TRIUMPH OF THE HIGH-AMENITY CITY?

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3 October 2019

Around the world, cities are growing.
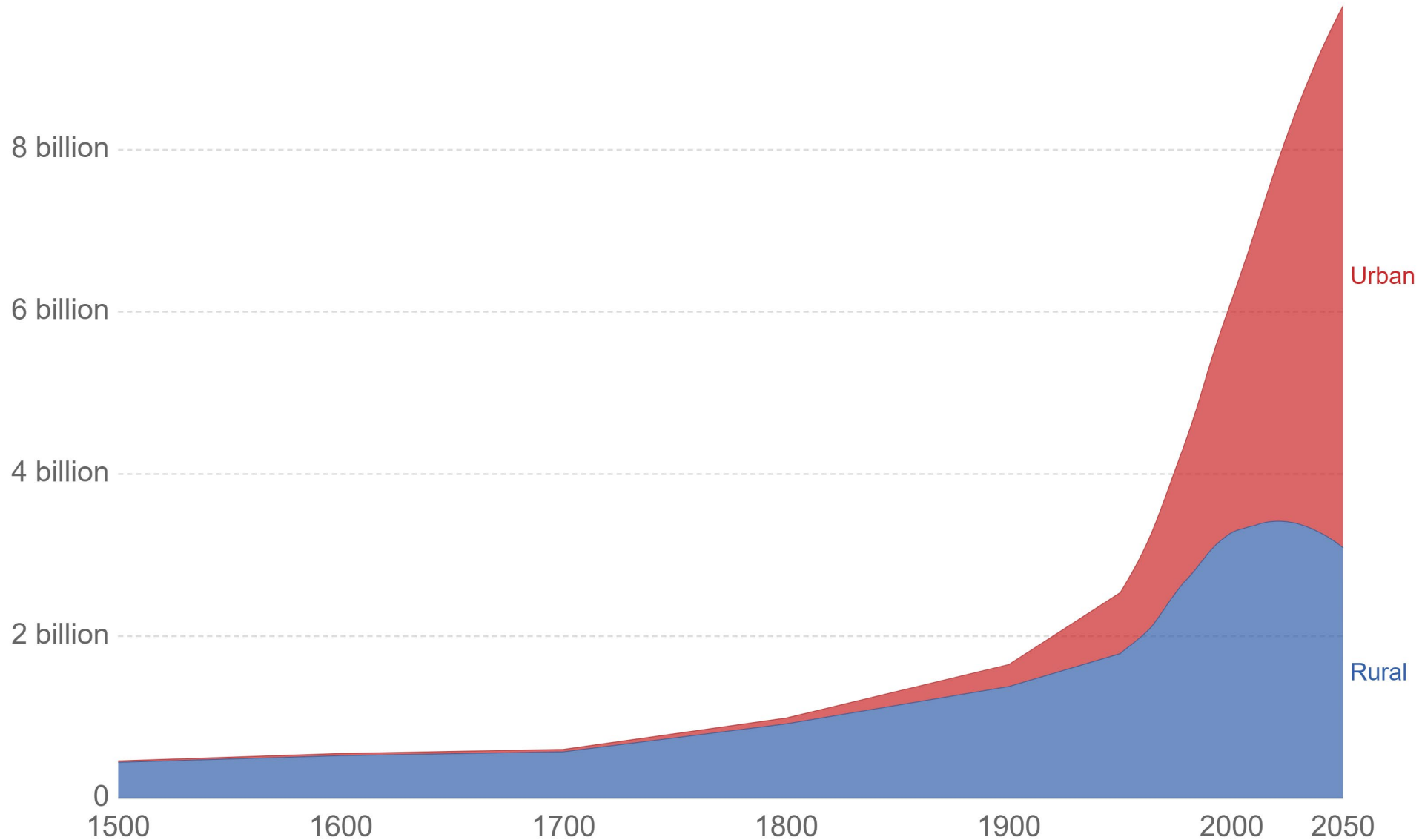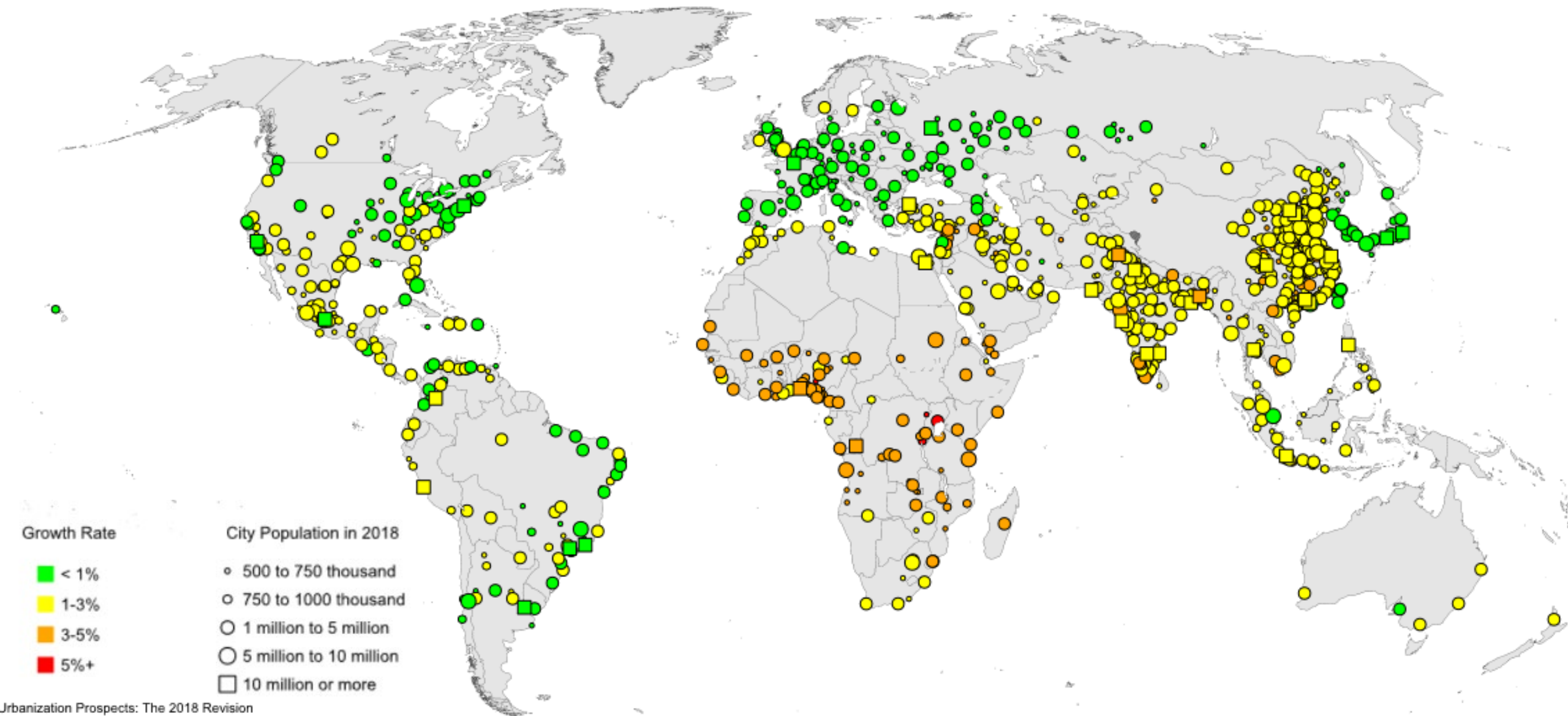
Urban and rural population projected to 2050, World

Total urban and rural population, given as estimates to 2016, and UN projections to 2050. Projections are based on the UN World Urbanization Prospects and its median fertility scenario.

