Introduction

RE420: URBAN AND REGIONAL ECONOMICS

General Information

Canvas website (https://canvas.wisc.edu/courses/429265)

Lecture: Grainger 2190, M/W 4:00 pm – 5:15 pm

Office hour: Grainger 5298B, T/R 3:00 pm – 4:30 pm, or by appointment

Course Prerequisite: Econ 101 or 111

Instructor Information

Heejin Yoon (he/him/his)

Citizenship: South Korea

Education

Ph.D. Candidate in Real Estate from UW-Madison

M.S. in Finance from KAIST (South Korea)

B.B.A in Business (Finance) from Yonsei University (South Korea)

Work Experience

Economist at the Central Bank of Korea	2014-2018
Staff Sergeant at the ROK Air Force	2009-2011

Overview

- What is Urban Economics
- Learning Outcomes & Topics
- Course Logistics
- Stylized Facts in Urban Economics and Cities

What is Urban Economics

What is Urban Economics

- Study of Cities!
- The intersection of geography and economics.
  - Geographers study how things are arranged across space.
  - Economics explores the choices people make when resources are limited.
- *Urban Economics* puts economics and geography together, exploring the geographical or location choices of utility maximizing households and profit-maximizing firms.
  - E.g., why do cities exist?

    Historian: "Populations had to be concentrated in cities (within high walls) to defend against foreign attack."

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  - E.g., why do cities exist?

    Sociologist: "People like to interact socially, and that they must be spatially concentrated in cities."

What is Urban Economics

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- *Urban Economics* puts economics and geography together, exploring the geographical or location choices of utility maximizing households and profit-maximizing firms.
  - E.g., why do cities exist?

    Economist: "There are economic forces making employment concentrated in space, so people locate areas close to their worksites."

Learning Outcomes and Topics

Learning Outcomes

- Understand the relevance of economic analysis to real estate decisions.
- Understand why cities exist and what drives urban growth.
- Explain how the location decisions of households/firms are made and how these decisions impact housing prices, land use, labor market, and many other aspects of cities.
- Learn spatial equilibrium concepts and understand their implications for urban development and real estate decisions.
- Understand statistical models to assess residential/commercial real estate and perform sensible business and policy analysis.
- Understand cycles, risks, and bubbles in residential and commercial real estate markets.
- Learn why socially responsible and environmentally sustainable urban development is a big challenge in the U.S. and around the world.
- Work on a project focusing on sustainable city and neighborhood development for the City of Madison.

Learning Outcomes

1. Urban economic theory with real-world applications
   - Use of the Monocentric City Model to explain city size determination
   - Application of the Rosen-Roback Model to measure city quality of life
2. Housing data analysis using statistical tools and packages
   - Multivariate regression with a hedonic modelling framework
   - Experience to work with CoStar database
3. Contribution to the city planning for sustainable development
   - Collaboration with the city of Madison urban planners and mayor's office

Learning Outcomes

Poster Session (12/13/2023, @Grainger Hall)

News article: https://univercity.wisc.edu/2024/01/10/madison-based-sustainability-projects-motivate-wisconsin-school-of-business-students/

Main Topics

Economics of Housing Market

- Agglomeration and the growth of cities
- Housing supply and demand
- Elasticities
- Durable housing

Spatial Equilibrium: Location Choice Models

- Location choice within a city: Monocentric city model
- Location choice across cities: Rosen-Roback model

Real Estate Valuation and House Price Index

- Real estate valuation and applications
- Hedonic and repeated-sales price indices

Main Topics

Commercial Real Estate

- Commercial real estate analysis using CoStar
- Business location and market competition

Real Estate Market

- The four-quadrant (4Q) model of real estate markets
- Real estate investment, speculation, and bubbles

Other

- Suburbanization and segregation
- Sustainable development

Course Logistics

Course Materials

- There is no textbook required for this course. Instead, I will post detailed lecture notes for each lecture on the Canvas course website

- I recommend the following books for those interested in getting a little more depth on the material seen in class
  - Arthur O'Sullivan, *Urban Economics*, 9th ed. ISBN: 978-0-078-02178-7
  - Jan K. Brueckner, *Lectures on Urban Economics*. ISBN: 978-0262016360
  - Edward L. Glaeser, *Triumph of the City*. ISBN: 978-0-14-312054-4

Course Website

- All class material will be available on the Canvas website (https://canvas.wisc.edu/courses/429265)
- Students are expected to be familiar with the functioning of this website.
- Every student must update their information and upload a picture as soon as possible.

Course Requirement

- 5% attendance & participation
- 20% assignments
- 20% in-class exam I
- 20% in-class exam II
- 35% group project on sustainable development:
  - 10% presentation
  - 20% quality of the group project report
  - 5% group peer evaluation

Attendance & Class Participation

- I expect all students to attend every class at the scheduled time. If you cannot participate in some classes, you should write email to me in advance for approval
- The student should also participate in class, with questions during the lectures, debates, and other students' presentations
- To encourage active participation, I will give 5 points (out of 100) to those outstanding students that actively participate in class

Exams

- There are two mid-term exams, but no final exam
- There will be multiple-choice questions, short- and long-answer questions about the materials covered in classes in the exams
  - More details will be announced later before the exam
- For the long questions, a good answer should have the following four elements:
  - Assumptions (and model if it is relevant);
  - Economic intuition;
  - Numerical example or graphics (if it is relevant);
  - Supports theoretical arguments with empirical facts (if it is relevant)

Group Project

- Students will be formed into small groups (of four students) to work on a group project
- The group project will focus on sustainable city and neighborhood development for the City of Madison
- There will be lectures, guest speakers, reading materials, online video materials, and case studies, helping students to get familiar with the issues

Group Project

- Group members will write a group project report and present their main findings in class, as well as in the poster session.
  - In-class presentation: December 2, 4, 9.
  - Poster session

    Date / Time: **December 11, 2024**, 2:00 pm – 4:30 pm.

    Venue: The Madison Municipal Building (215 Martin Luther King Jr Blvd), 2nd Floor, Room 215

    Please notify me about any foreseen conflicts with the poster session schedule.

Other Assignments

- In-class group debate (9/23)
  - Topic: The Future of Detroit
  - Reference: "Why Do Cities Decline?" Ch. 2 of *Triumph of the City* by Ed Glaeser
- 3 individual assignments
  - 2-page review essay
  - Data analysis using Excel and Stata
  - Data practice using CoStar database

Digital Course Evaluation

UW-Madison uses a digital course evaluation survey tool (https://kb.wisc.edu/luwmad/81069). In most instances, students receive an official email two weeks prior to the end of the semester, notifying them that course evaluations are available. Students receive an email with a link to log into the course evaluation with their NetID. Evaluations are anonymous. Student participation is an integral component of course development, and feedback is important. UW-Madison strongly encourages student participation in course evaluations.

Academic Integrity

By virtue of enrollment, each student agrees to uphold the high academic standards of the University of Wisconsin-Madison; academic misconduct is behavior that negatively impacts the integrity of the institution. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these previously listed acts are examples of misconduct that may result in disciplinary action. Examples of disciplinary sanctions include, but are not limited to, failure on the assignment/course, written reprimand, disciplinary probation, suspension, or expulsion. For more information, refer to https://conduct.students.wisc.edu/academic-misconduct/.

Lecture Materials and Recordings

Lecture materials and recordings for RE420, Urban and Regional Economics, are protected intellectual property at UW-Madison. Students in courses may use the materials and recordings for their personal use related to participation in class. Students may also take notes solely for their personal use. If a lecture is not already recorded, students are not authorized to record lectures without permission unless they are considered by the university to be a qualified student with a disability who has an approved accommodation that includes the recording. [Regent Policy Document 4-1] Students may not copy or have lecture materials and recordings outside of class, including posting on internet sites or selling to commercial entities, with the exception of sharing copies of personal notes as a notetaker through the McBurney Disability Resource Center. Students are otherwise prohibited from providing or selling their personal notes to anyone else or being paid for taking notes by any person or commercial firm without the instructor's express written permission. Unauthorized use of these copyrighted lecture materials and recordings constitutes copyright infringement and may be addressed under the university's policies, UWS Chapters 14 and 17, governing student academic and non-academic misconduct.

