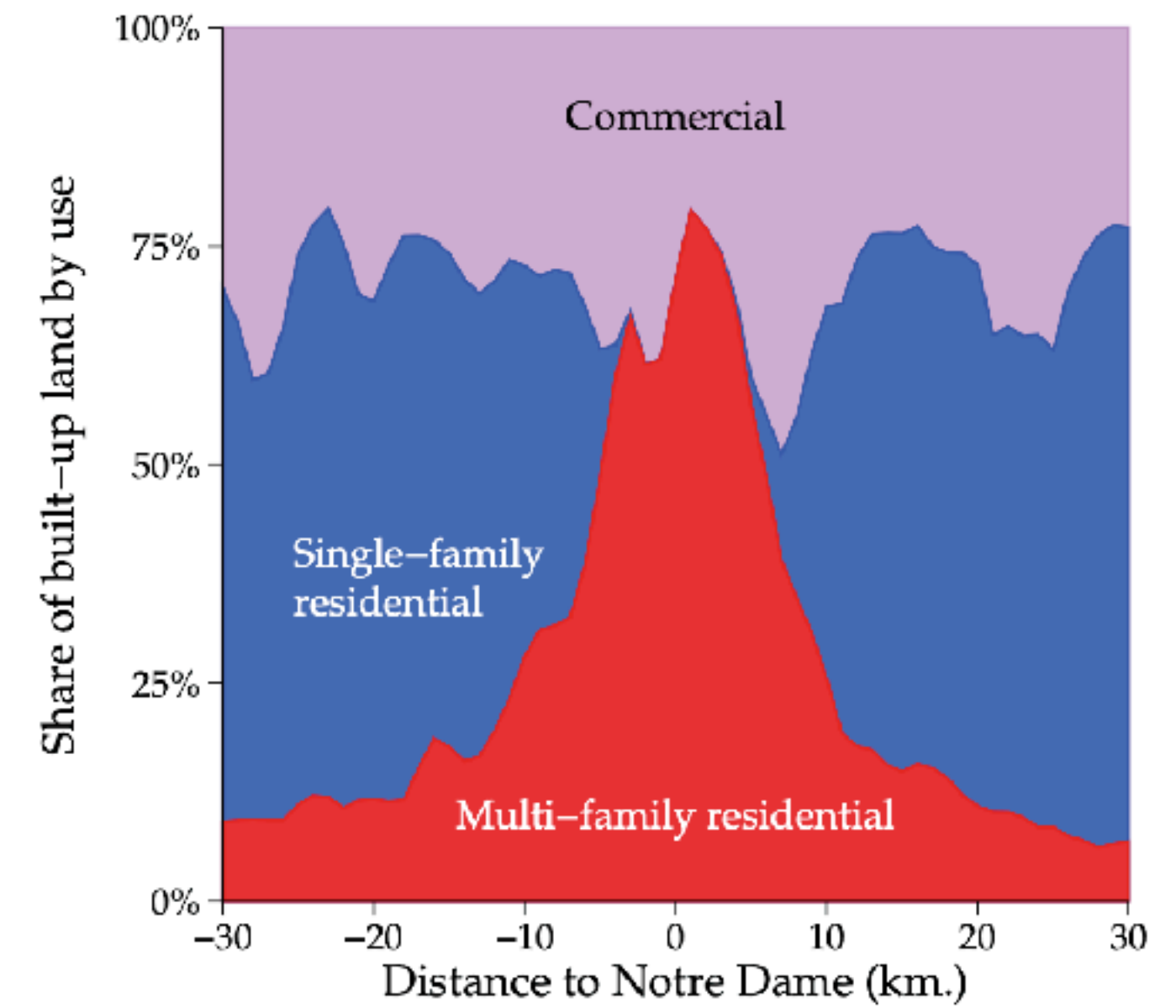
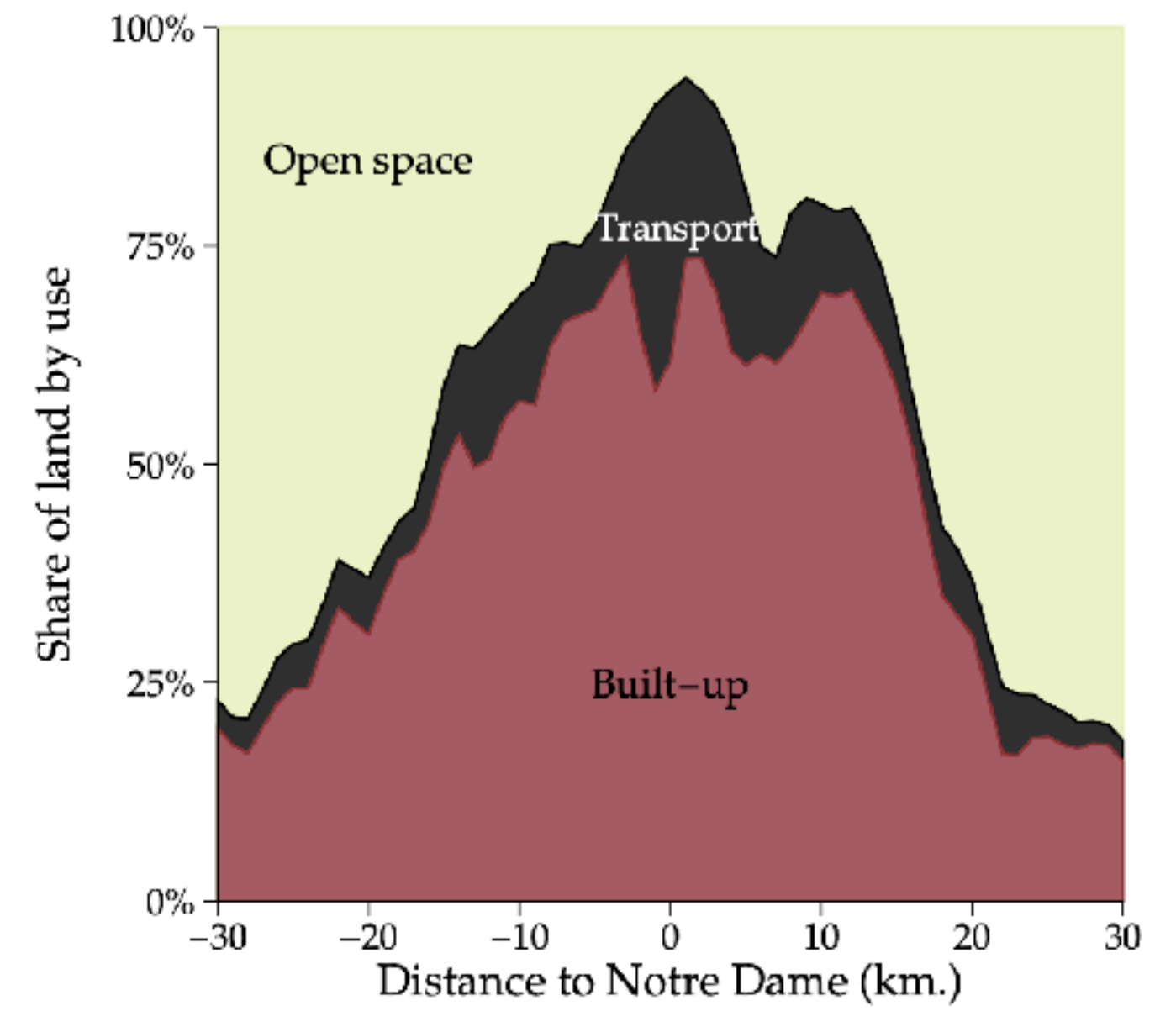