Urban

Rural

2018-2030

Growth Rate

- 🟩 < 1%
- 🟨 1-3%
- 🟧 3-5%
- 🟥 5%+

City Population in 2018

- ◦ 500 to 750 thousand
- ○ 750 to 1000 thousand
- ○ 1 million to 5 million
- ○ 5 million to 10 million
- ▢ 10 million or more

https://population.un.org/wup/Maps/

Around the world, cities are growing.

Why?

Urban population vs. GDP per capita, 1500 to 2016

Share of the total population living in urban areas versus gross domestic product (GDP) per capita, measured in 2011 international-$.

Legend:
- Africa
- Asia
- Europe
- North America
- Oceania
- South America

1500 ➝ 2016

Country labels visible in plot: Belgium, Singapore, Qatar, Uruguay, Argentina, Japan, Luxembourg, Brazil, Chile, Australia, United States, Oman, Mexico, Greece, Libya, Germany, Djibouti, Cuba, Peru, Iran, Russia, Switzerland, Sao Tome and Principe, Bolivia, Ukraine, Italy, Latvia, Congo, South Africa, Portugal, Ireland, North Korea, Morocco, Poland, Gambia, Nicaragua, China, Croatia, Austria, Haiti, Ghana, Indonesia, Slovakia, Mauritania, Guatemala, Nigeria, Thailand, Liberia, Benin, Philippines, Democratic Republic of Congo, Moldova, Mali, Egypt, Mauritius, Mozambique, Tanzania, India, Zimbabwe, Comoros, Myanmar, Kenya, Uganda, Cambodia, Ethiopia, Niger, Rwanda, Sri Lanka, Burundi

Y-axis: Share of population living in urban areas (0% to 100%)
X-axis: GDP per capita (2011 int-$) — $134, $1,000, $10,000, $100,000

Our World in Data

Urban population vs. GDP per capita, 1500 to 2016

Share of the total population living in urban areas versus gross domestic product (GDP) per capita, measured in 2011 international-$.

Our World in Data

- Africa
- Asia
- Europe
- North America
- Oceania
- South America

1500 ●—→ 2016

New Zealand
1950
Y Axis: 72.52%
X Axis: $11,666
2016
Y Axis: 86.4%
X Axis: $34,040

Share of population living in urban areas

GDP per capita (2011 int-$)

Source: OWID based on UN World Urbanization Prospects (2018), Maddison Project Database (2018)   OurWorldInData.org/urbanization • CC BY

Around the world, cities are growing.

Why? Income growth. And?

Labour productivity

Chart 7: Productivity by Sector – 1947 to 2015
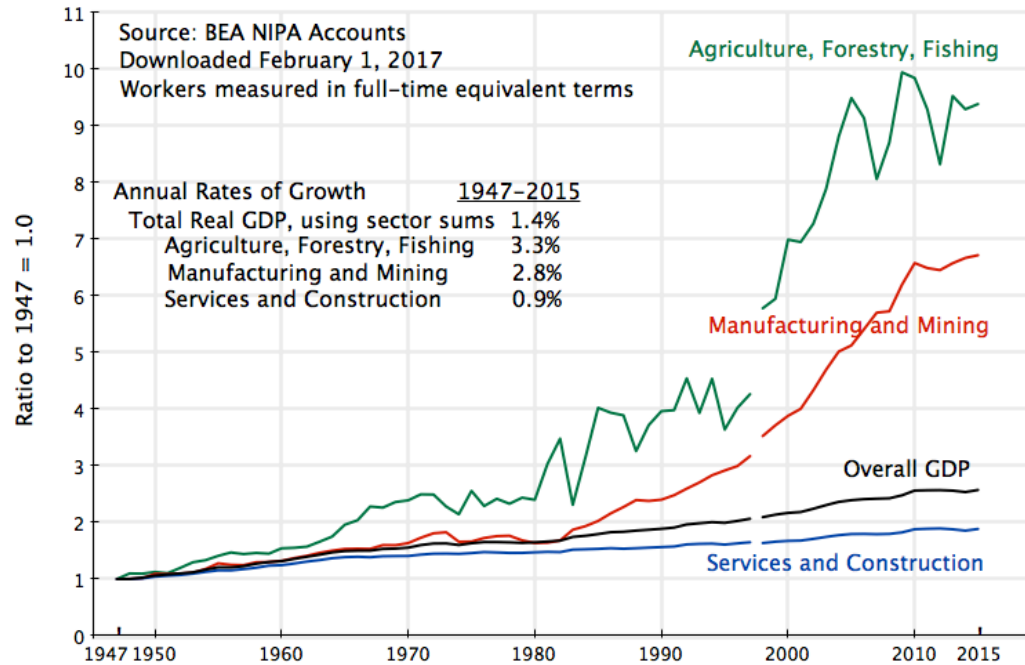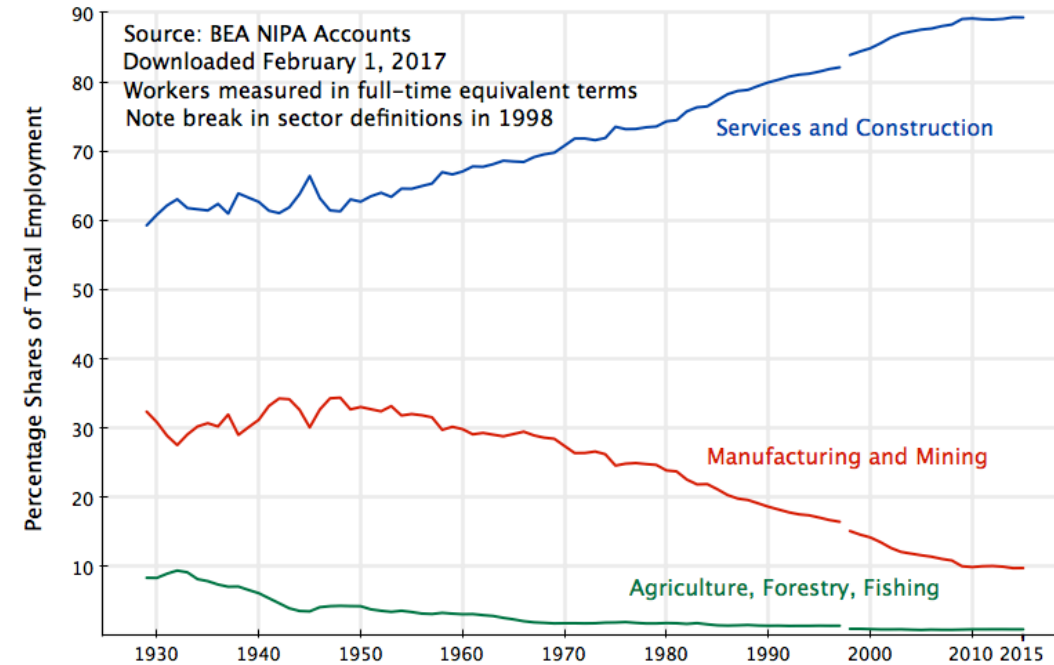Measured by Real Value–Added Per Worker; 1947 = 1.0