Accommodations for Students with Disabilities

The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (UW-855) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities are a shared faculty and student responsibility. Faculty and students share responsibility in the accommodation process. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester or as soon as possible after a disability has been incurred or recognized. Faculty will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA. (See: McBurney Disability Resource Center)

Diversity & Inclusion

Diversity (https://diversity.wisc.edu/) is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals. The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who, as students, faculty, and staff, serve Wisconsin and the world.

Stylized Facts
in Urban Economics and Cities

- **<u>Stylized Fact 1</u>**:

  People and economic activities are concentrated in cities, and the trend remains ongoing

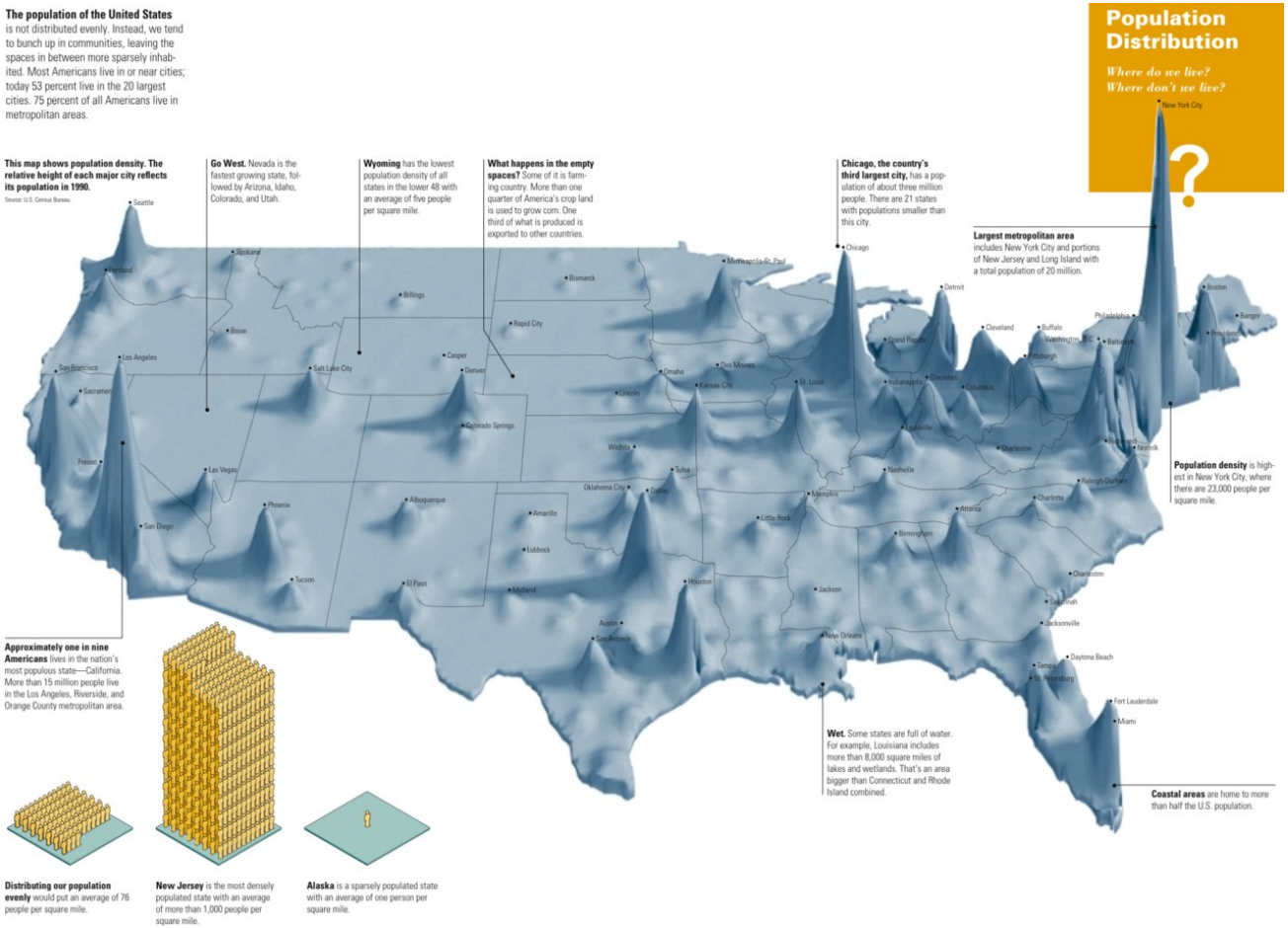
Census definition of urban area

- Urban Area: an urban area comprises a densely settled core of census blocks that meet minimum housing unit (2,000) and/or population (5,000) requirements (Census, 2020)

(Updated June 2023)

	United States
Total number of 2020 Census Urban Areas	2,611
Total urban population	265,149,027
Percent population living within urban areas	80.0%
Total rural population	66,300,254
Percent population living within rural areas	20.0%

→ Only 3% of total land area in the US is urban area



- **Manhattan**:
  - Pop: 1.69 million (2020 U.S. Census);
  - Area: 22.83 sq. mi;
  - Density: 74,025 persons / sq. mi.
- **State of Wyoming**:
  - Pop: 573,909 (2020 U.S. Census);
  - Area: 97,813 sq. mi;
  - Density: 5.87 persons / sq. mi.

