

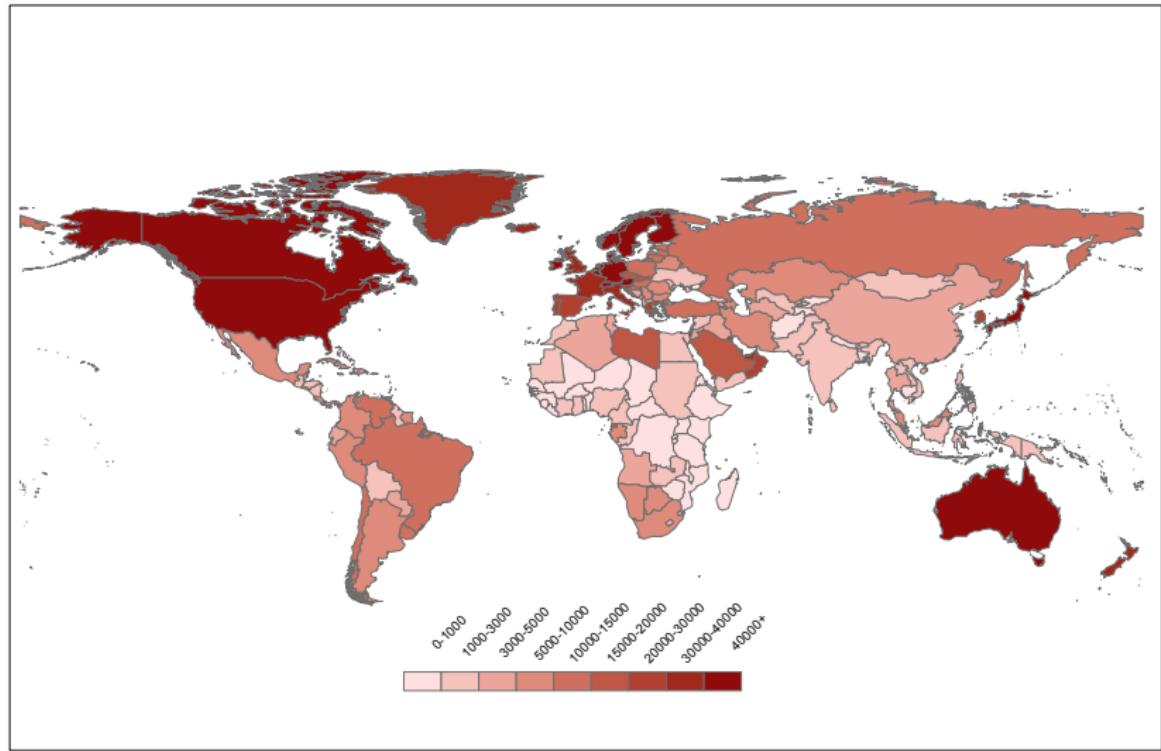
# Growth and Comparative Development: An Overview

Ömer Özak

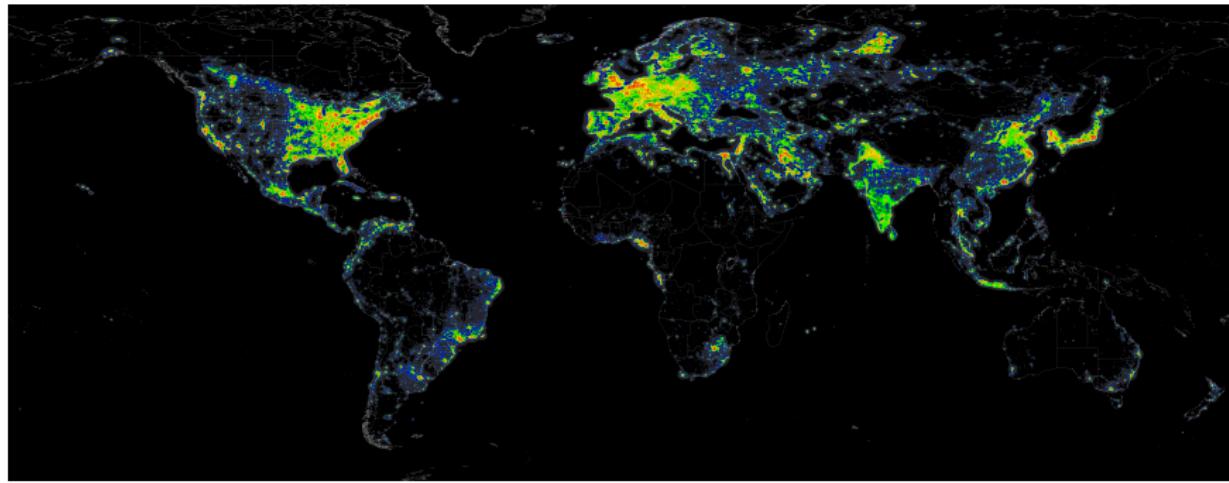
Department of Economics  
Southern Methodist University

Economic Growth and Comparative Development

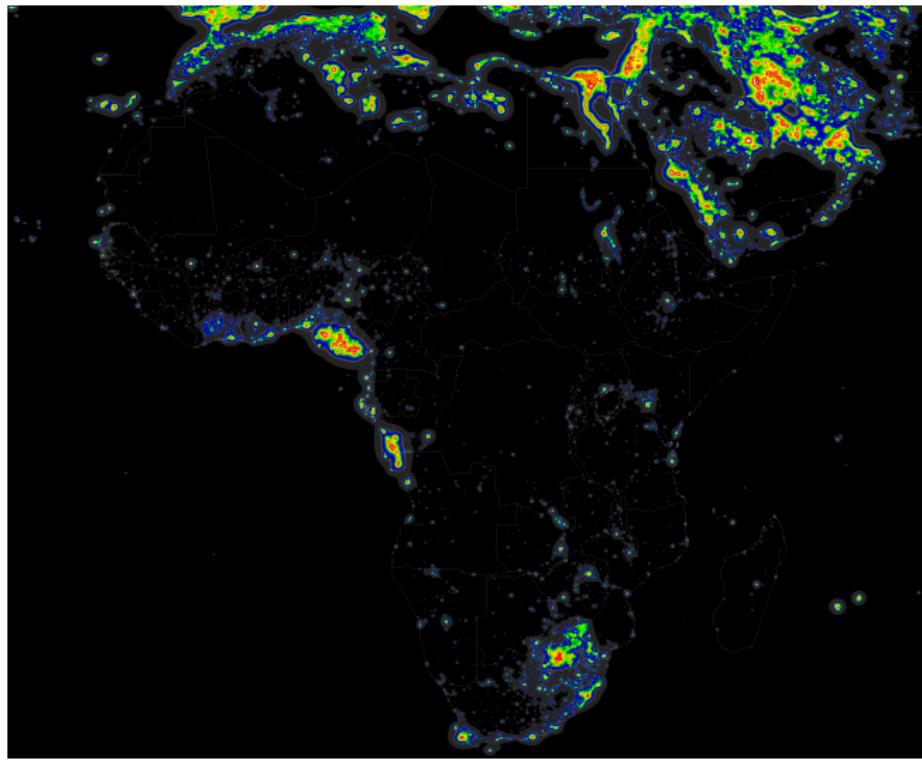
## Income per Capita across the Globe in 2010