Chart 1: Sector Shares of Total Employment – 1929 to 2015
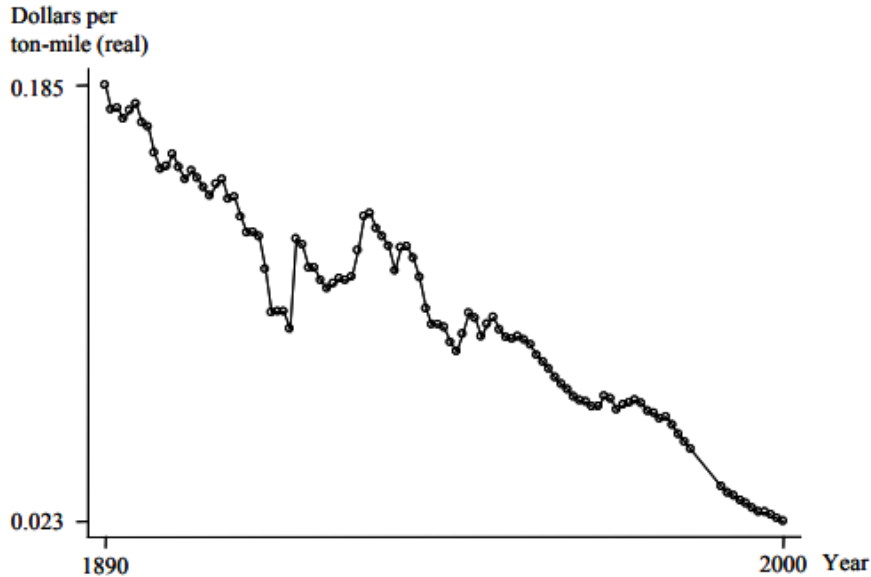
Declining freight costs

Sea freight cost (relative to 1930)

Passenger air transport cost (relative to 1930)

International calling costs (relative to 1930)

Source: Transaction Costs - OECD Economic Outlook (2007)

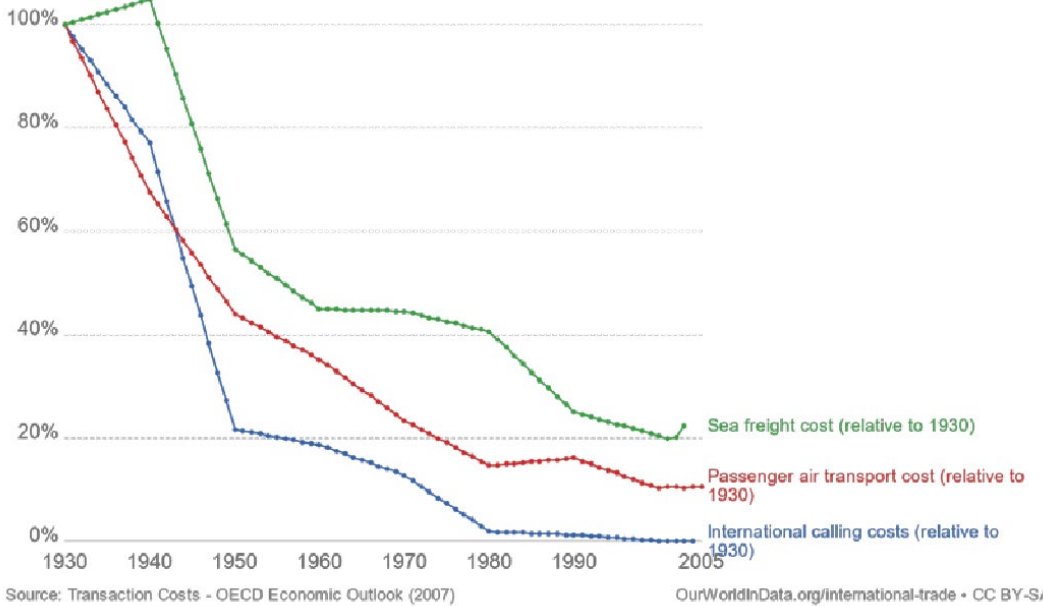OurWorldInData.org/international-trade • CC BY-SA

Fig. 3. The costs of railroad transportation over time
Source: Historical Statistics of the US (until 1970), 1994, Bureau of Transportation Statistics Annual Reports 1994 and 2002.
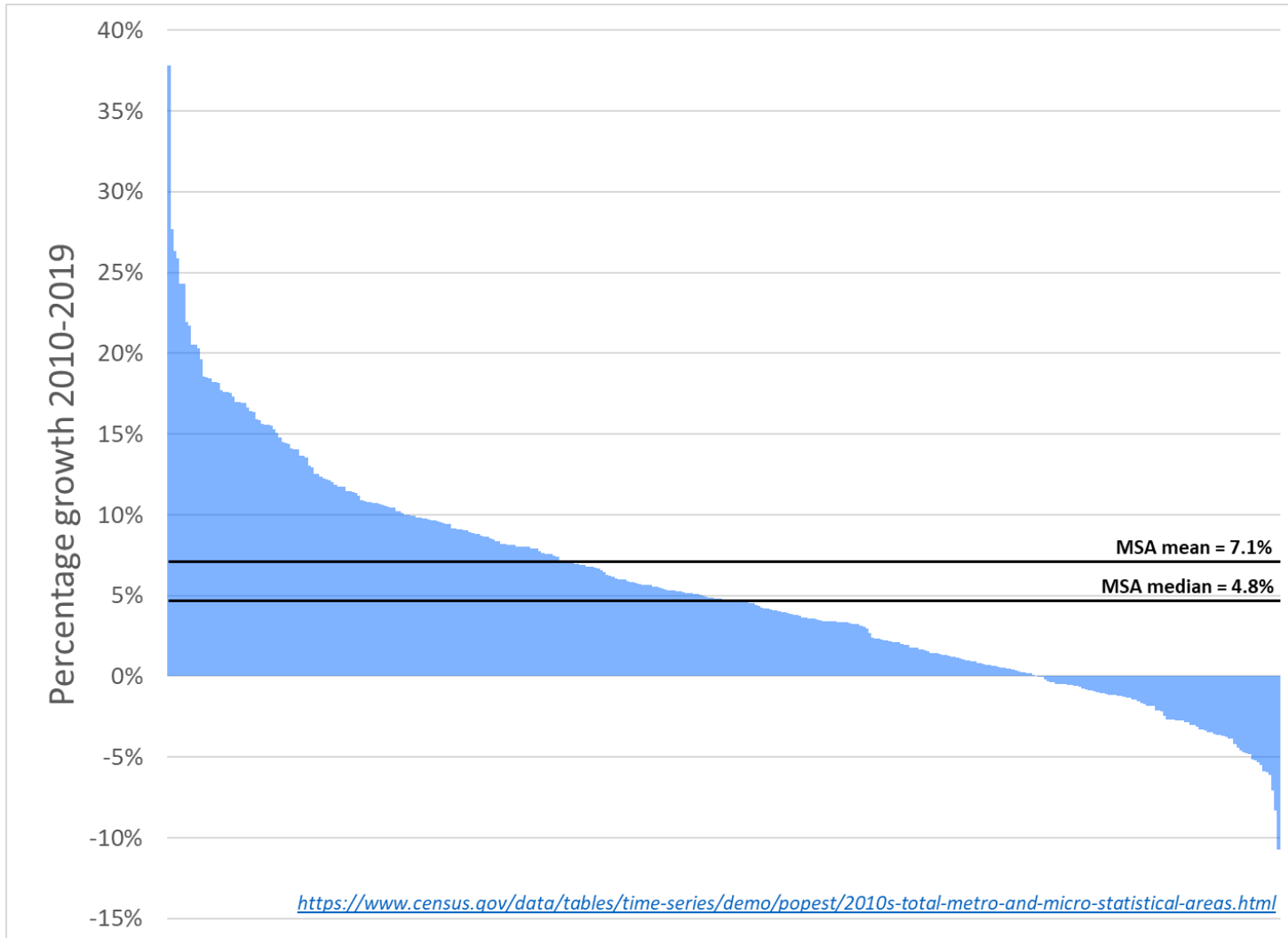
Around the world, cities are growing.