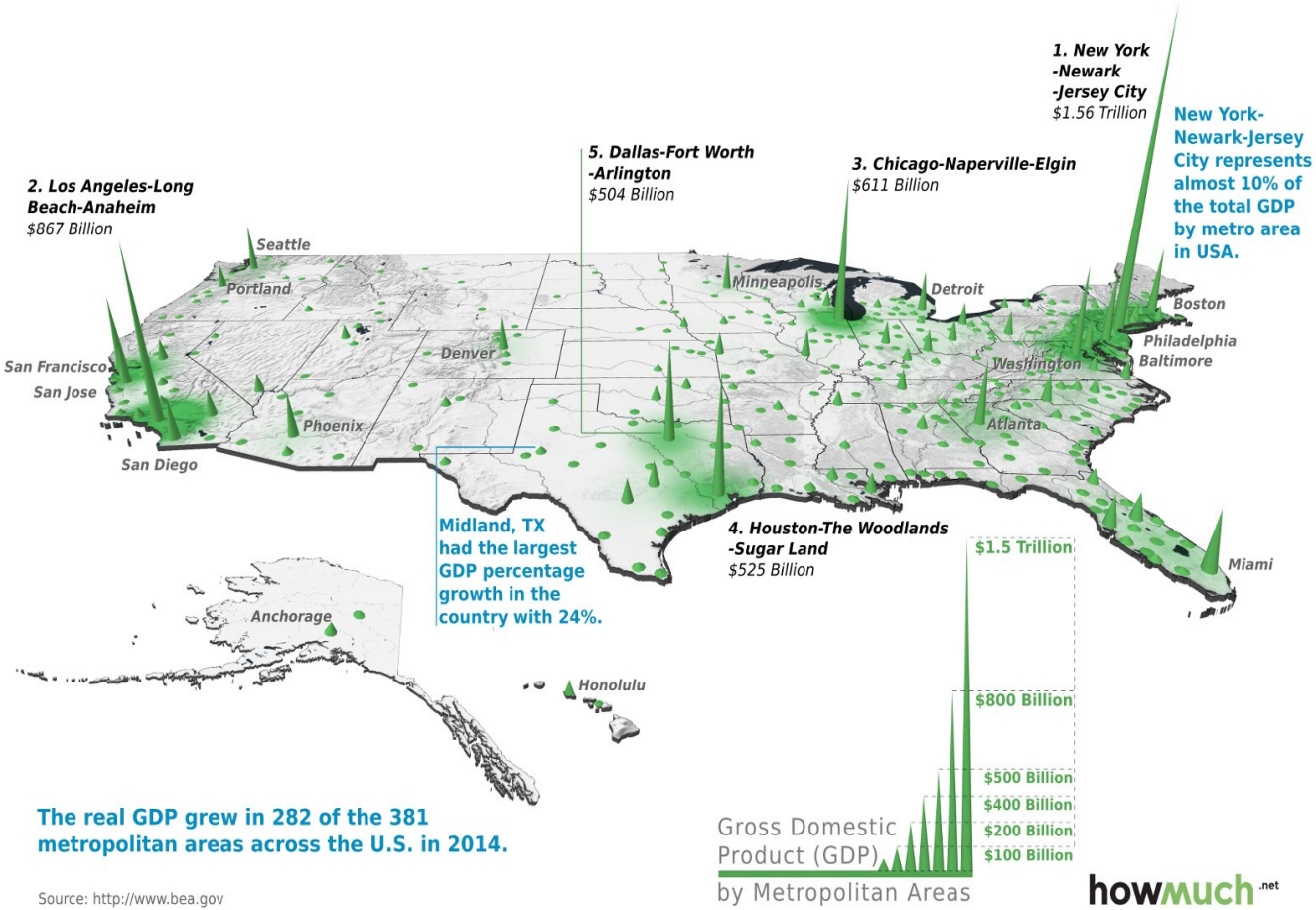
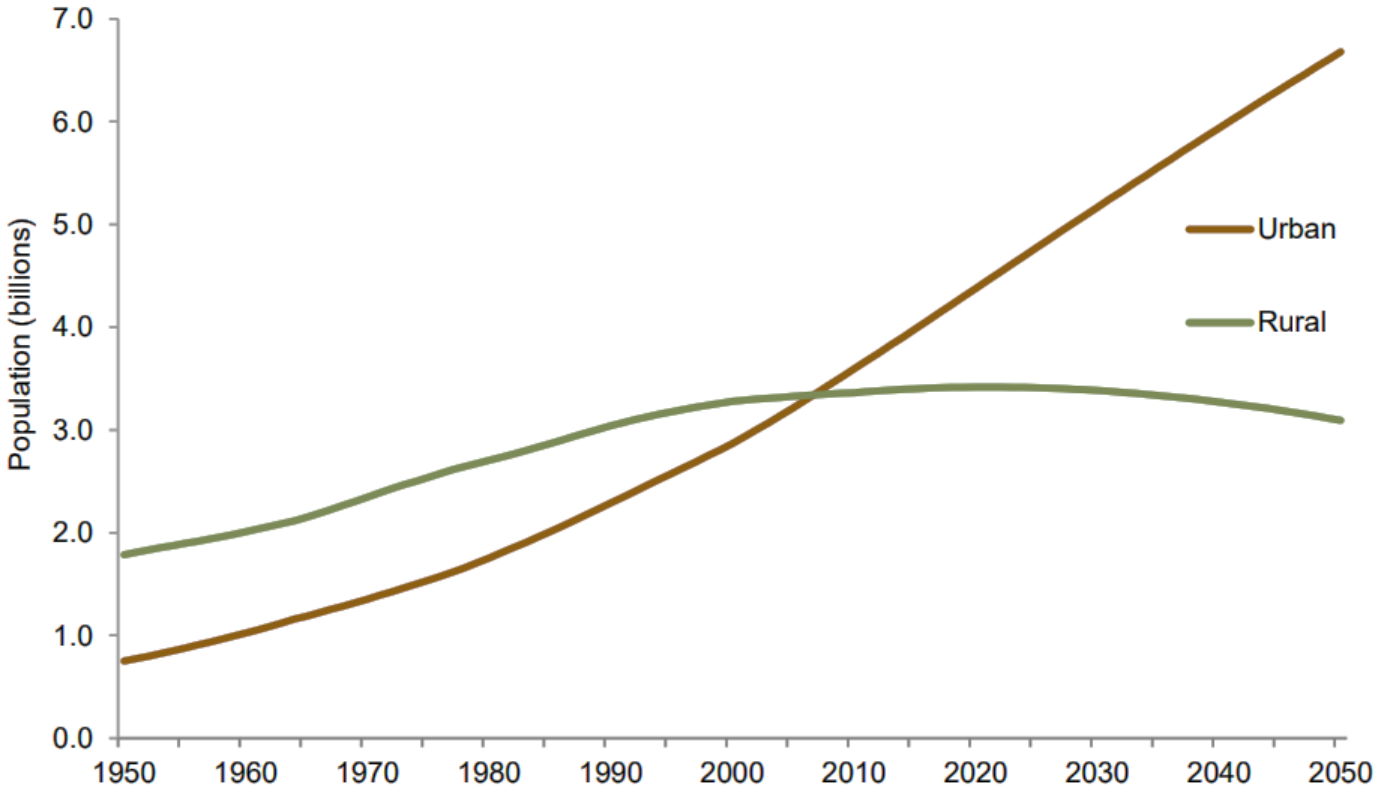
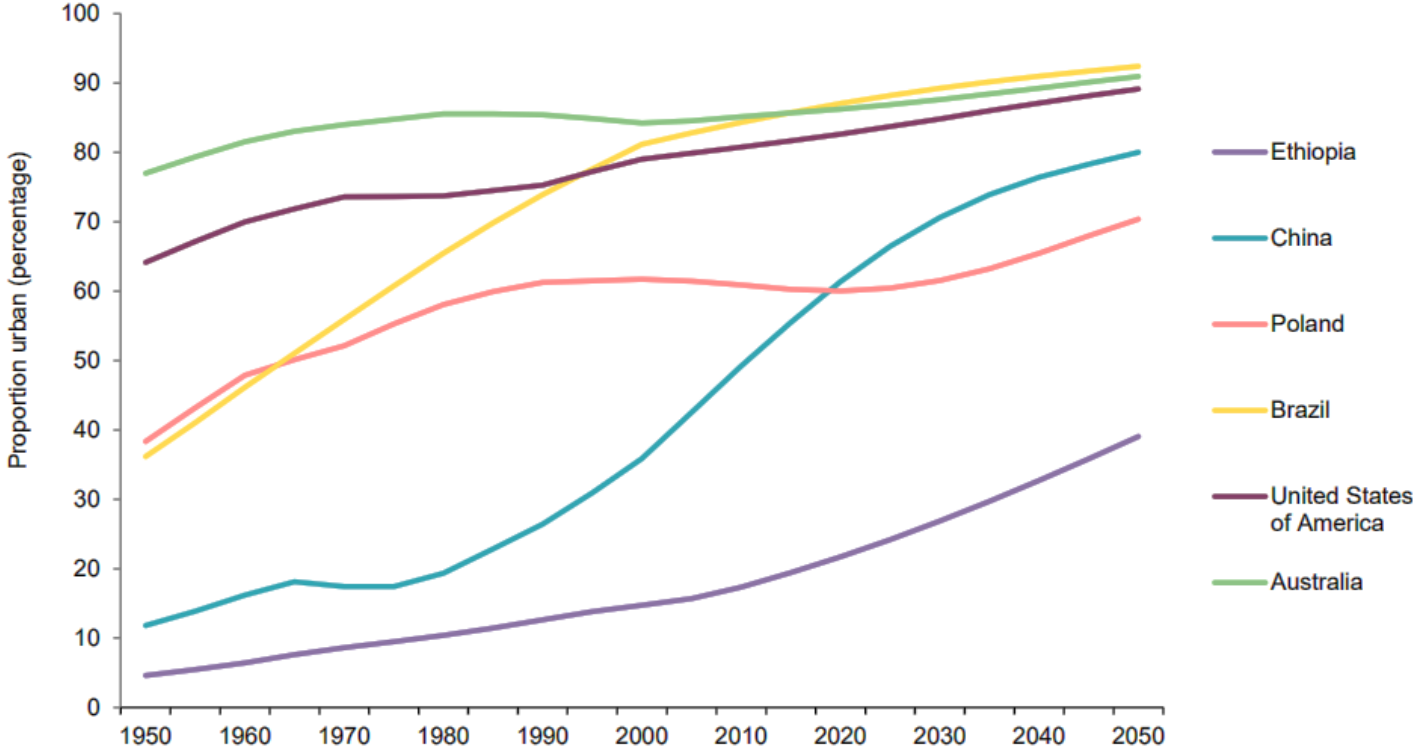

1. New York -Newark -Jersey City
$1.56 Trillion
New York-Newark-Jersey City represents almost 10% of the total GDP by metro area in USA.
2. Los Angeles-Long Beach-Anaheim
$867 Billion
5. Dallas-Fort Worth -Arlington
$504 Billion
3. Chicago-Naperville-Elgin
$611 Billion
Seattle
Portland
Minneapolis
Detroit
Boston
Philadelphia
Baltimore
Washington
San Francisco
San Jose
Denver
Phoenix
Atlanta
San Diego
Midland, TX had the largest GDP percentage growth in the country with 24%.
4. Houston-The Woodlands -Sugar Land
$525 Billion
Miami
Anchorage
Honolulu
$1.5 Trillion
$800 Billion
$500 Billion
$400 Billion
$200 Billion
$100 Billion
Gross Domestic Product (GDP) by Metropolitan Areas
howmuch.net
The real GDP grew in 282 of the 381 metropolitan areas across the U.S. in 2014.
Source: http://www.bea.gov

Figure 1. Urban and rural populations of the world, 1950-2050



Data source: United Nations, Department of Economic and Social Affairs, Population Division (2018a). *World Urbanization Prospects 2018.*

Figure 5. Percentage of population residing in urban areas for selected countries, 1950-2050



Data source: United Nations, Department of Economic and Social Affairs, Population Division (2018a). *World Urbanization Prospects 2018*.