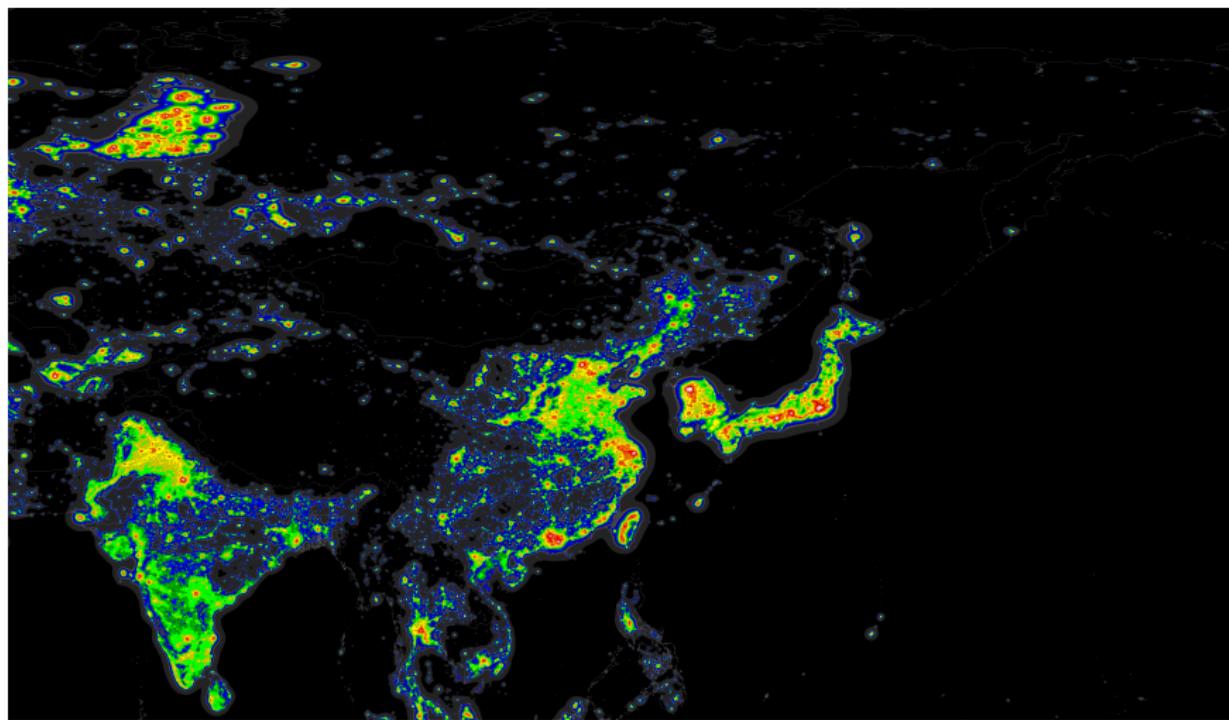
# Night Lights across the Globe in 2016



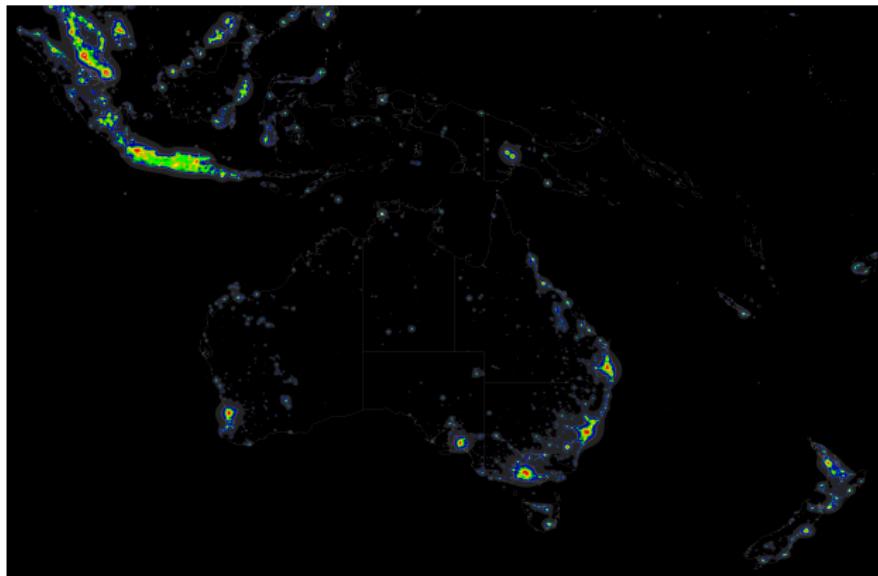
## Night Lights across Regions – Africa



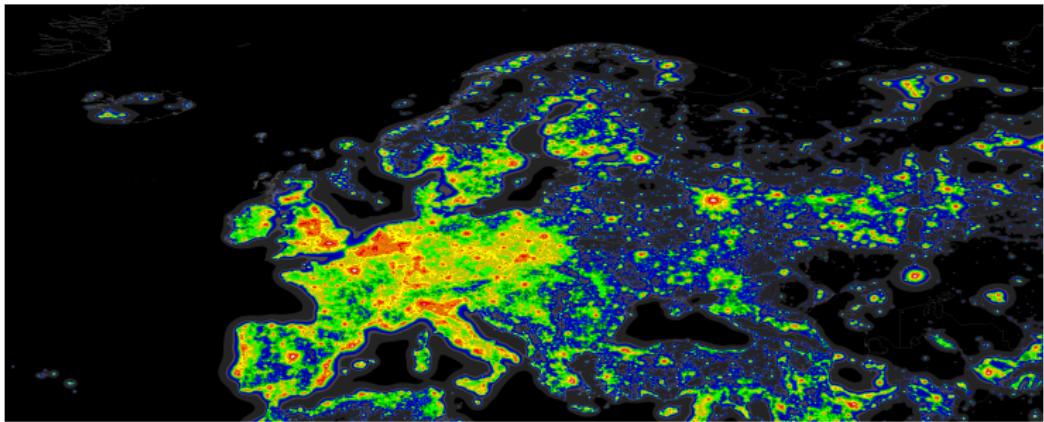
## Night Lights across Regions – Asia



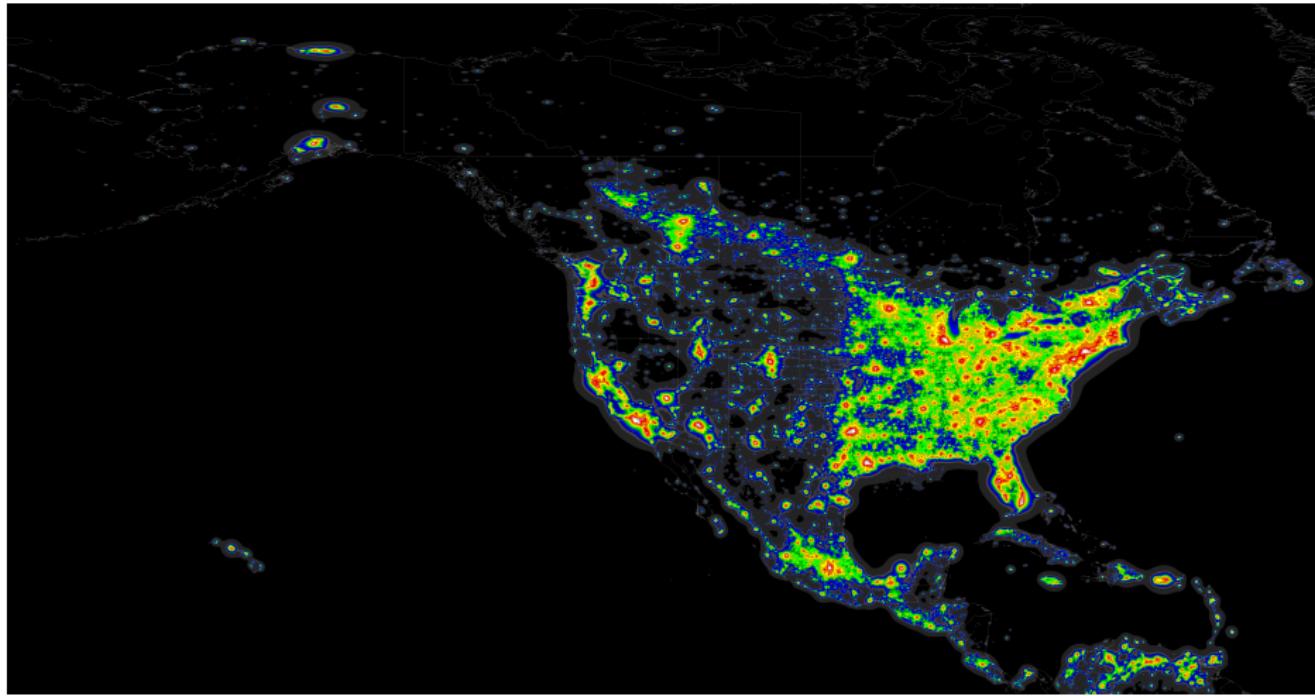
## Night Lights across Regions – Australia



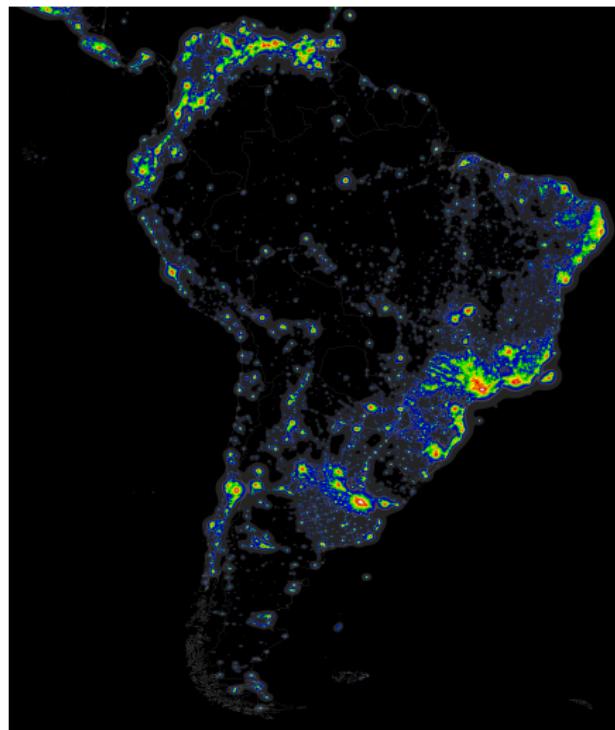
## Night Lights across Regions – Europe



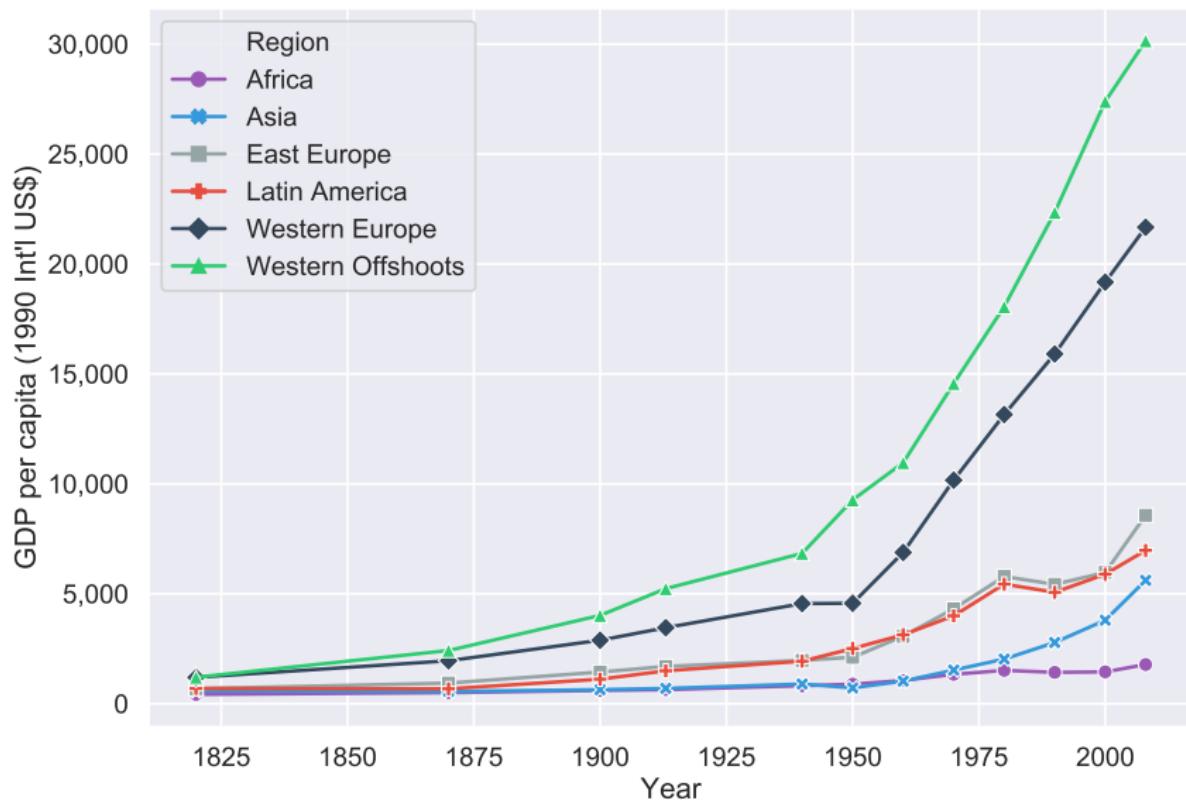
## Night Lights across Regions – North America



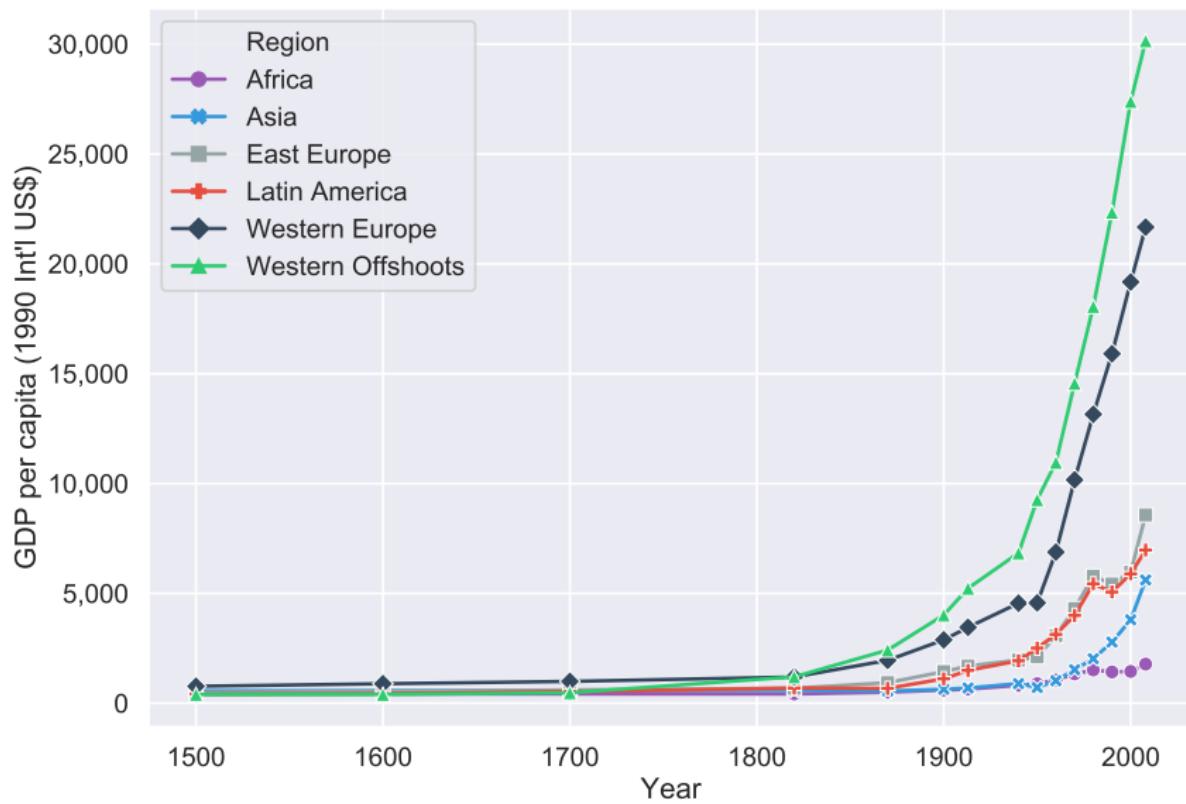
## Night Lights across Regions – South America