Why? Income growth. And? Industrial change.

Around the world, cities are growing.

Why? Income growth. And? Industrial change.

What else?

Urban growth is <u>not</u> ubiquitous

https://www.census.gov/data/tables/time-series/demo/popest/2010s-total-metro-and-micro-statistical-areas.html

While ~80% of MSAs in U.S. are growing, 20% are declining.

Mean > Median: The "average city" is growing less than average.

Range: Upper quartile of MSAs growing by more than ~1-2% p.a. while the lower quartile is barely growing at all.
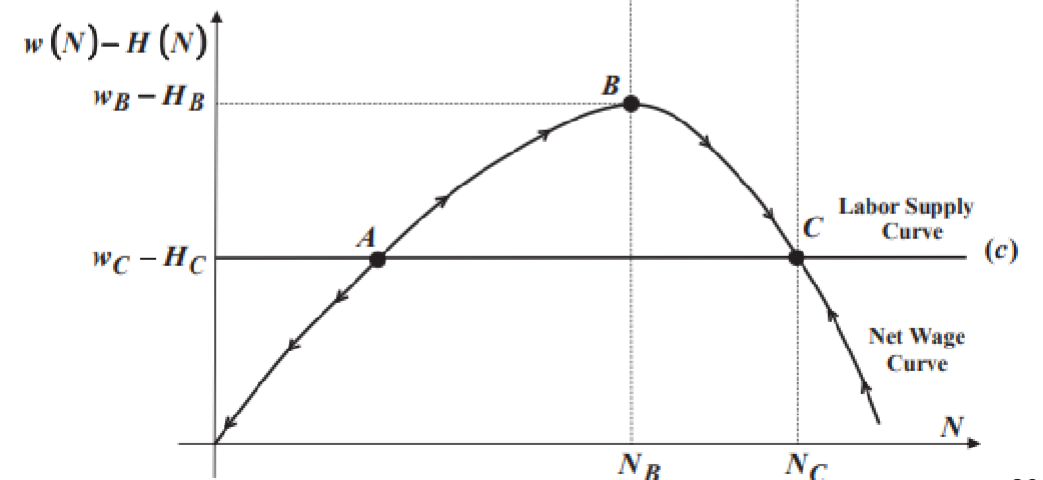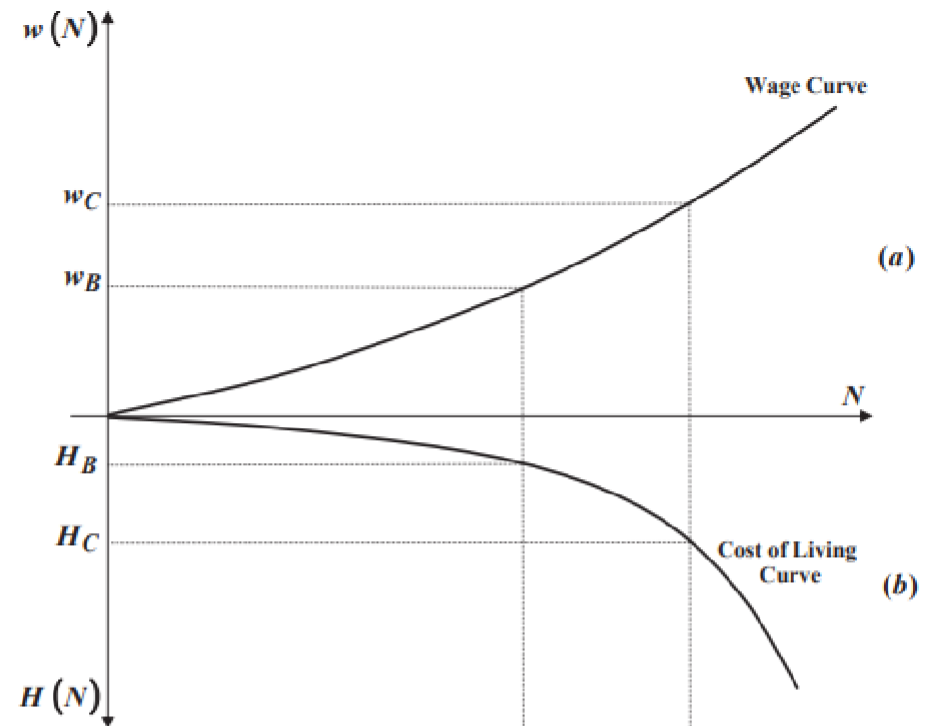
Idea: Cities reflect an interplay between the benefits of *agglomeration* and the costs of *congestion*.

Agglomeration & Congestion

Agglomeration economies describe the benefits of proximity.

Congestion costs arise when the utility of consumption declines with use, e.g. roads.