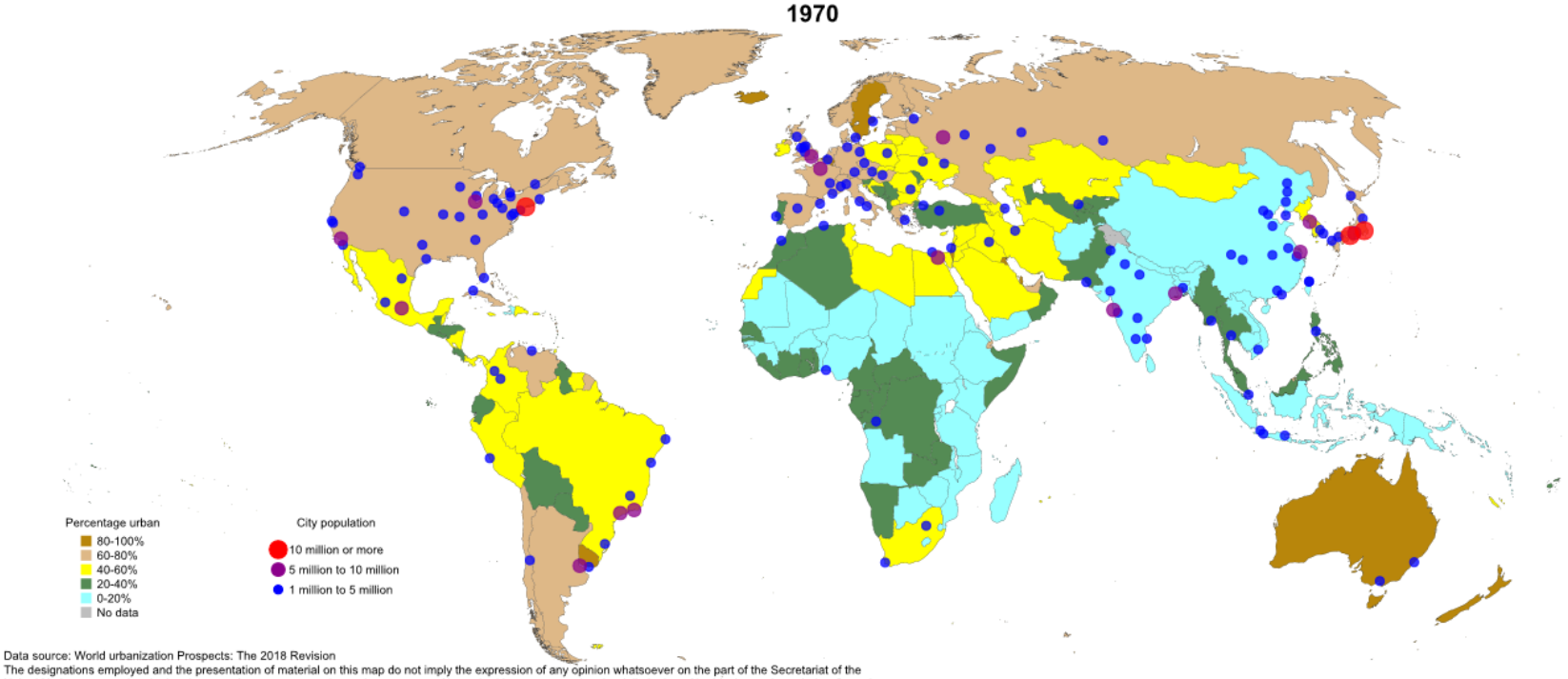
- **<u>Stylized Fact 2</u>**:

  Developing countries have larger cities

Developing countries have the largest cities

Metropolitan Area	Nation	Population 1975 (million)	Population 2005 (million)	Population 2015 (million)	Percent Change 2005–2015
Tokyo	Japan	26.6	35.2	35.5 37.274 (2022)	1
Ciudad de México (Mexico City)	Mexico	10.7	19.4	21.6 22.085 (2022)	11
Sao Paulo	Brazil	9.6	18.3	20.5 22.430 (2022)	12
Mumbai (Bombay)	India	7.1	18.2	21.9 20.961 (2022)	20
Delhi	India	4.4	15.0	18.6 32.066 (2022)	24
Shanghai	China	7.3	14.5	17.2 28.517 (2022)	19
Kolkata (Calcutta)	India	7.9	14.3	17.0	19
Jakarta	Indonesia	4.8	13.2	16.8	27
Buenos Aires	Argentina	8.7	12.6	13.4	7
Dhaka	Bangladesh	2.2	12.4	16.8 22.478 (2022)	35
Karachi	Pakistan	4.0	11.6	15.2	31
Rio de Janeiro	Brazil	7.6	11.5	12.8	11
Osaka-Kobe	Japan	9.8	11.3	11.3	0
Al-Qahirah (Cairo)	Egypt	6.4	11.1	13.1	18
Lagos	Nigeria	1.9	10.9	16.1	48
Beijing	China	6.0	10.7	12.9 21.333 (2022)	20
Manila	Philippines	5.0	10.7	12.9	21
Moskva (Moscow)	Russian Federation	7.6	10.7	11.0	3
Paris	France	8.6	9.8	9.9	0
Istanbul	Turkey	3.6	9.7	11.2	15

Percentage urban & urban agglomerations by size class



Data source: World urbanization Prospects: The 2018 Revision

The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. Final boundary between the Republic of Sudan the Republic of South Sudan has not yet been determined. A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Malvinas).

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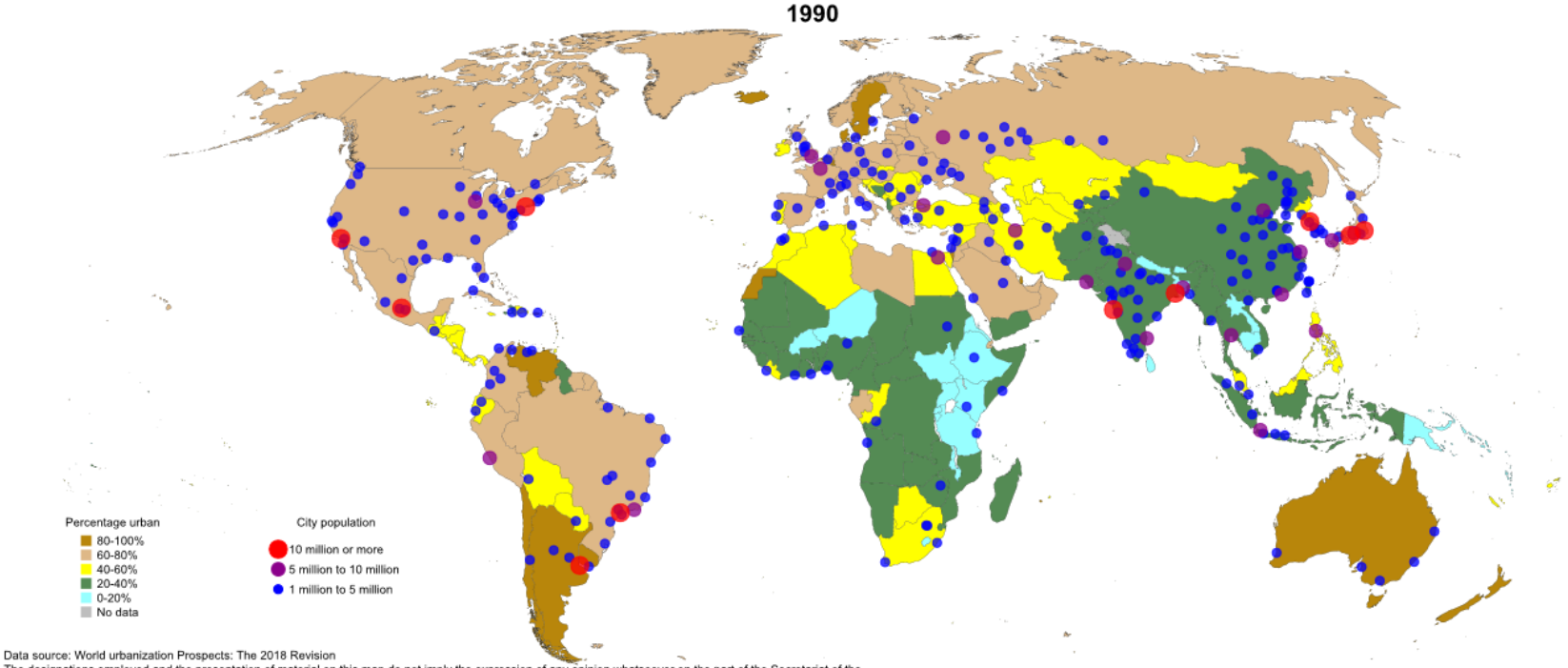