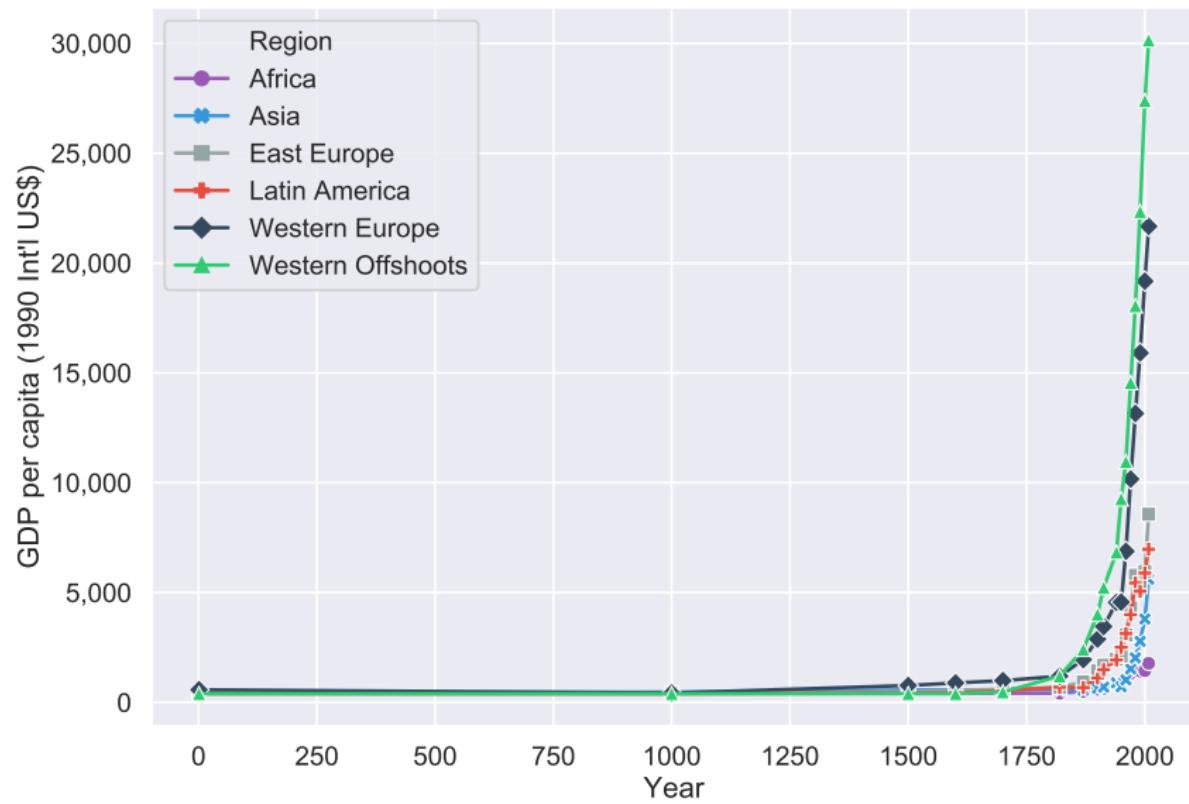
## Divergence across Regions: 1820–2010



## Divergence across Regions: 1500–2010



## Regional Income per Capita: 1–2010

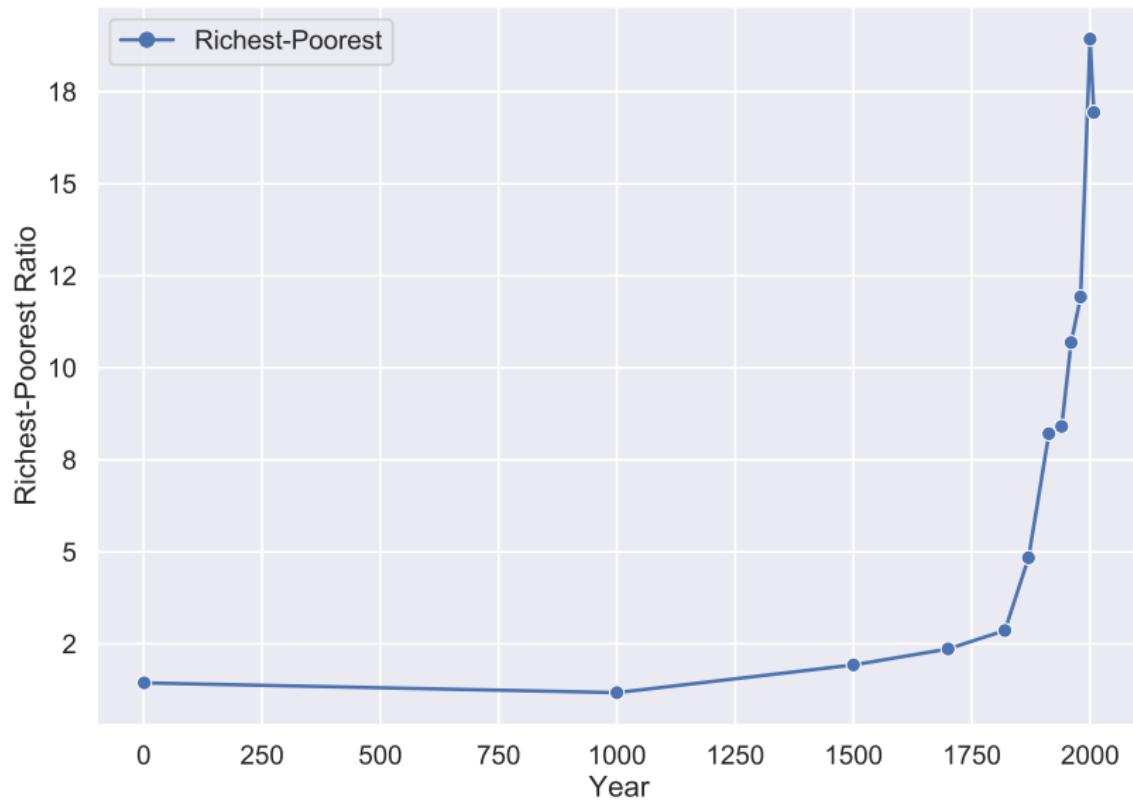


## Evolution of Inequality across Regions: 1–2010

	Income per Capita (1990 Int'l \$)				
	1	1000	1500	1820	2010
Western Offshoots	400	400	400	1,302	29,564
Western Europe	576	427	771	1,455	20,889
Latin America	400	400	416	628	6,767
Asia	456	470	568	591	6,307
Africa	472	425	414	486	2,034
Richest-Poorest Ratio	1.4	1.2	2	3	15

Western Offshoots: USA, Canada, Australia, New Zealand.

## Evolution of Inequality across Regions: 1–2010



## Inferences from Growth Theory

- Diminishing returns to physical and human capital accumulation
- Diminishing effect of technological progress on productivity
  - $\rightarrow$  Reduction in inequality
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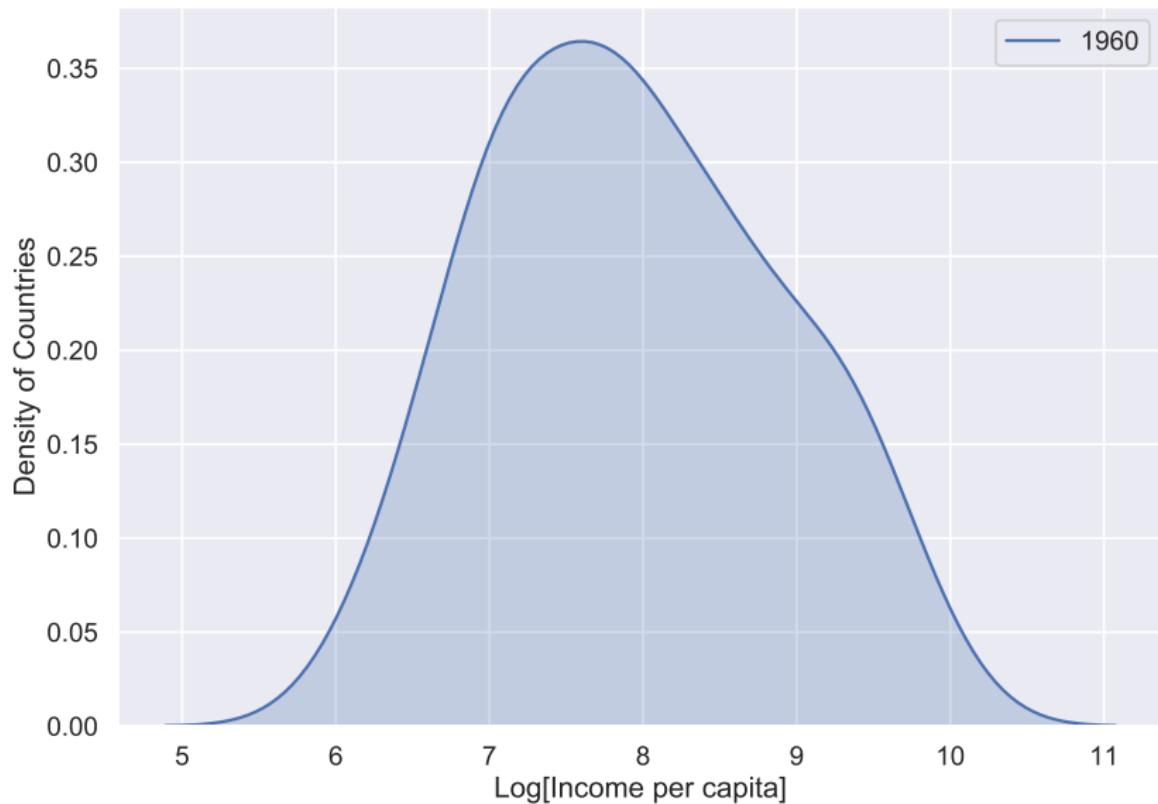
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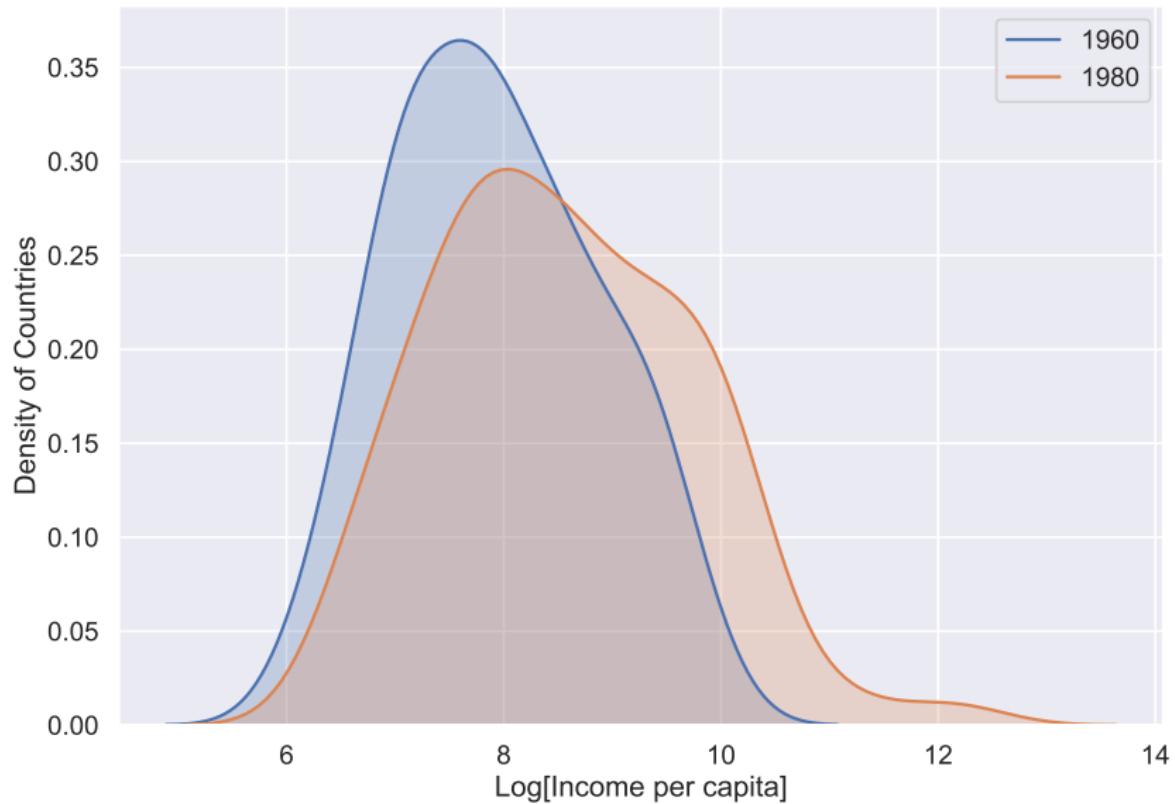
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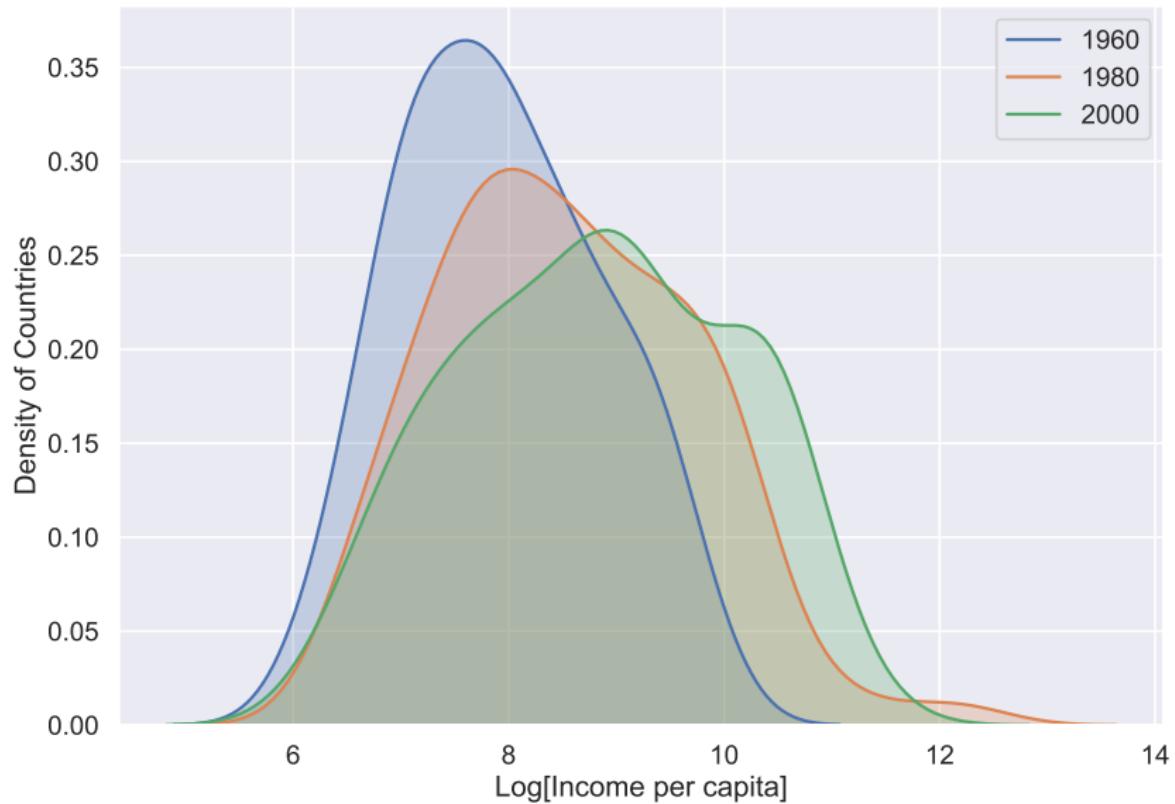
## Income Distribution in 1960