People migrate to cities as long as (private) agglomeration benefits > congestion costs.
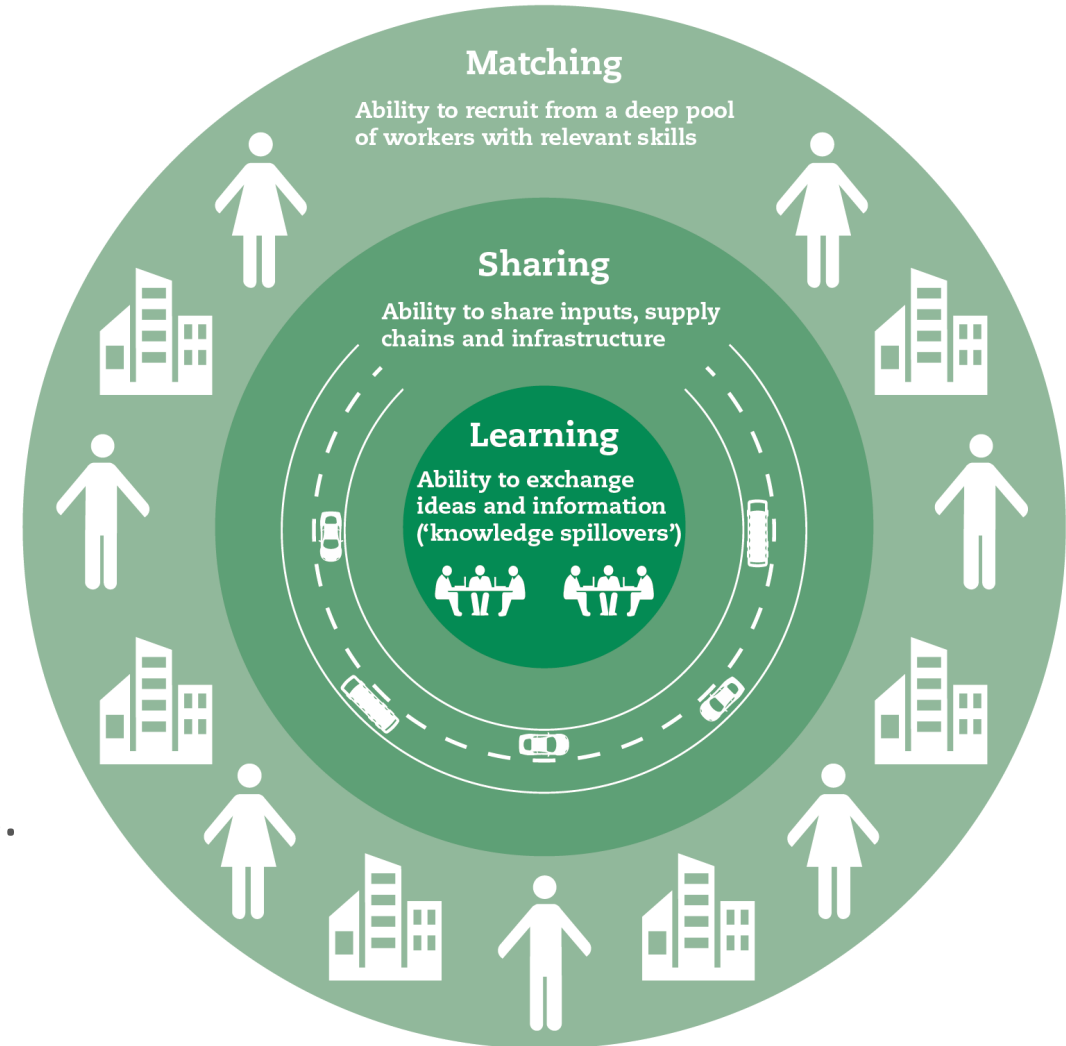
Agglomeration

Three main sources:

- Matching, e.g. labour force
- Sharing, e.g. infrastructure costs
- Learning, e.g. exchange ideas

Agglomeration economies are relatively heterogeneous, varying by sectors and skills.

Matching
Ability to recruit from a deep pool of workers with relevant skills

Sharing
Ability to share inputs, supply chains and infrastructure

Learning
Ability to exchange ideas and information ('knowledge spillovers')

Congestion

Affects many aspects of urban life:

- Transport
- Education
- Recreation

Congestion is a negative externality; often afflicts publicly-provided goods, where price signals are inefficient or non-existent.

Idea: Cities arise from an interplay between the opposing forces of agglomeration and congestion.

Implication: Cities that can leverage the benefits of agglomeration while managing the costs of congestion are more likely to prosper.

Around the world, cities are growing.

Why? Income growth. And? Industrial change.

What else? Agglomeration vis-à-vis congestion.

Is that it?

Idea: Differences between cities reflect differences in the availability of local amenities.

What do we mean by local "amenities"?

- Local amenities are attributes of a location

- Proximity is necessary to enjoy the amenity

- Amenities can be:

    - *Natural*, e.g. climate and physical geography

    - *Socioeconomic*, e.g. infrastructure and institutions

- For households, amenities might include safety, air quality, parks, and schools ...

- For firms, amenities might include skilled workforce and international airport ...
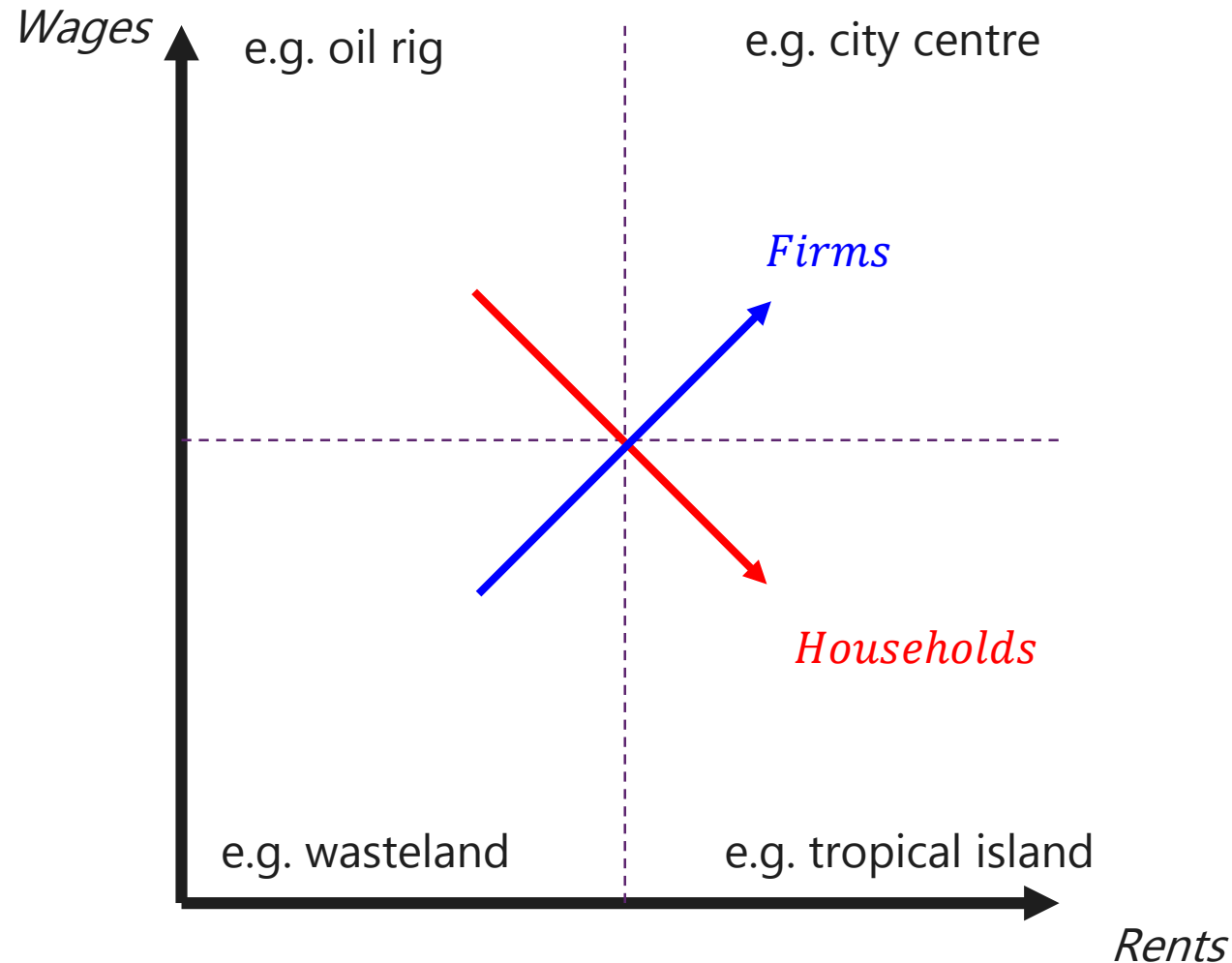
How might we estimate the value of amenities?