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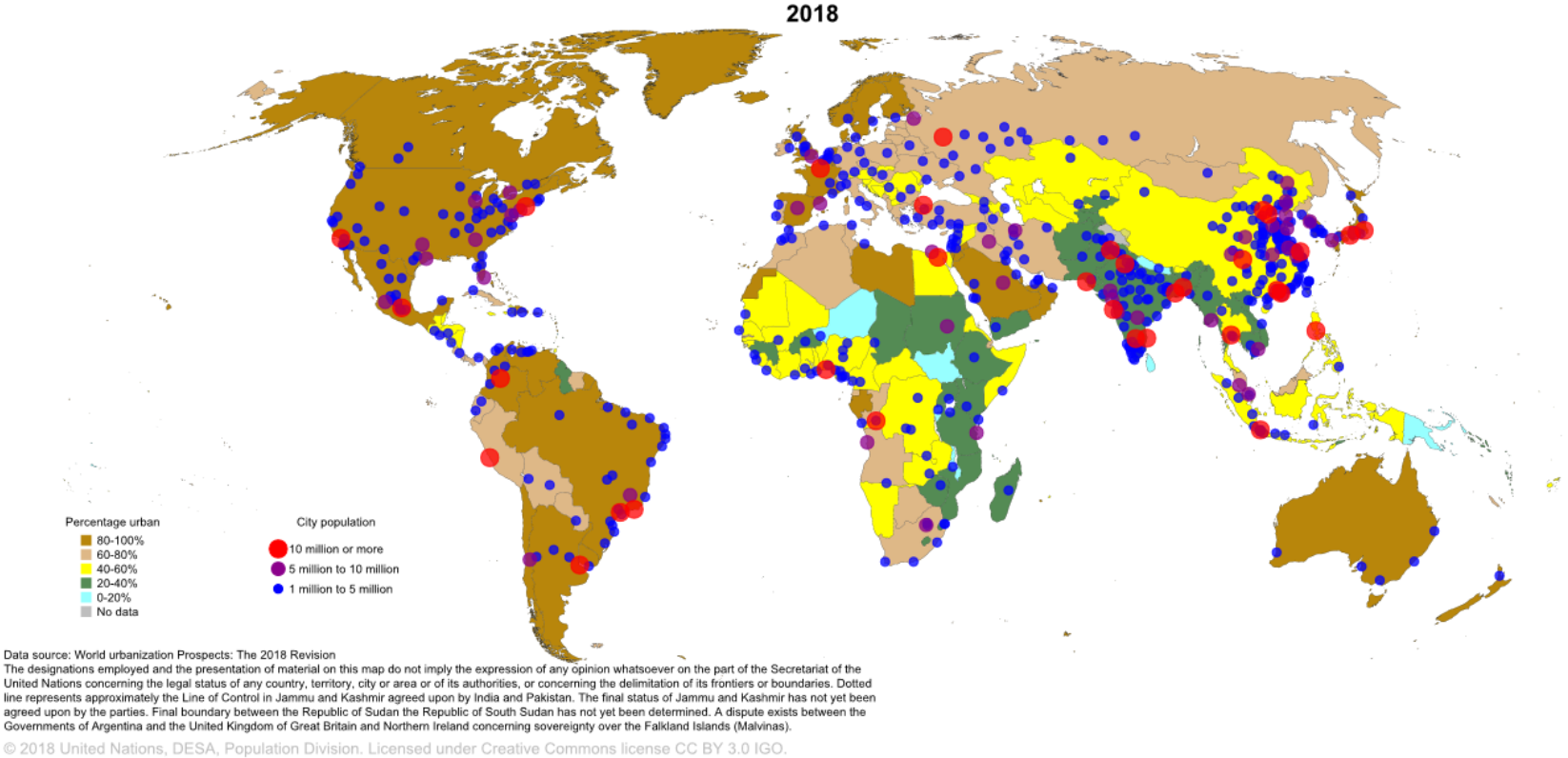

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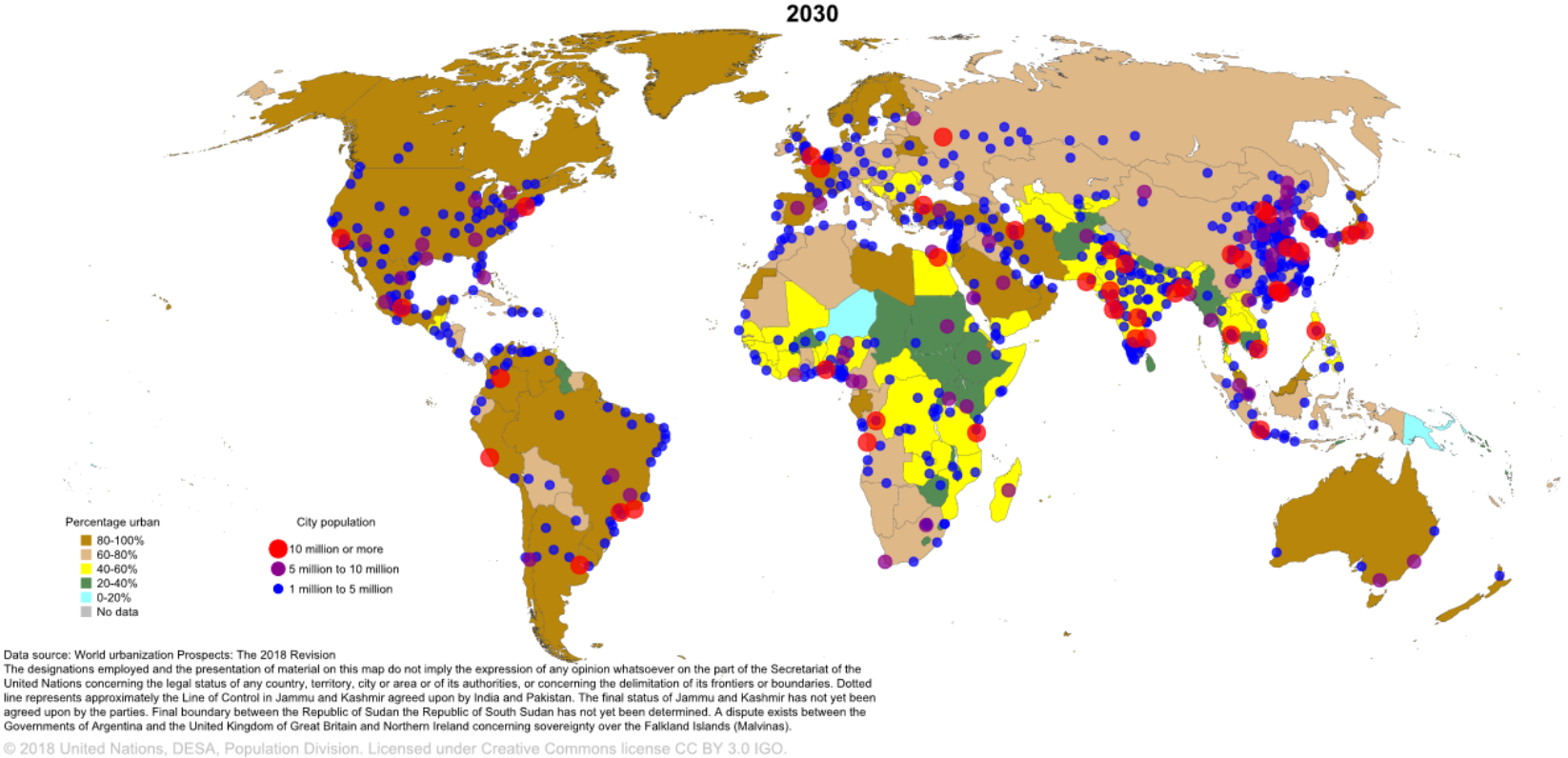
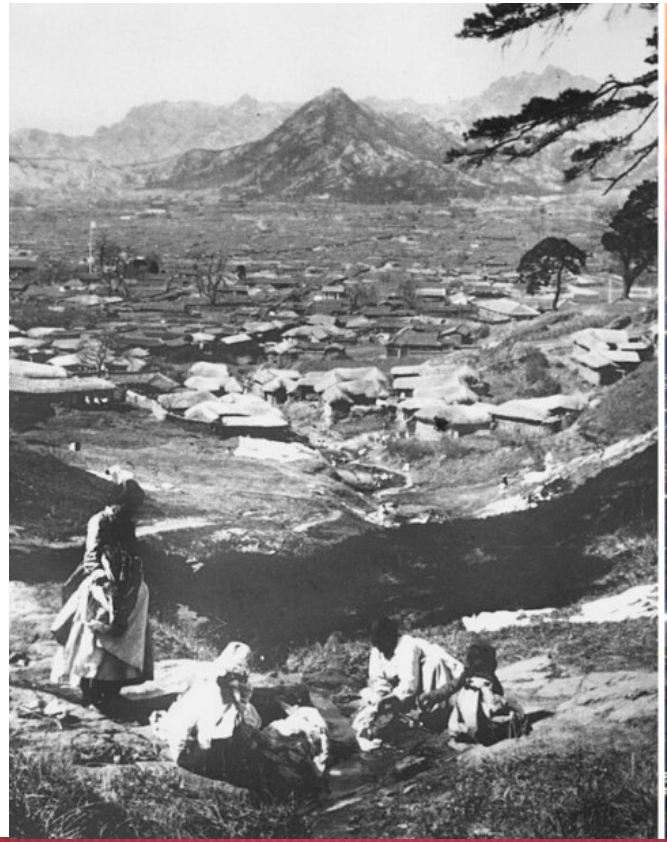