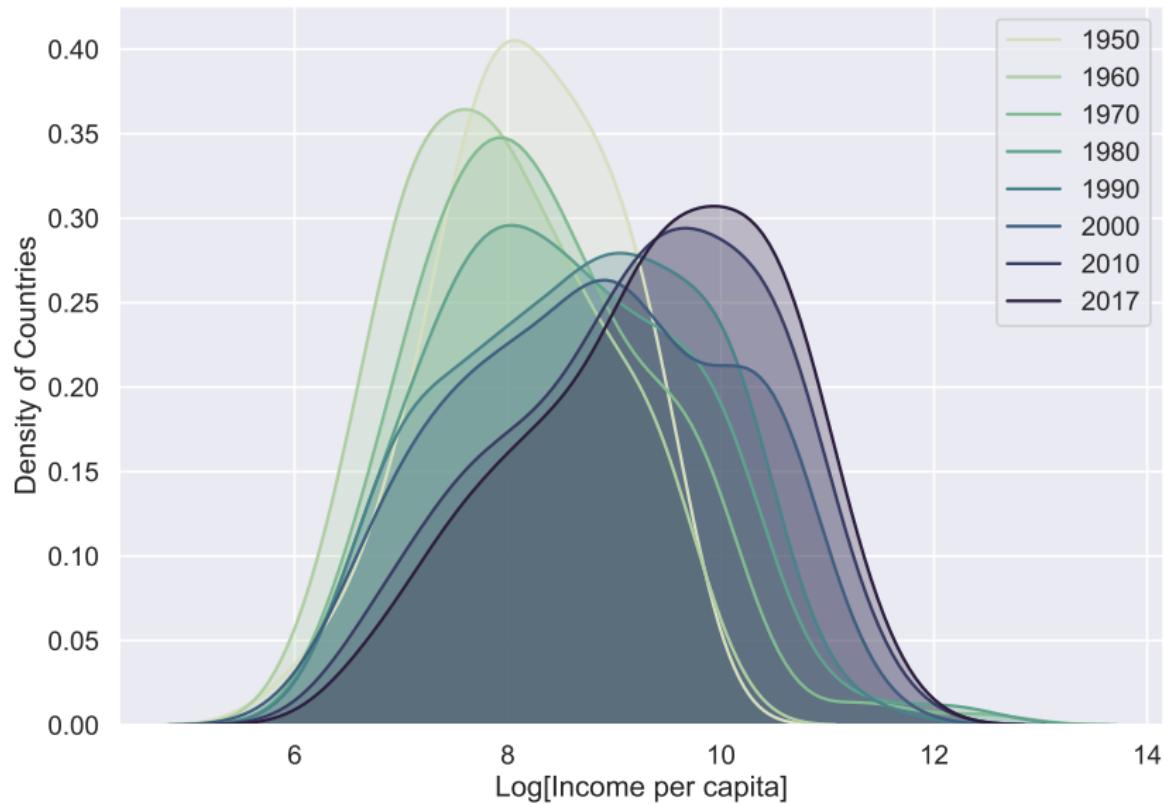
## Lack of Convergence across Nations: 1960–1980



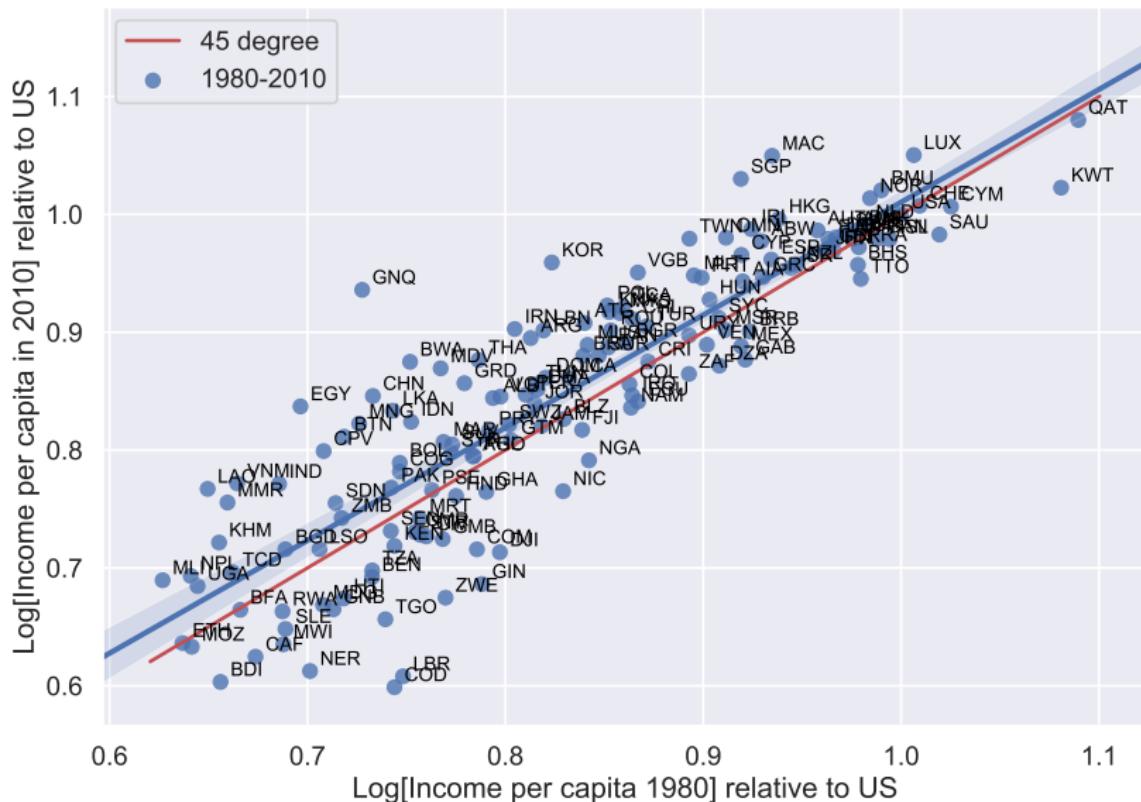
## Lack of Convergence across Nations: 1960–2000



## Lack of Convergence across Nations: 1950–2017



# Persistent Inequality across Nations: 1980–2010



## Fundamental Research Questions

- What is the origin of the vast inequality in income per capita across countries and regions?
- What accounts for the divergence in per-capita income across countries in the past two centuries?
- What are the factors that inhibited the convergence of poor economies toward richer ones in the past decades?
- What is the role of deep-rooted factors in explaining the observed patterns of comparative development?

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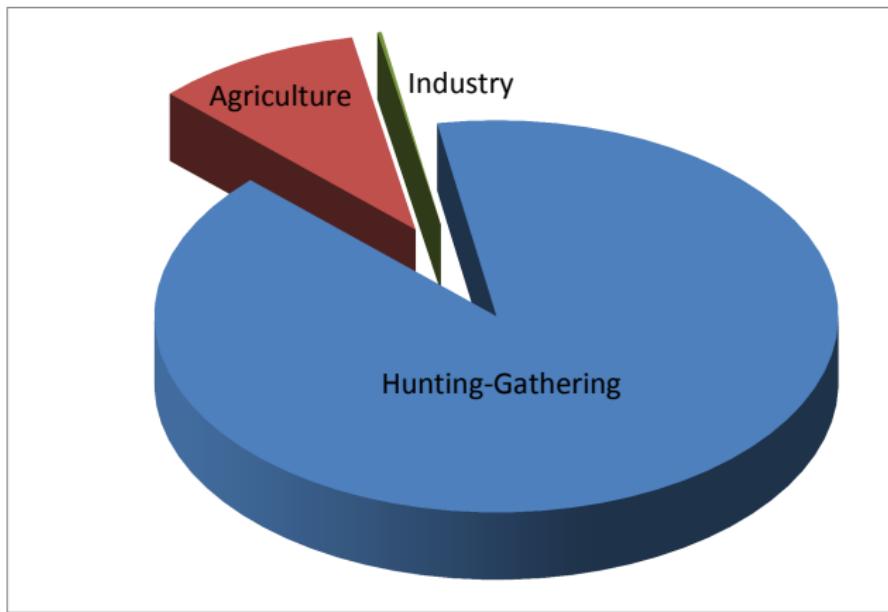
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## Phases of Development: Modes of Production



## Phases of Development: Standard of Living

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- The Post-Malthusian Regime
- The Modern Growth Regime

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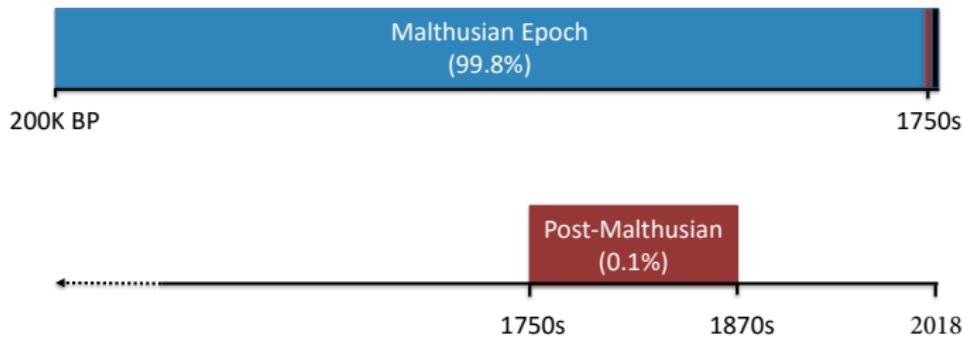
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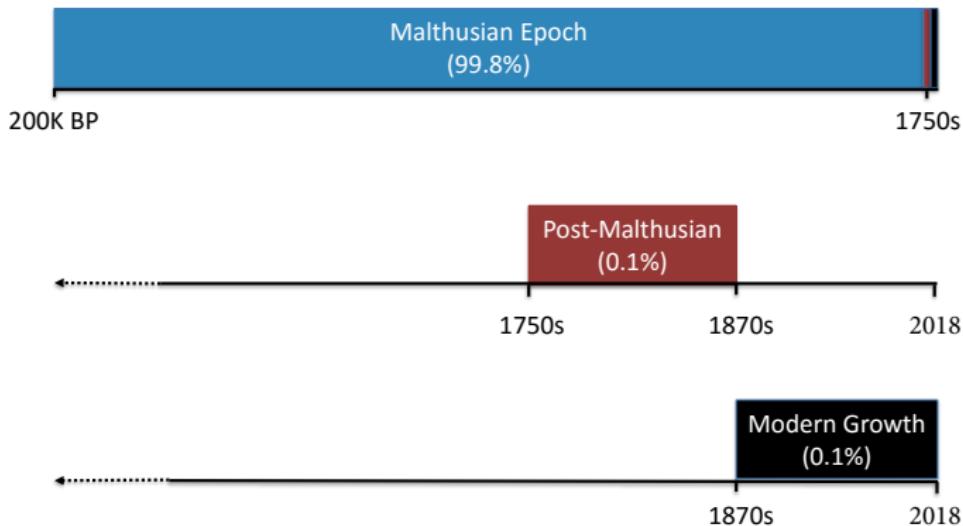
# Phases of Development: Timeline of the Most Developed Economies