The Rosen-Roback model (RRM) is a key model in spatial economics.

- Assumes households and firms choose locations

- Considers interaction between prices (e.g. wages and rents) and "amenities"

- Low prices act as compensation for low levels of amenities, and vice versa

Key point: All households / firms in all locations achieve the same utility / profits.

Rosen-Roback model: In a "nutshell" (graph)

A graph with Wages on the vertical axis and Rents on the horizontal axis. Quadrant labels: top-left "e.g. oil rig", top-right "e.g. city centre", bottom-left "e.g. wasteland", bottom-right "e.g. tropical island". A blue upward-sloping line labelled "Firms" and a red downward-sloping line labelled "Households" cross near the centre.

For households, high rents indicate high amenities (e.g. resort). High wages, on the other hand, indicate you need to pay people a lot to stay put (e.g. oil rig).

For firms, high rents and high wages indicate the presence of productivity-enhancing amenities that enable firms to spend more yet remain competitive.
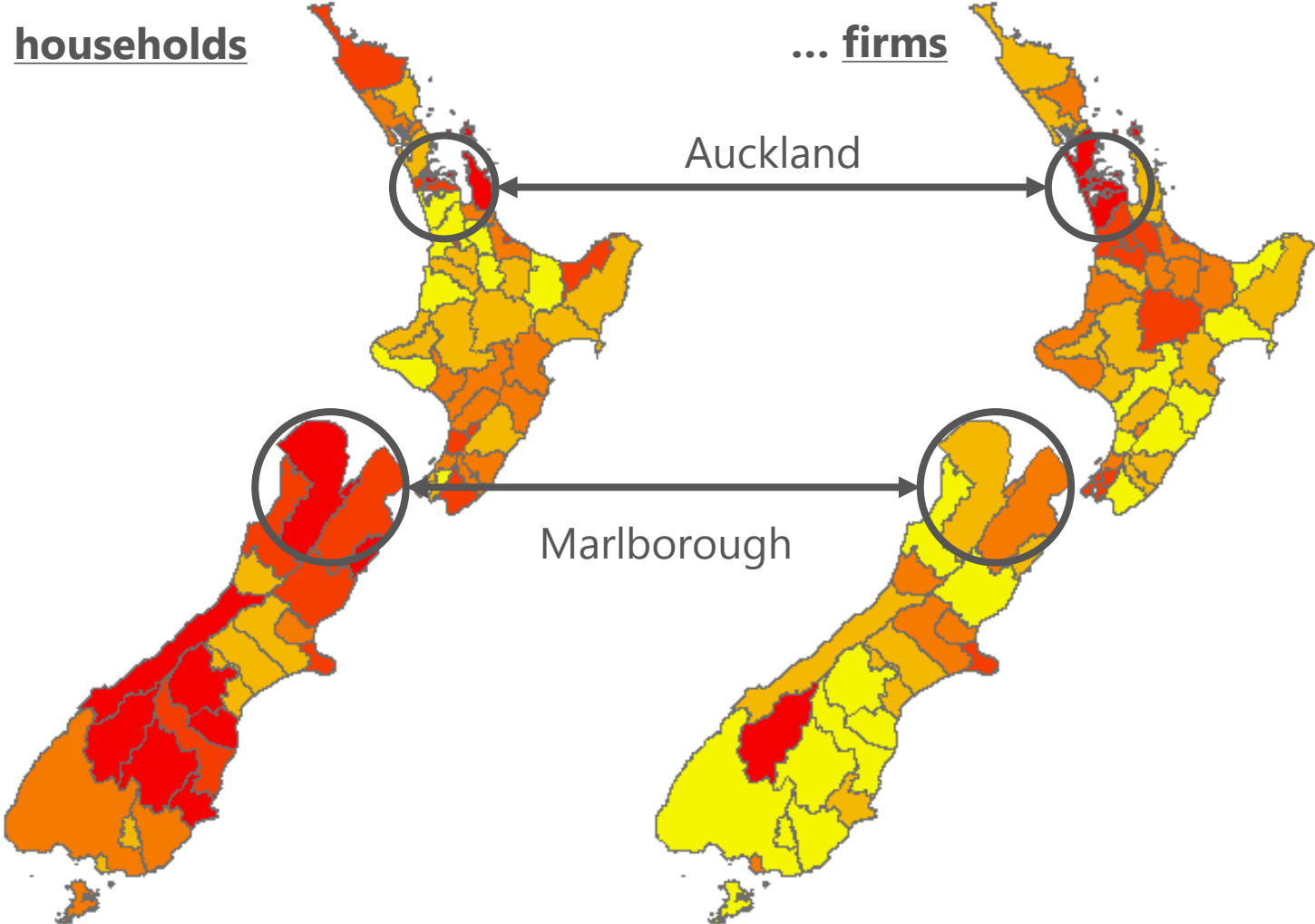
Rosen-Roback model: Empirical evidence

Value of local amenities for …

... <u>households</u>

... <u>firms</u>

Auckland

Marlborough

Source: Donovan, S. Space matters: Agglomeration economies and spatial competition in New Zealand, (Unpublished master's thesis). VU University, Amsterdam, Netherlands, 2011