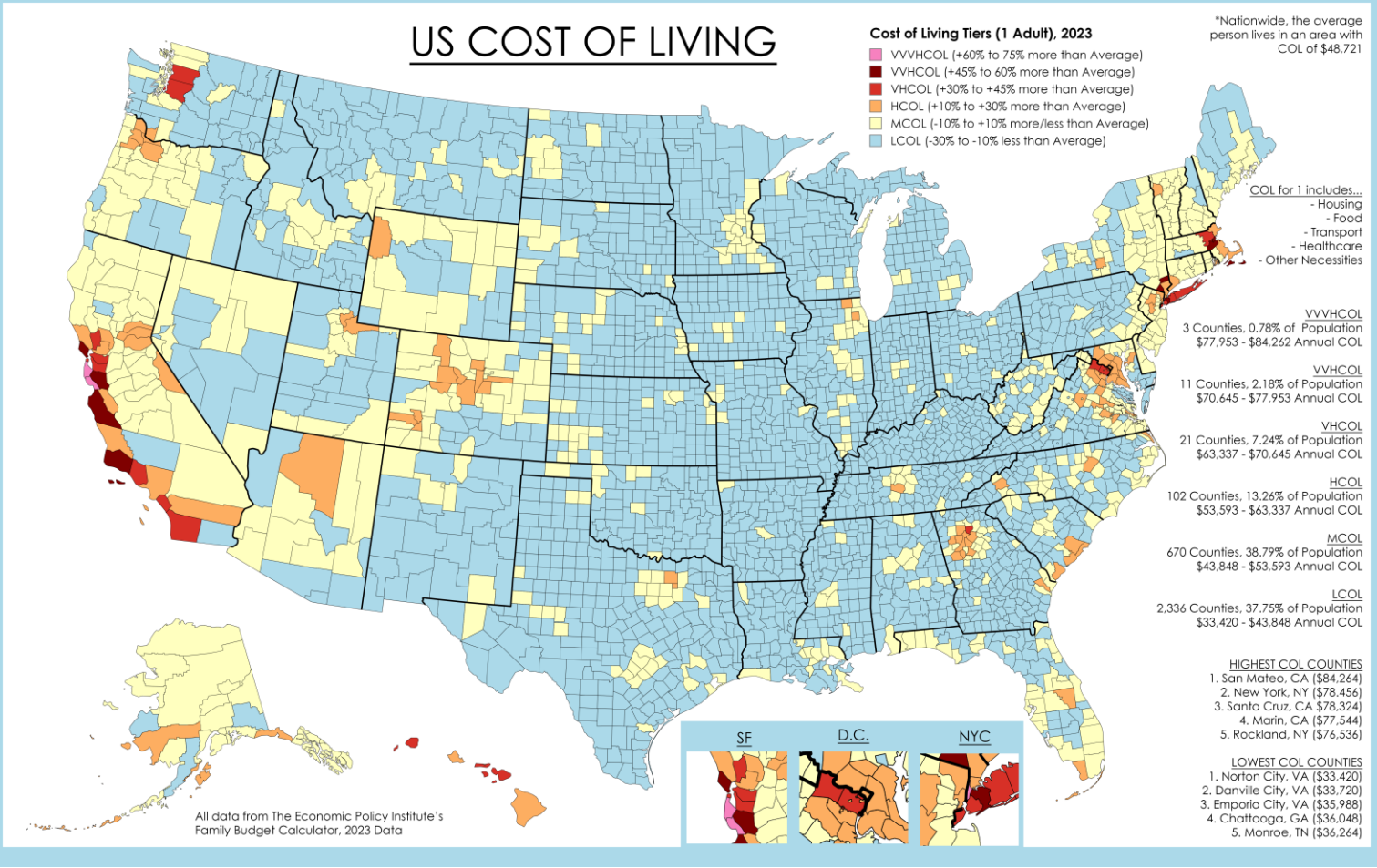
Seoul in 1900 vs. 2018



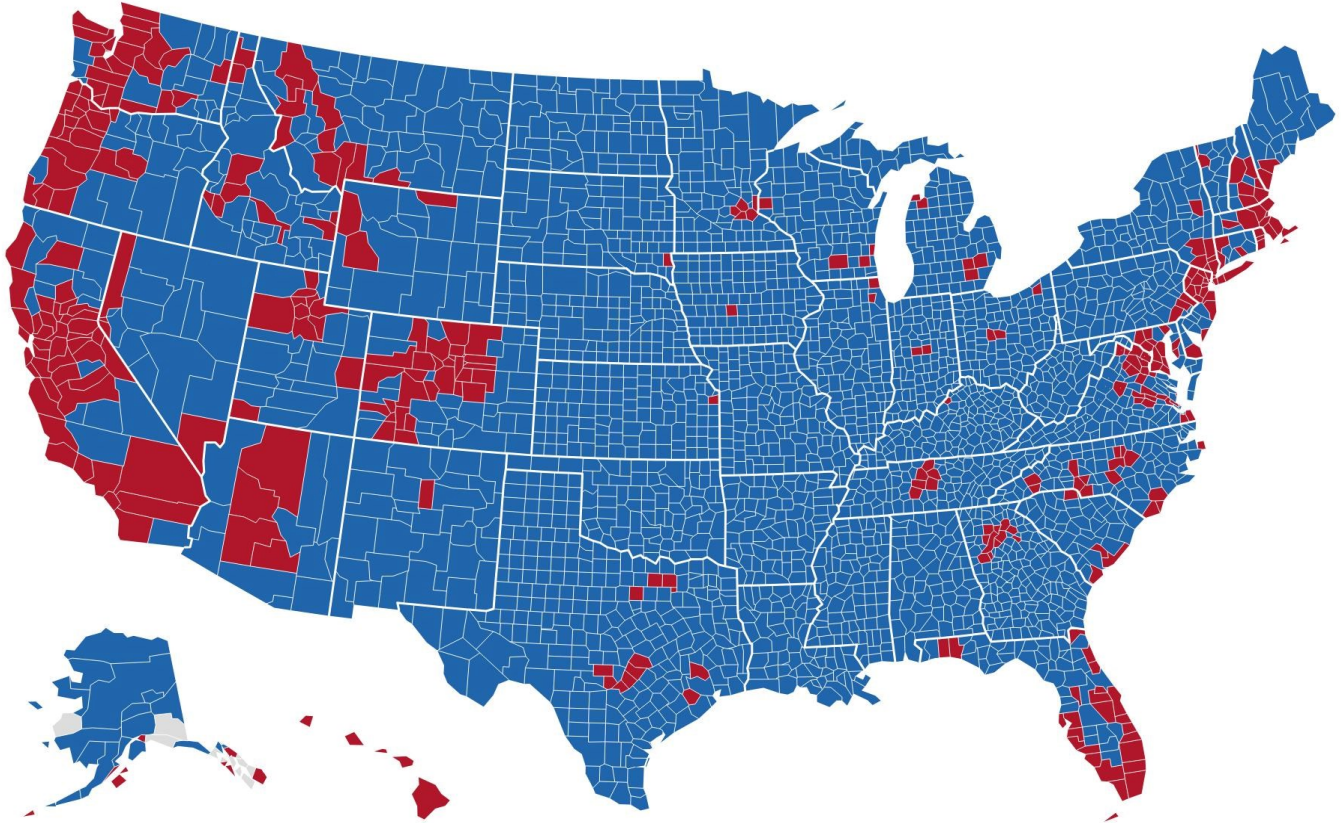
Manhattan in 1920 vs. 2020

- **<u>Stylized Fact 3</u>**:

  Cities are expensive to live


US COST OF LIVING
Cost of Living Tiers (1 Adult), 2023
VVVHCOL (+60% to 75% more than Average)
VVHCOL (+45% to 60% more than Average)
VHCOL (+30% to +45% more than Average)
HCOL (+10% to +30% more than Average)
MCOL (-10% to +10% more/less than Average)
LCOL (-30% to -10% less than Average)
*Nationwide, the average person lives in an area with COL of $48,721
COL for 1 includes...
- Housing
- Food
- Transport
- Healthcare
- Other Necessities
VVVHCOL
3 Counties, 0.78% of Population
$77,953 - $84,262 Annual COL
VVHCOL
11 Counties, 2.18% of Population
$70,645 - $77,953 Annual COL
VHCOL
21 Counties, 7.24% of Population
$63,337 - $70,645 Annual COL
HCOL
102 Counties, 13.26% of Population
$53,593 - $63,337 Annual COL
MCOL
670 Counties, 38.79% of Population