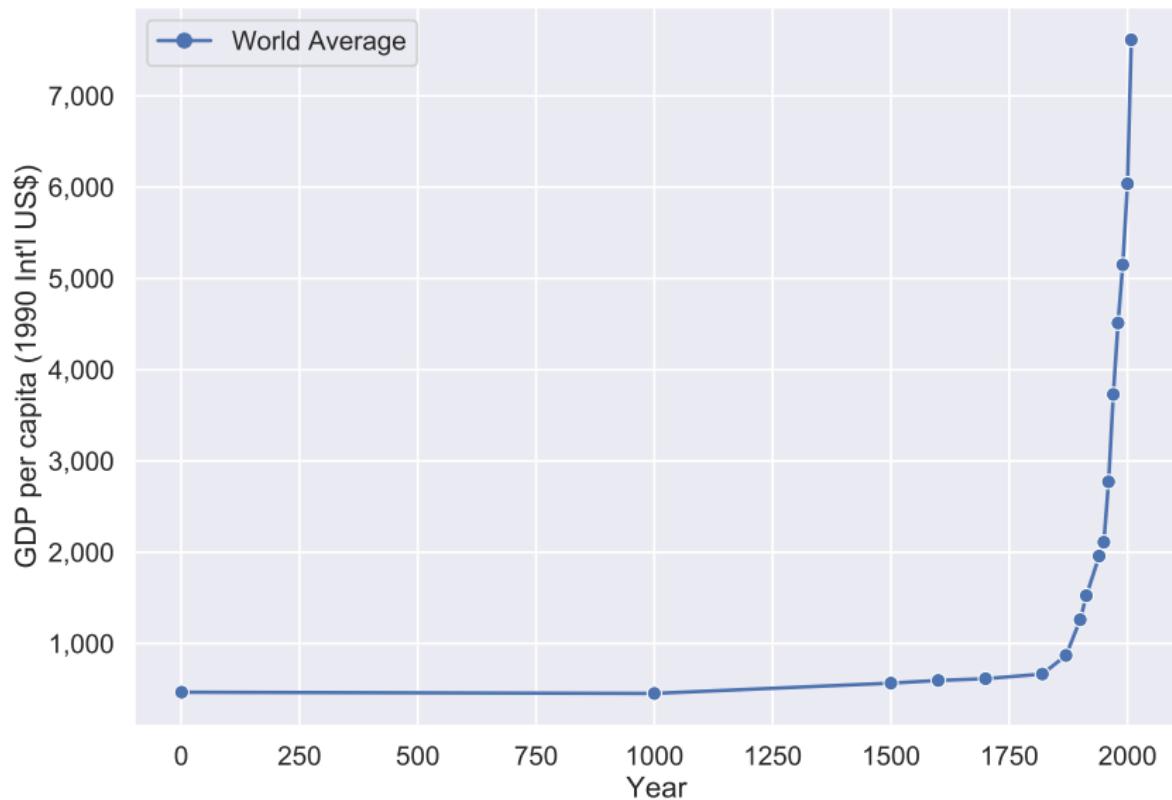
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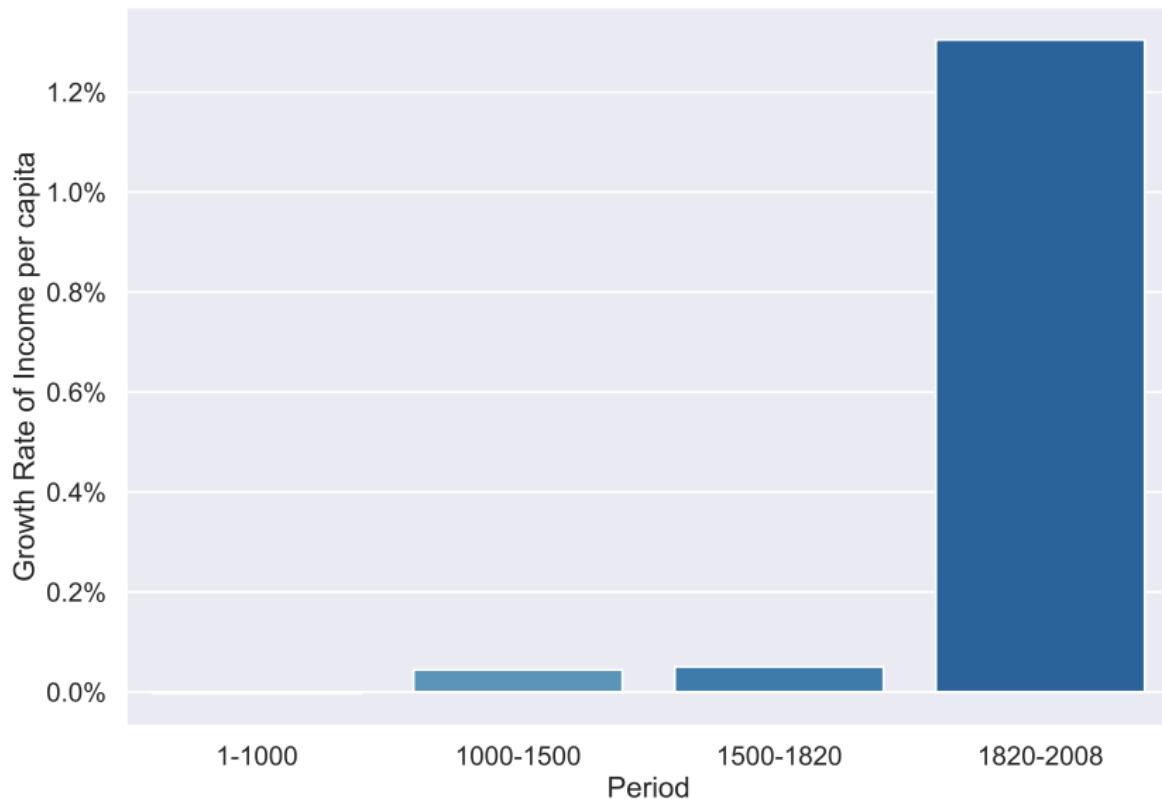
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## World Income per Capita: 1–2010



## Growth of World Income per Capita: 1–2010



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- Technological progress over this period
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  - Population adjust, as long as income remains above subsistence
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- Technologically advanced & land-rich economies:
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## Malthusian Dynamics - Prominent Examples

- The dynamics of Irish economy (1650 - 1850)
  - Triggered by the cultivation of a new world crop – potato
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    - Population increases from 2 to 6 million
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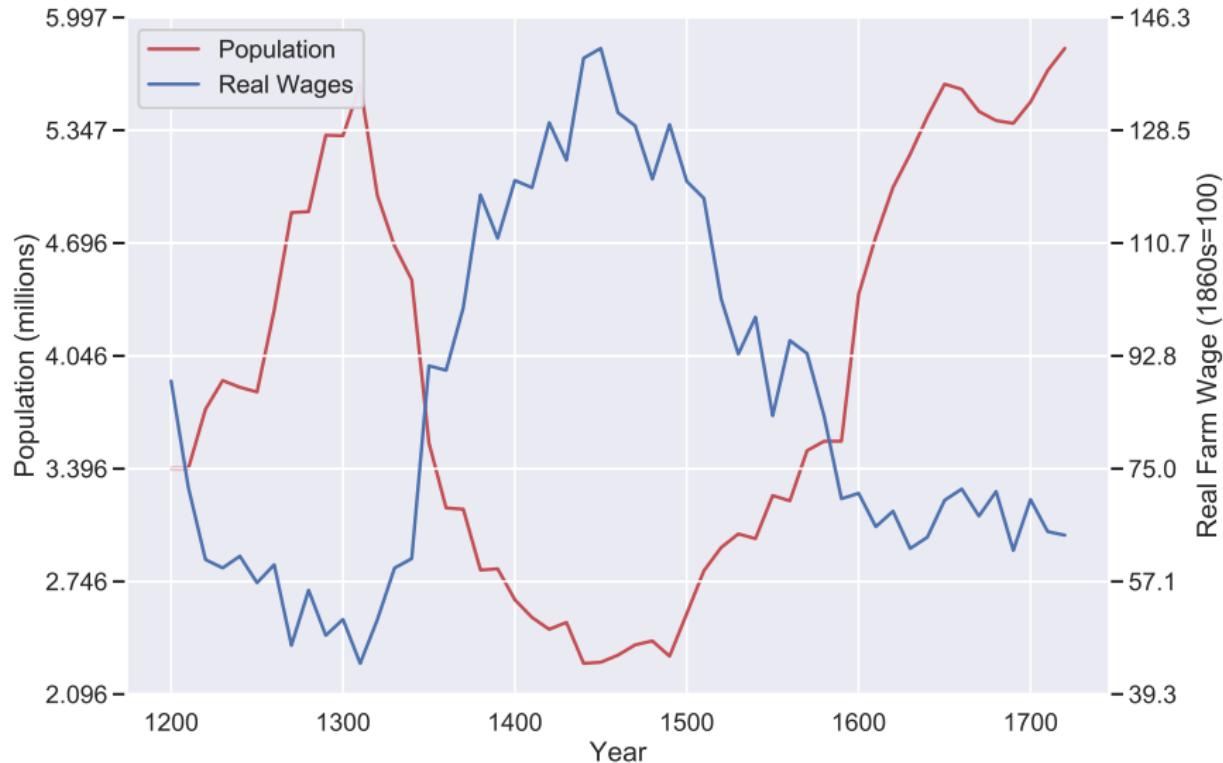
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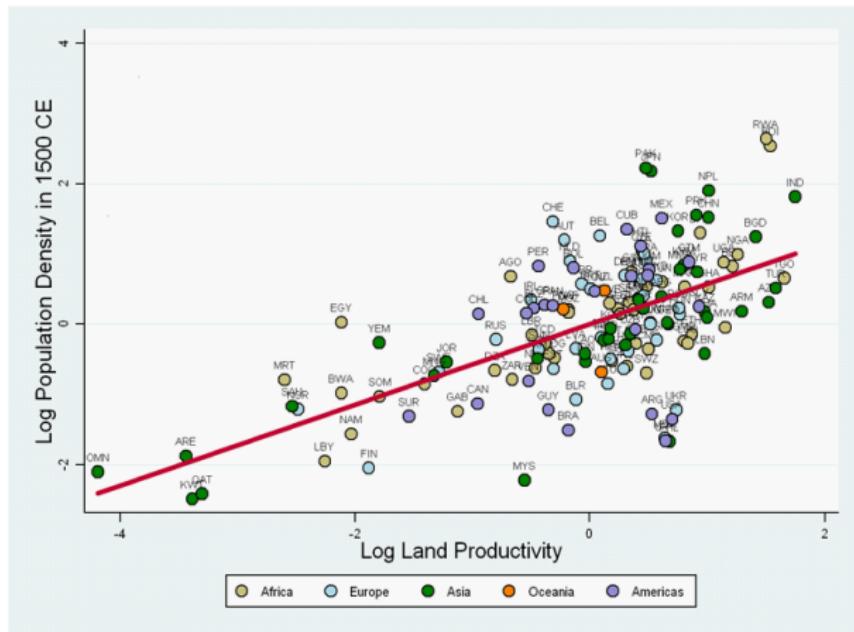
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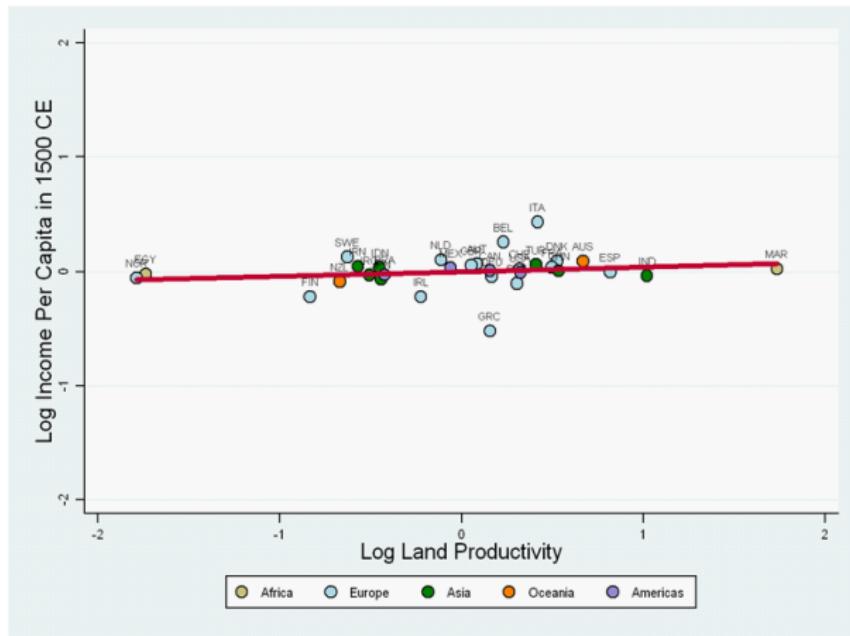
## Malthusian Adjustments to the Black Death: England, 1348–1750