Rosen-Roback model: Empirical evidence
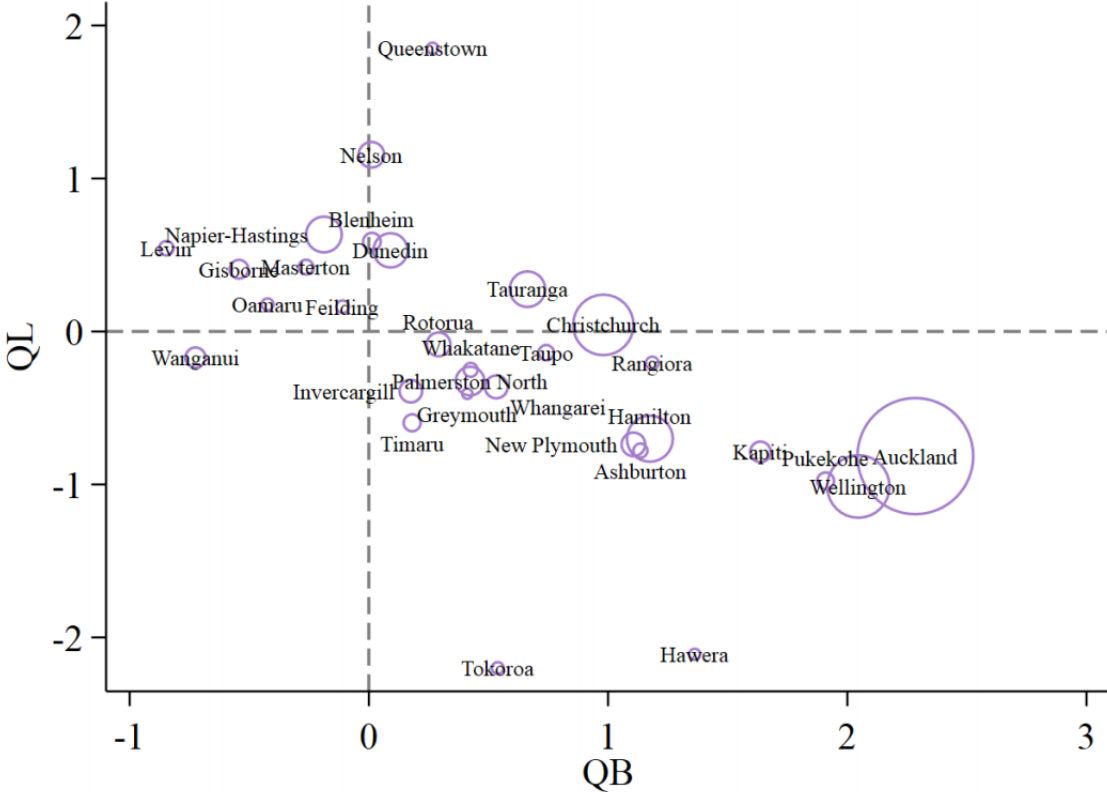

Figure 1: Wage and Rent Premia (2013)

Figure 2: QL and QB (2013)

Around the world, cities are growing.

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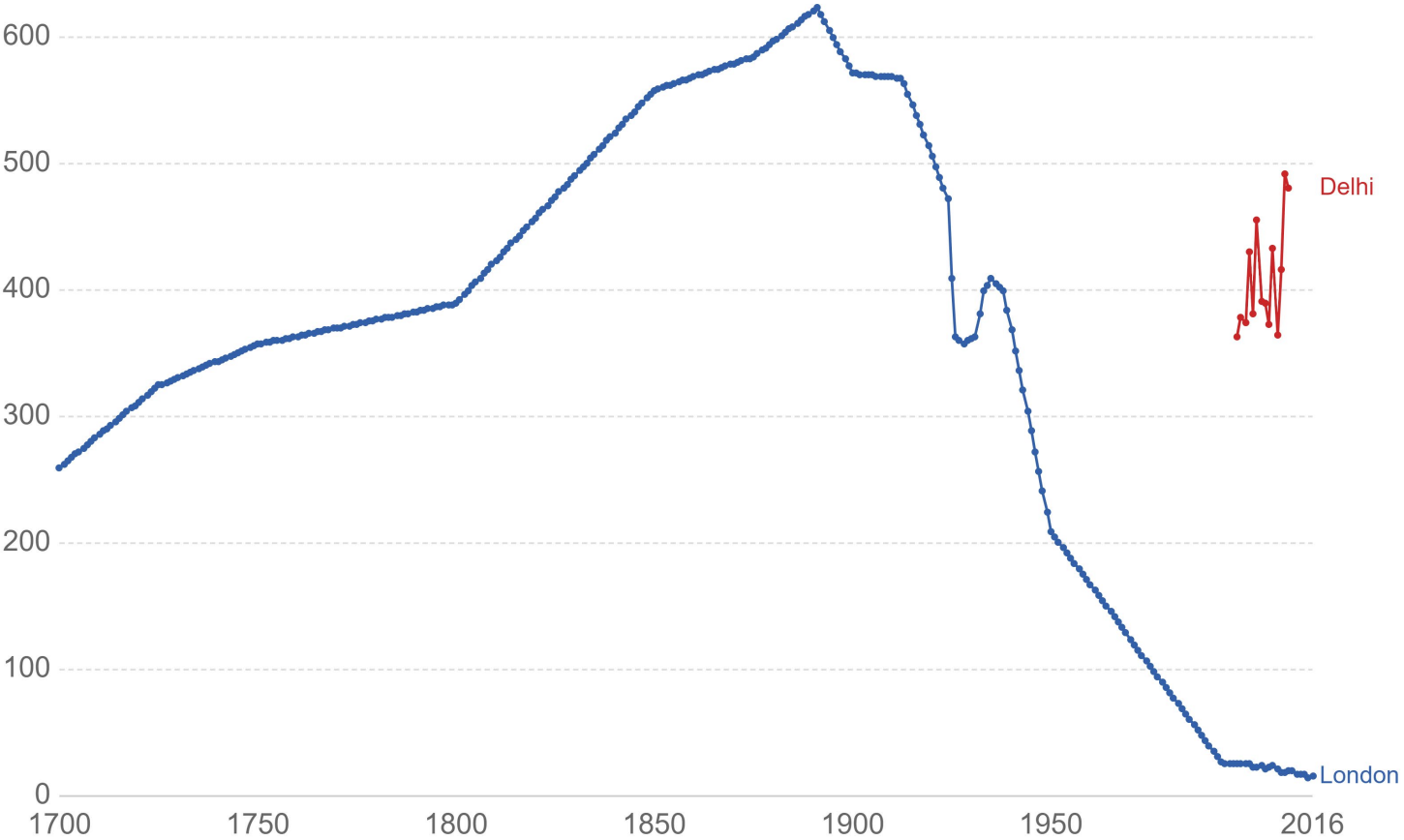What else? Agglomeration vis-à-vis congestion.

Is that it? The role of amenities.

Idea: Changes in technology and policy are enhancing urban amenity and supporting growth.