$43,848 - $53,593 Annual COL
LCOL
2,336 Counties, 37.75% of Population
$33,420 - $43,848 Annual COL
HIGHEST COL COUNTIES
1. San Mateo, CA ($84,264)
2. New York, NY ($78,456)
3. Santa Cruz, CA $78,324)
4. Marin, CA ($77,544)
5. Rockland, NY ($76,536)
LOWEST COL COUNTIES
1. Norton City, VA ($33,420)
2. Danville City, VA ($33,720)
3. Emporia City, VA ($35,988)
4. Chattooga, GA ($36,048)
5. Monroe, TN ($36,264)
SF
D.C.
NYC
All data from The Economic Policy Institute's Family Budget Calculator, 2023 Data

Counties with Median House Price >$350k, Q4 2023



Map: StatisticUrban • Created with Datawrapper

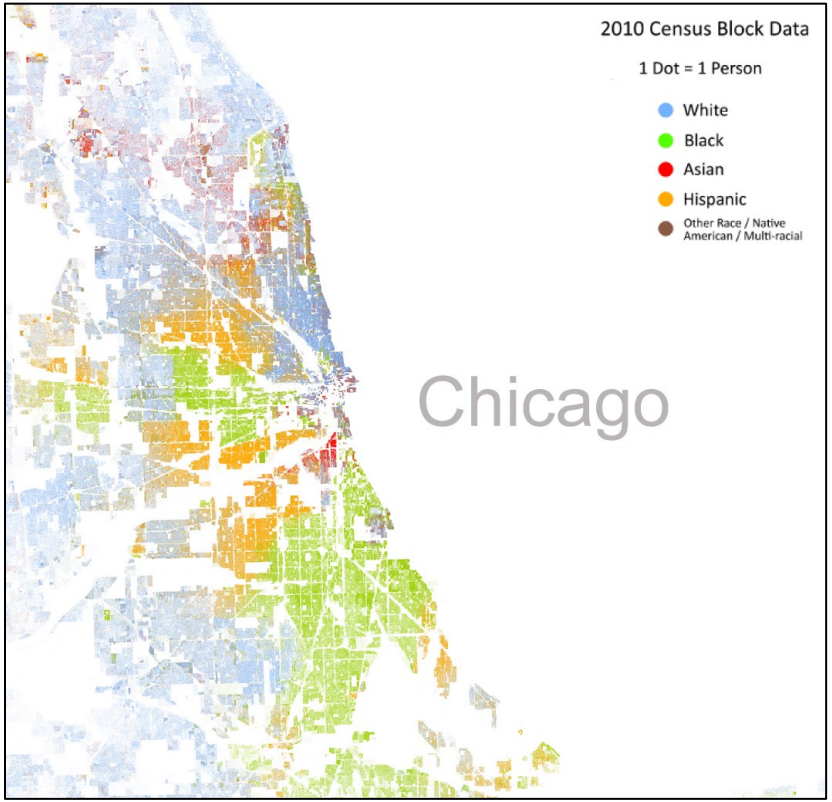
- **<u>Stylized Fact 4</u>**:

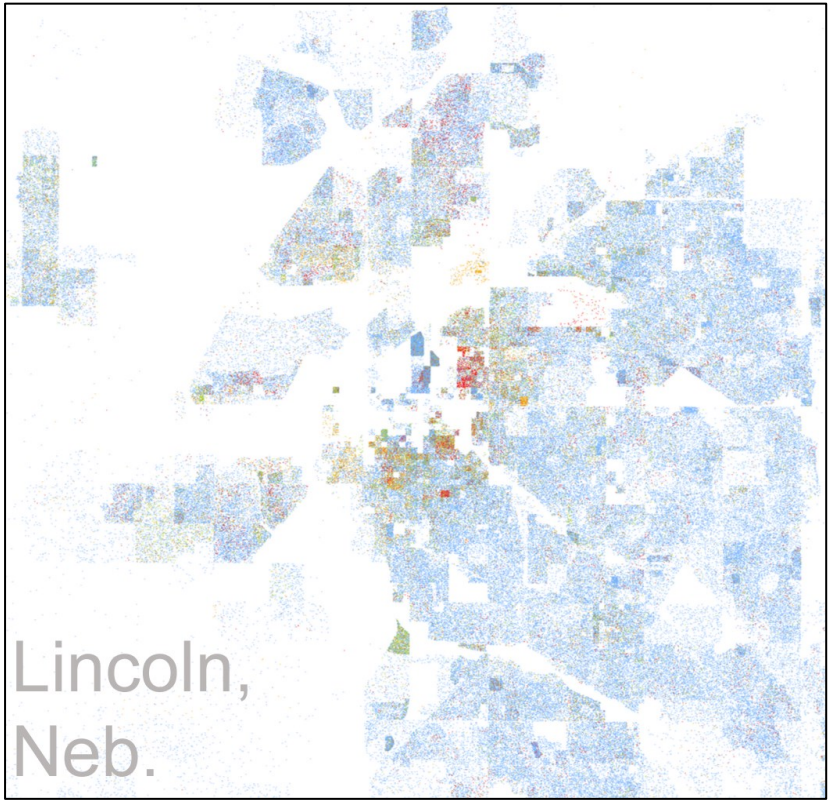
  Cities are different

Cities are different

- Key industry: Finance in Manhattan / Tech in Seattle / Auto in Detroit
- Transportation system
- Density
- Integration/segregation
- Crime rate
- Air quality