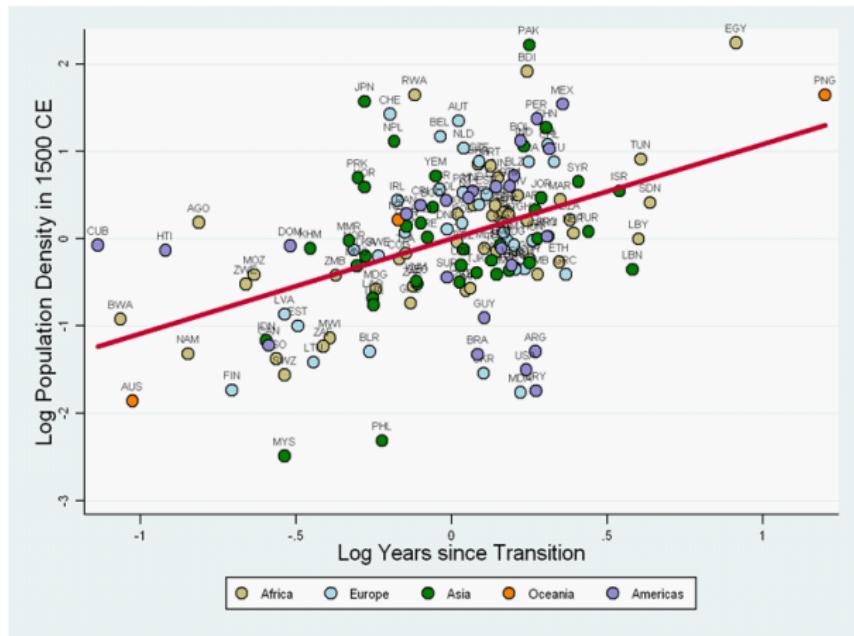
# Land Productivity and Population Density in 1500



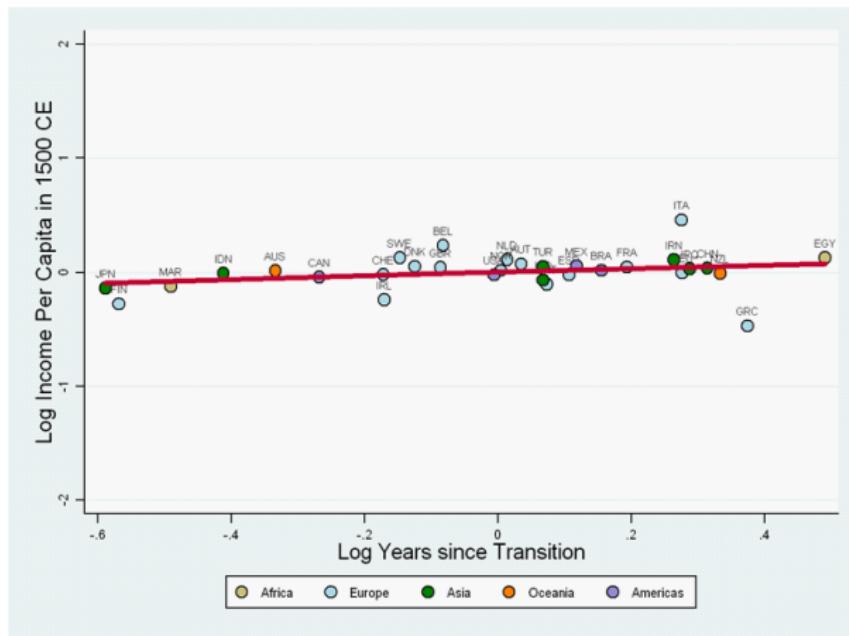
# Land Productivity and Income per Capita in 1500



## Technology and Population Density in 1500



## Technology and Income per Capita in 1500



## The Post-Malthusian Regime

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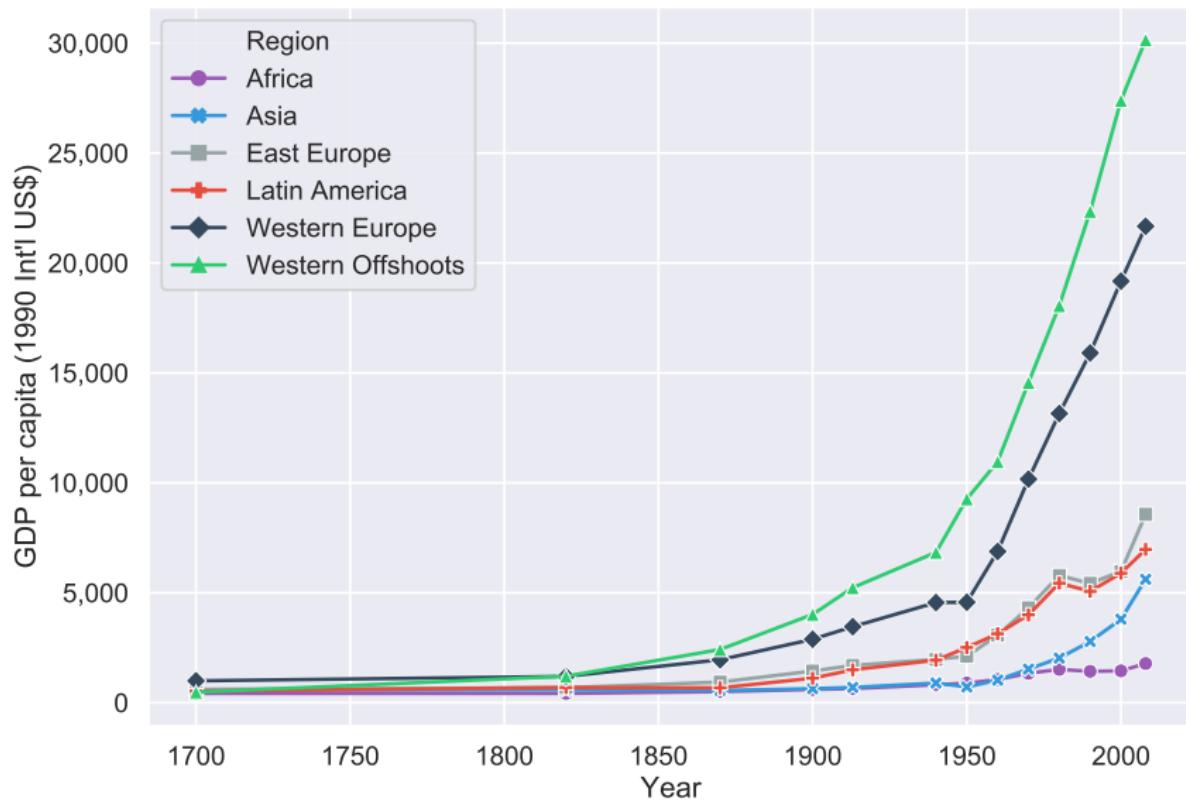
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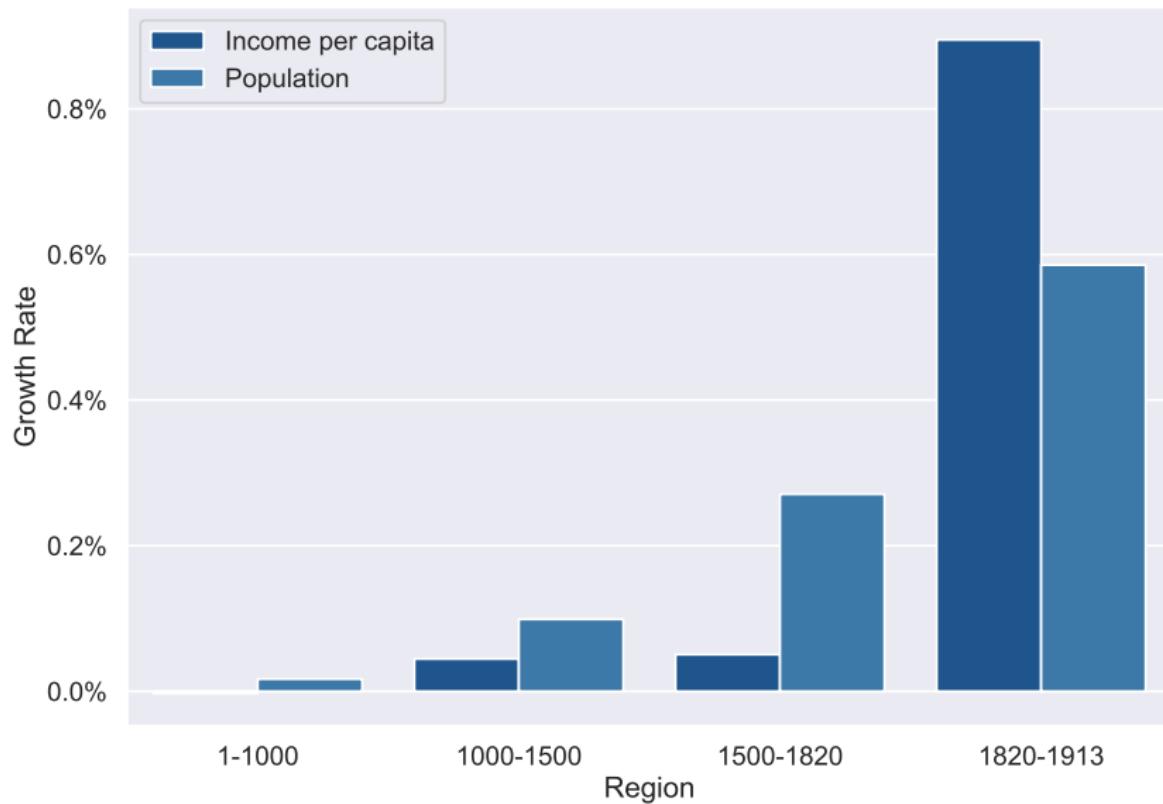
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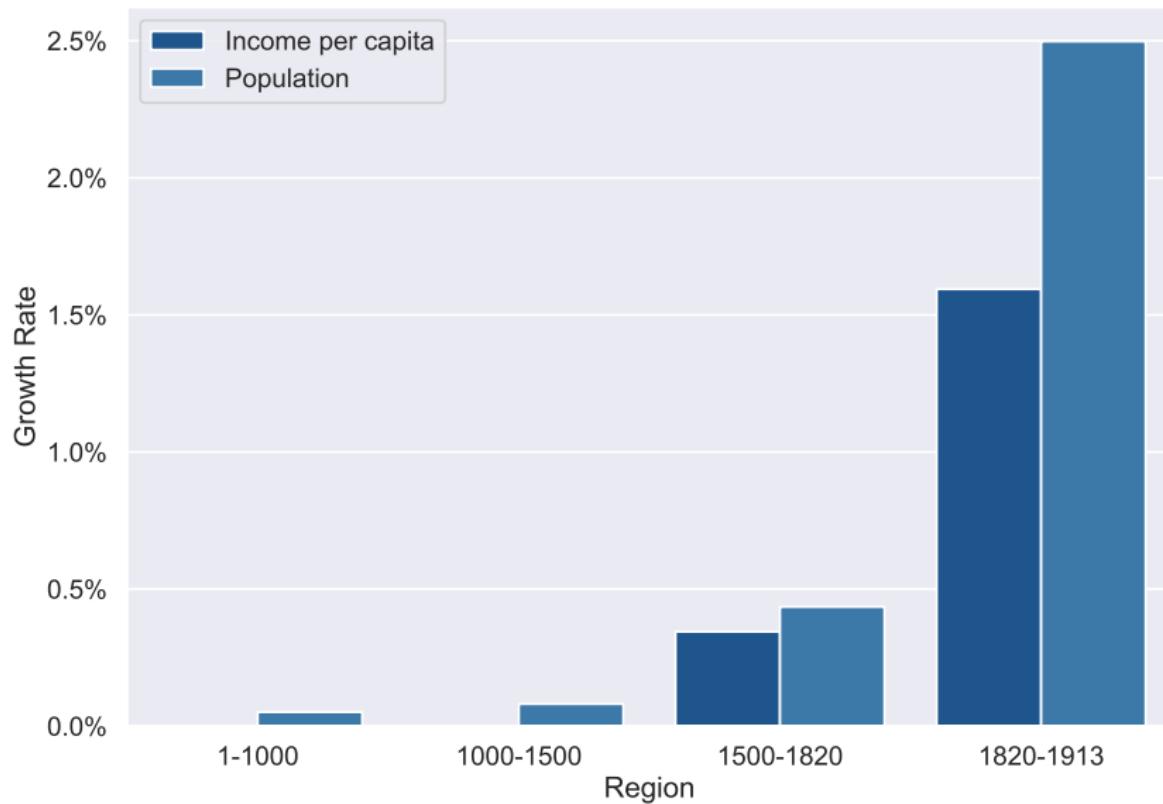
## Regional Variation in the Timing of the Take-off