Example #1: Air pollution

Air pollution, London vs. Delhi

Average concentrations of suspended particulate matter (SPM), measured in micrograms per cubic metres in London over the long-term and Delhi's more recent past.
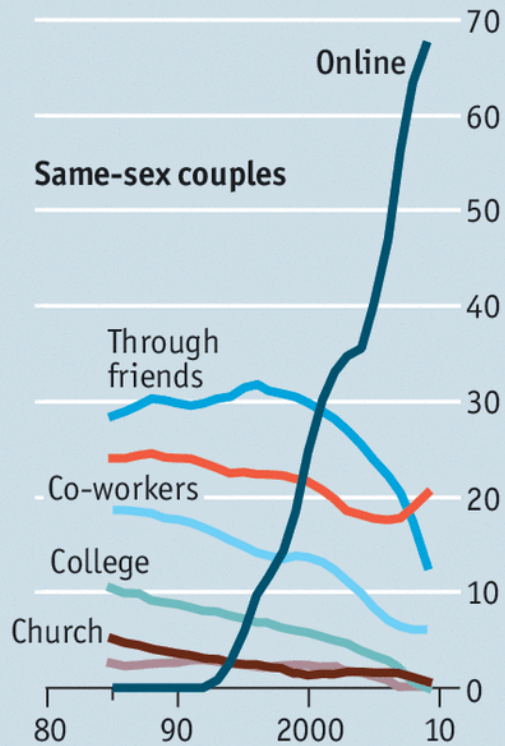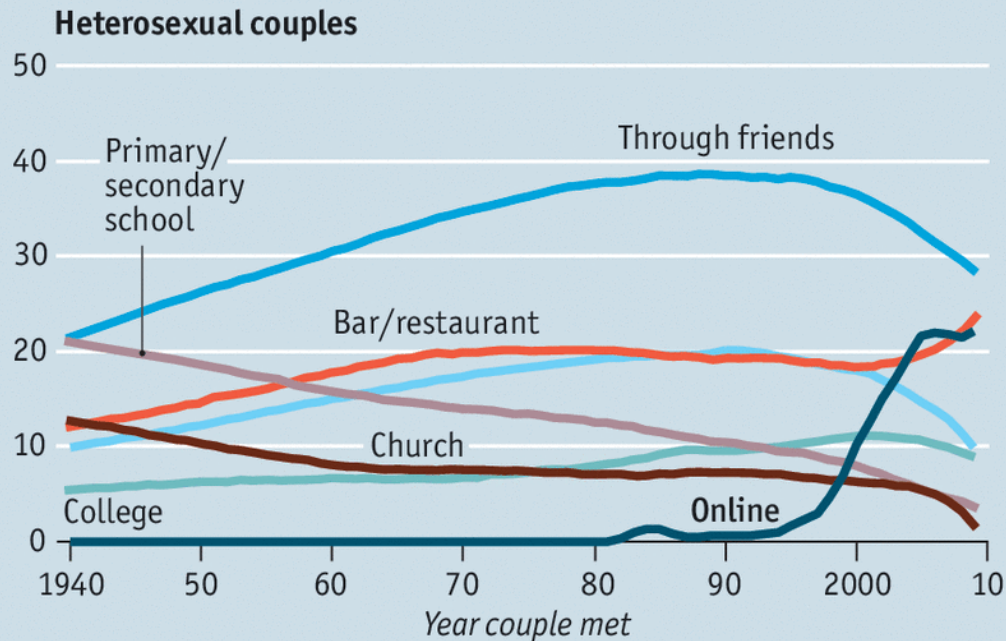
Source: Fouquet (2011) and Government of India (2012-13)

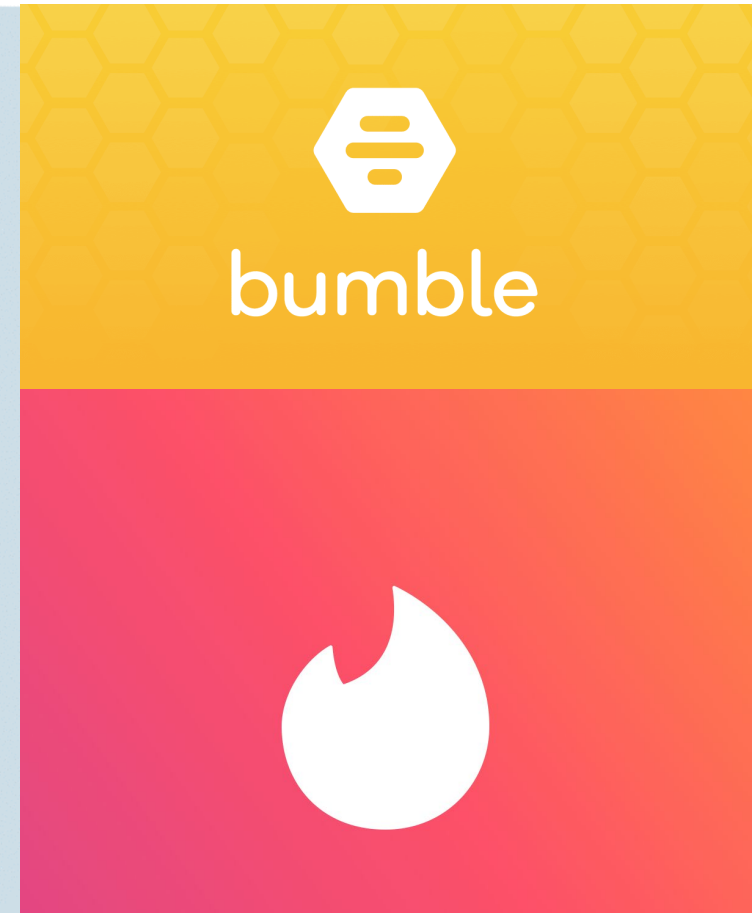OurWorldInData.org/london-air-pollution/ • CC BY

Example #2: Relationships?

Meet market
United States, how couples meet, %

Heterosexual couples

Primary/secondary school

Through friends

Bar/restaurant

Church

College

Online

Same-sex couples

Online

Through friends

Co-workers

College

Church

Year couple met

Source: "Searching for a Mate: The Rise of the Internet as a Social Intermediary", by Michael J. Rosenfeld and Reuben J. Thomas

The Economist

bumble

vlc

Our research

- We adapt the Rosen-Roback model to a dynamic setting

- Consider the location choices of households and the production choices of firms

- Incorporate agglomeration economies in production *and* consumption

- Households to differ by skill level (measured by education)

Estimate model using census data for ~130 cities and towns in New Zealand over ~40-years (8 census waves). Allows us to analyse effects *between cities* and *over time*.

Preliminary findings

- Amenities matter to households. Like, really matter.

- Climate explains ~25% of the variation in amenities. Top of the South Island has the most valued climate in New Zealand. Of the major cities, Tauranga and Auckland have the best climates.

- Artificially raising rents leads to lower wages. Policies that restrict urban development, e.g. density controls, squeeze workers on two fronts: Higher housing costs and lower wages.

- Housing supply affected by adjustment frictions ("sticky quantities")

- Urban development has positive regional spillovers

- Strong positive agglomeration economies:

  - In production, especially for high-skilled workers

  - In consumption, for both high and low skilled

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National SCIENCE Challenges

What does this mean for Auckland?

What does this mean for Auckland?

- The industrial city is dead

What does this mean for Auckland?

- The old industrial city is dead
- Enable agglomeration; manage congestion

What does this mean for Auckland?

- The old industrial city is dead
- Enable agglomeration; manage congestion
- Understand what it means to be an "amenable" city

The Amenable City: Delivers a bundle of amenities that are valued by both households and firms.

Acknowledges the challenges created by imperfect (or non-existent pricing) and variation in preferences.

Accepts "mega-trends", e.g. technology and climate change, and instead focuses on policies that are dynamically efficient. That is, let's do better over time.

Main Themes

- Growing cities. Why?

    - Income and Industry

    - Agglomeration and Congestion

    - Prices and Amenities

    - Adjustment Dynamics

- Implications for Auckland

Acknowledgements

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- Our hosts, Te Pūnaha Matatini ([url](url))

THANK YOU