Segregation



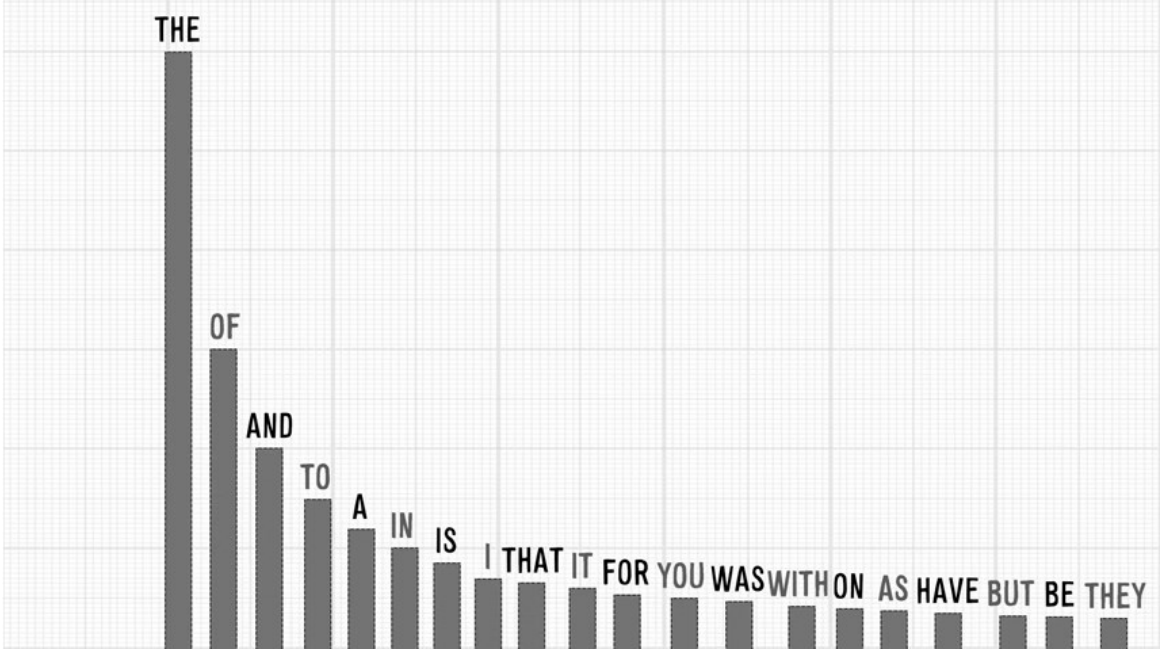


- **<u>Stylized Fact 5</u>**:

  City sizes follow a mysterious Zipf's law

Zipf's Law

- Linguist George Zipf found that the frequency of any word is inversely proportional to its rank in the frequency table



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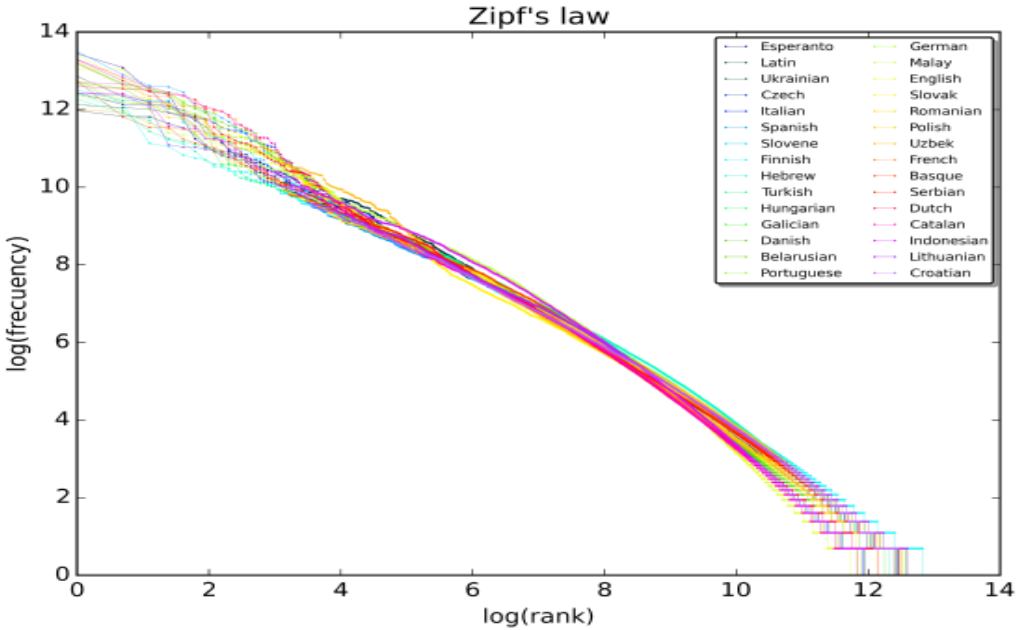

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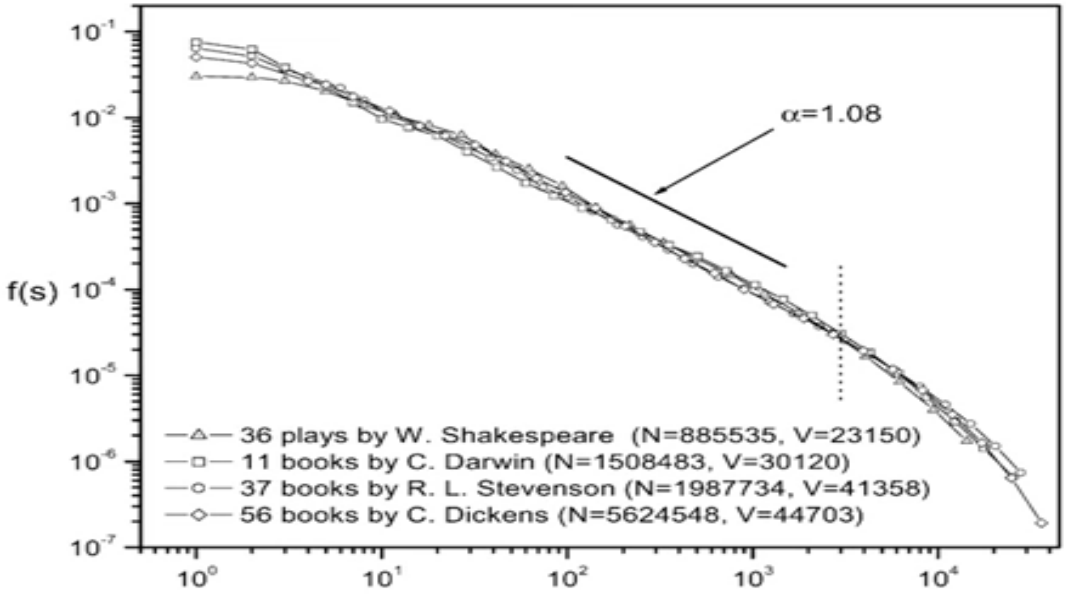
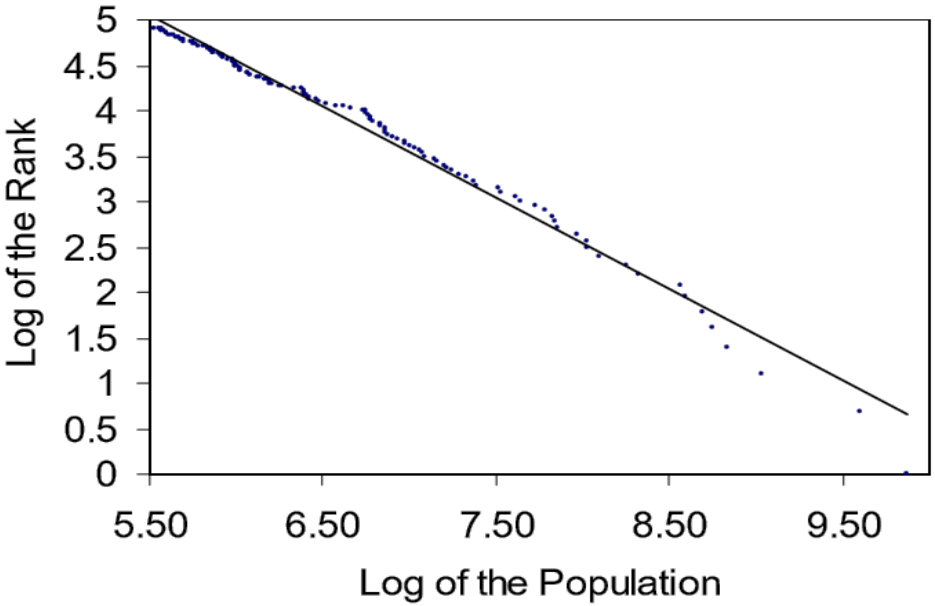


The size of cities seemingly follow the same rule

- In 1999, a French economist Xavier Gabaix wrote a much-cited *Quarterly Journal of Economics* paper where he described Zipf's law for city sizes



- Linear estimation give us:

$$\log(Rank) = 10.53 - 1.005 \times \log(Size)$$

- Why does it hold?