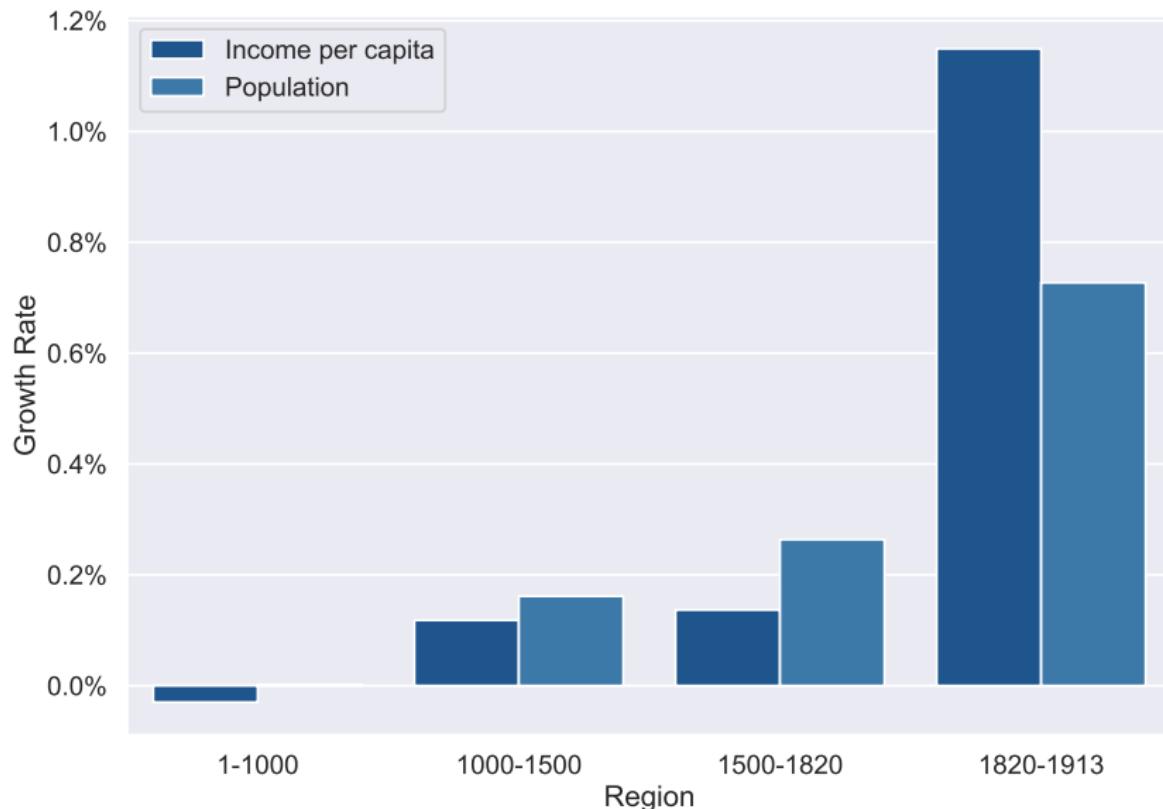
## Take-off: Growth of Population & Income per Capita – World



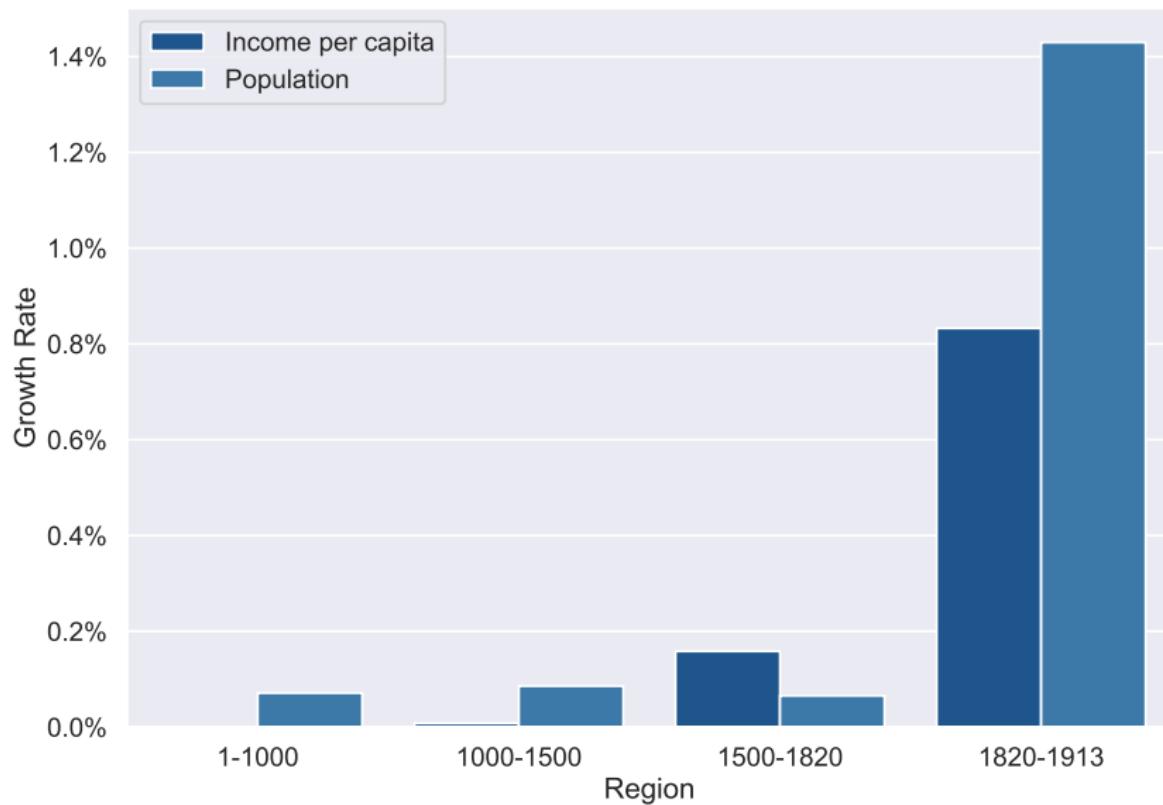
## Take-off: Growth of Population & Income per Capita – Western Offshoots



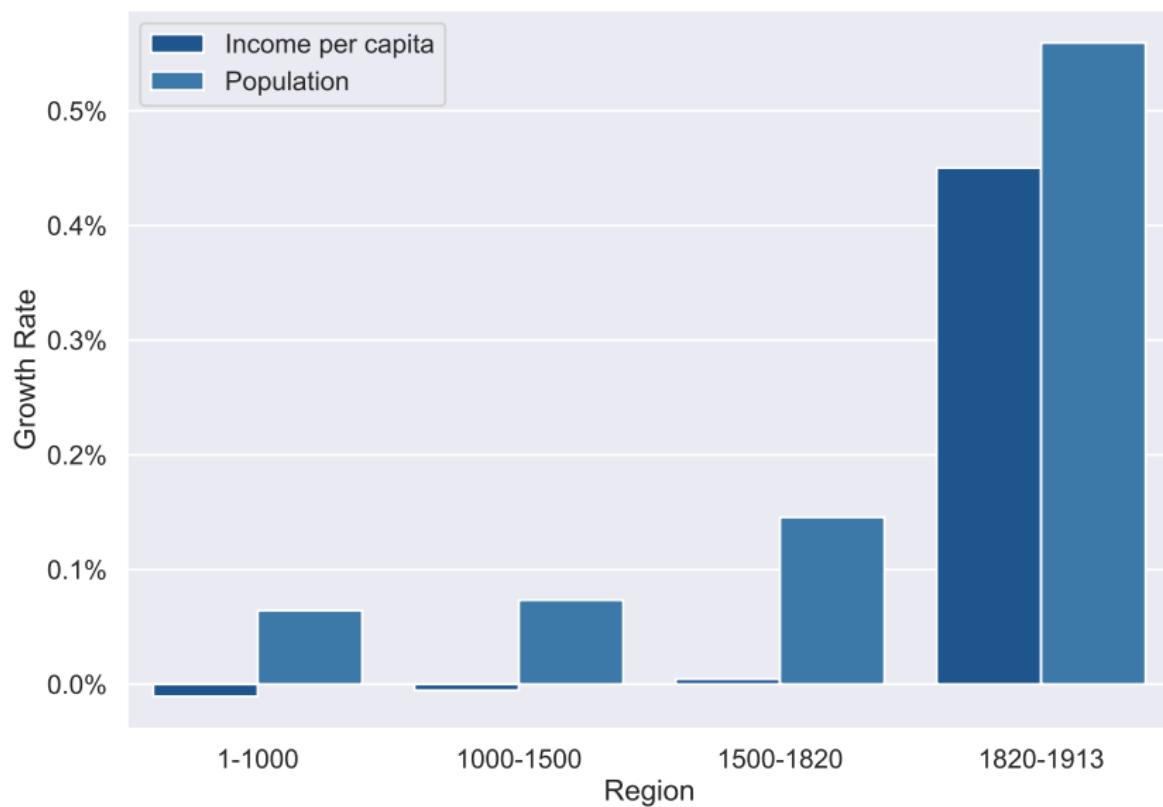
## Take-off: Growth of Population & Income per Capita – Western Europe



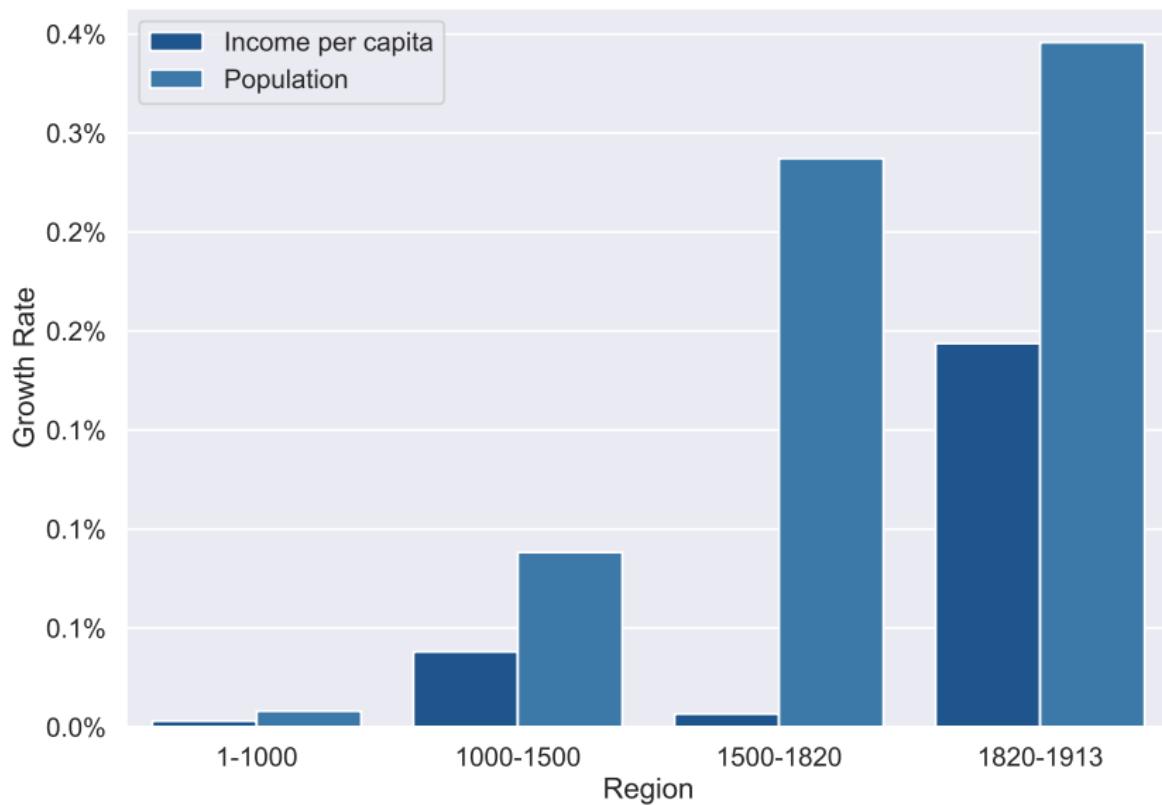
## Take-off: Growth of Population & Income per Capita – Latin America



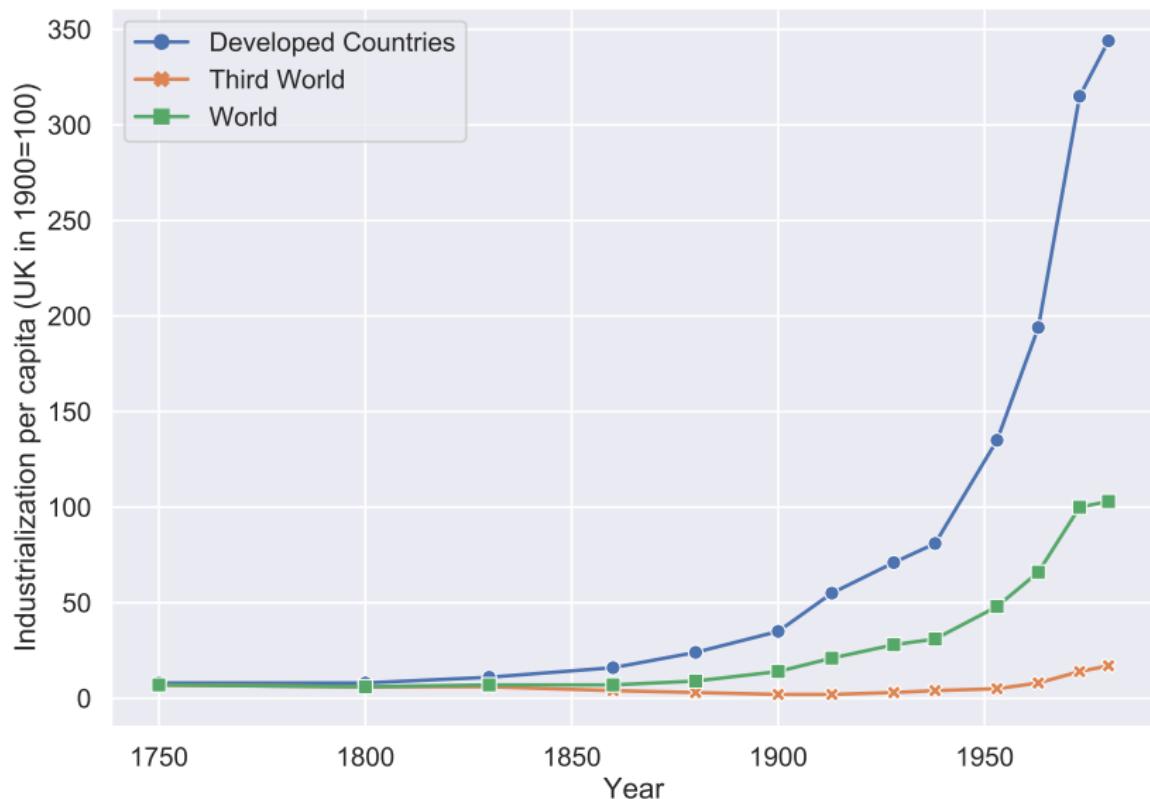
## Take-off: Growth of Population & Income per Capita – Africa