Figure left: 柏谷増男(1987), 大都市における地価形成—理論から現実へ—, 日本不動産学会誌, 2(3), p.15 図3

Figure right: 神田兵庫, 磯田弦 (2017), 大都市圏における人口密度と地価と通勤流動との相互関係—東京大都市圏の事例—, 第26回 地理情報システム学会.

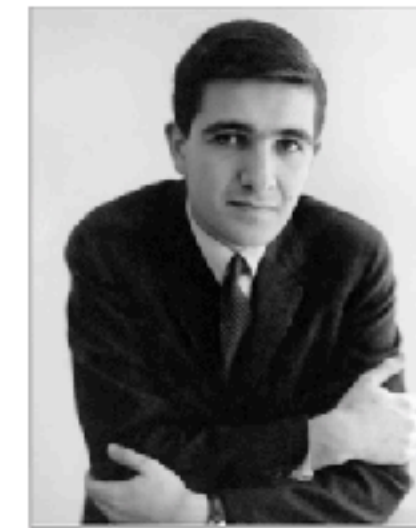


- Multi-family residential
- Single-family residential
- Commercial
- Transport
- Open space



# Urban Stylized Facts

- **Each city has typically a single city center**
  - **CBD**: Central business district
  - Bigger cities can have multiple centers
- **As we go away from the city center .....**
  - Land rent ↑
  - Housing size ↓
  - Population density ↓



William Alonso  
(1933–1999)



Richard Muth  
(1927–2018)



Edwin Mills  
(1928–2021)

⇒ **The monocentric city model (Alonso–Muth–Mills model)**

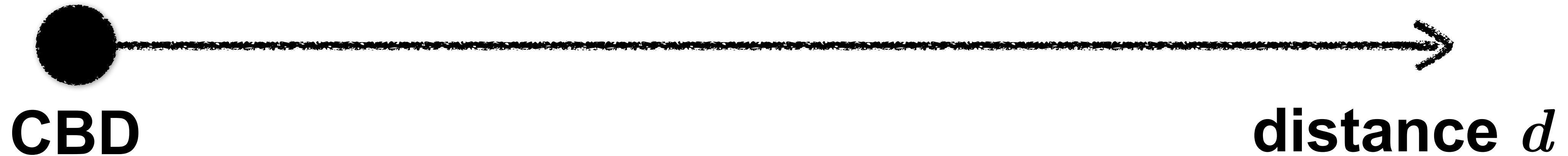
- The fundamental trade-off: **Accessibility** vs. **Floor Space**

# Key Assumptions

- **There is an exogenous, *single* CBD** (= “monocentric” city)
  - In reality, cities can have multiple business centers
  - Also, why does this center exist in the first place? ( $\Rightarrow$  economics of agglomeration)
- **Housing are malleable**
  - No material adjustment cost for housing construction / deconstruction
- **Featureless plain**
  - No exogenous difference in topography or climate.
- **The CBD is a single point**
- **Opportunity cost of land is a fixed constant**
  - “Agricultural rent”

# A City with Homogeneous Households

- Space



**The rest are discussed on the whiteboard  
(broad outline given as slides)**

# Utility Maximization of Households

# Bid Rent

# Basic Properties of Bid Rent

# Spatial Equilibrium

# Some Equivalences

# Indirect Utility Approach

# Spatial Equilibrium

# Amenities

# A Simple Worked Example

# Endogenous Amenities

# Urban Aggregates

# System of Cities

# A City with Heterogeneous Households

# Bid Rents

# Relative Steepness

# Spatial Equilibrium