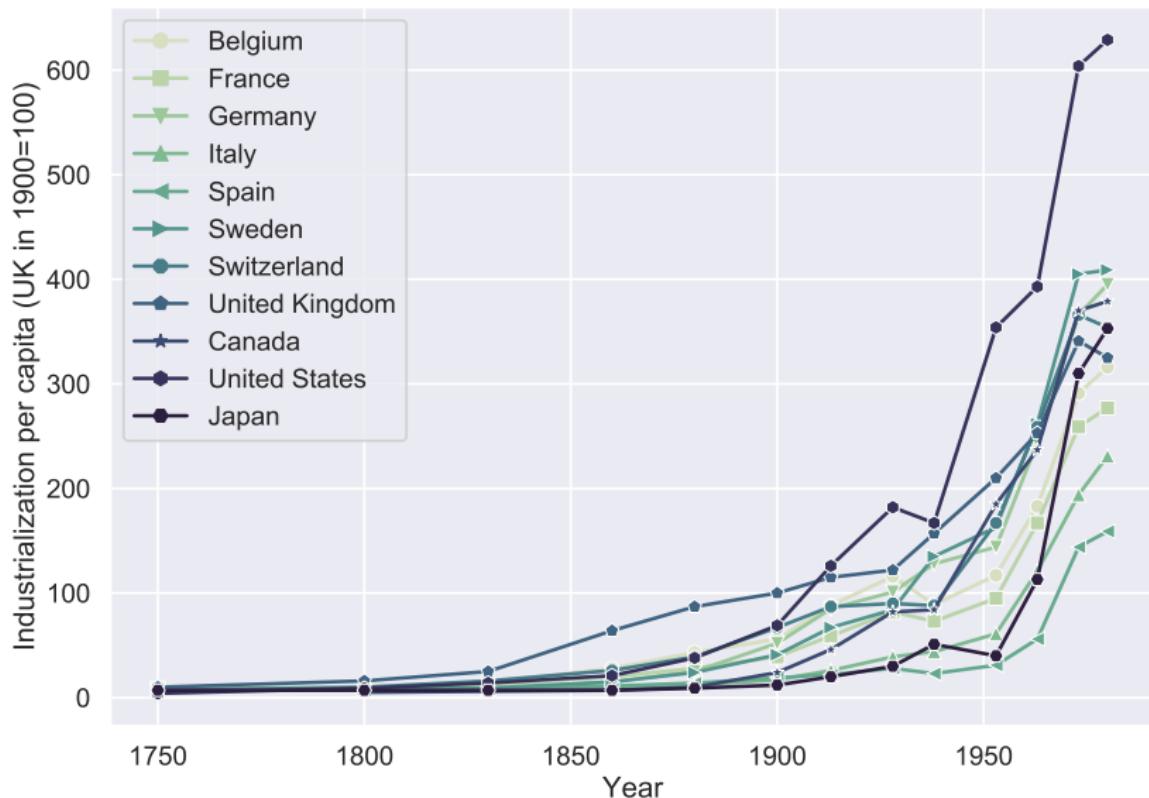
## Take-off: Growth of Population & Income per Capita – Asia



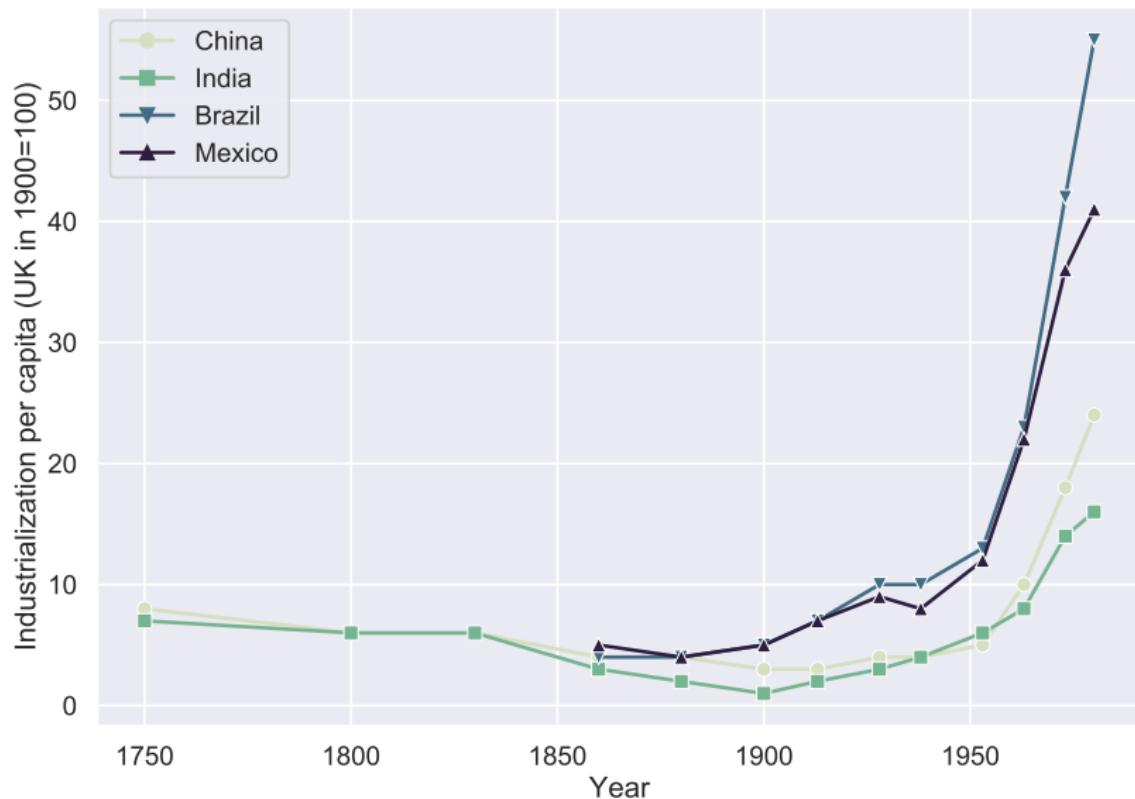
## Take-off & Increased Industrialization per Capita



## Take-off & Increased Industrialization per Capita – Developed Countries



## Take-off in Developed Economies & Decline in Industrialization in LDCs



## The Modern Growth Regime

- Sustained economic growth
  - Acceleration in technological progress
    - → Industrial demand for human capital
  - Human capital formation
    - → Decline in fertility rates (substitution of quantity by quality)
  - The decline in population growth
    - → Freed the growth process from counterbalancing effects of population growth
  - Technological progress, human capital formation & decline in population growth
    - → Sustained economic growth

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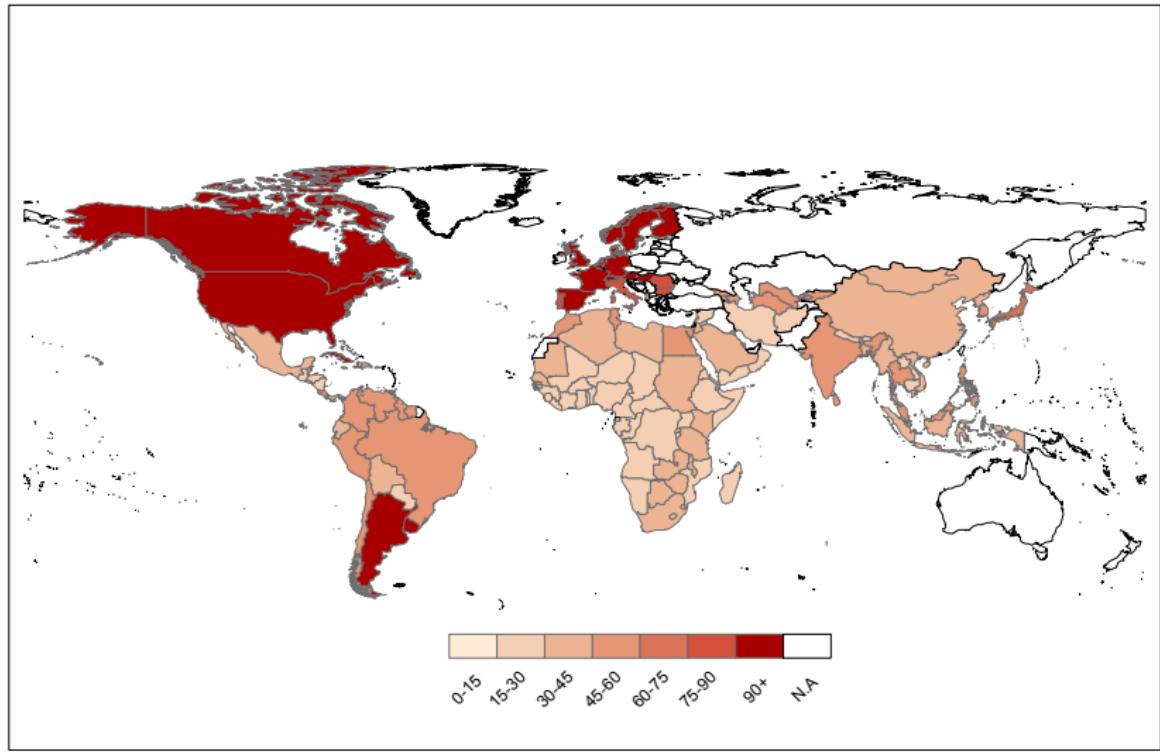
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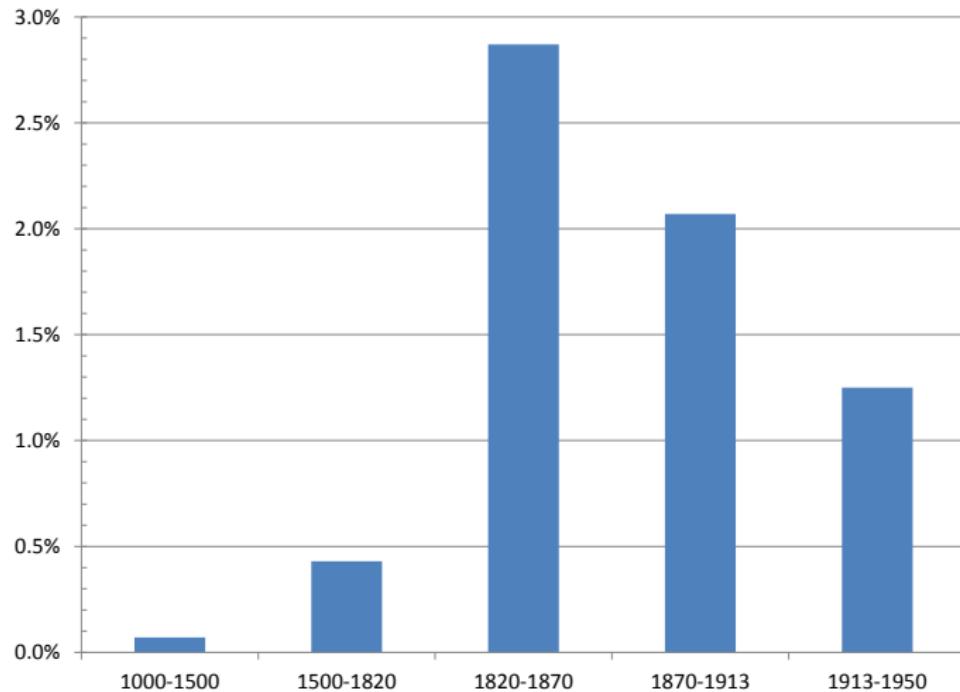
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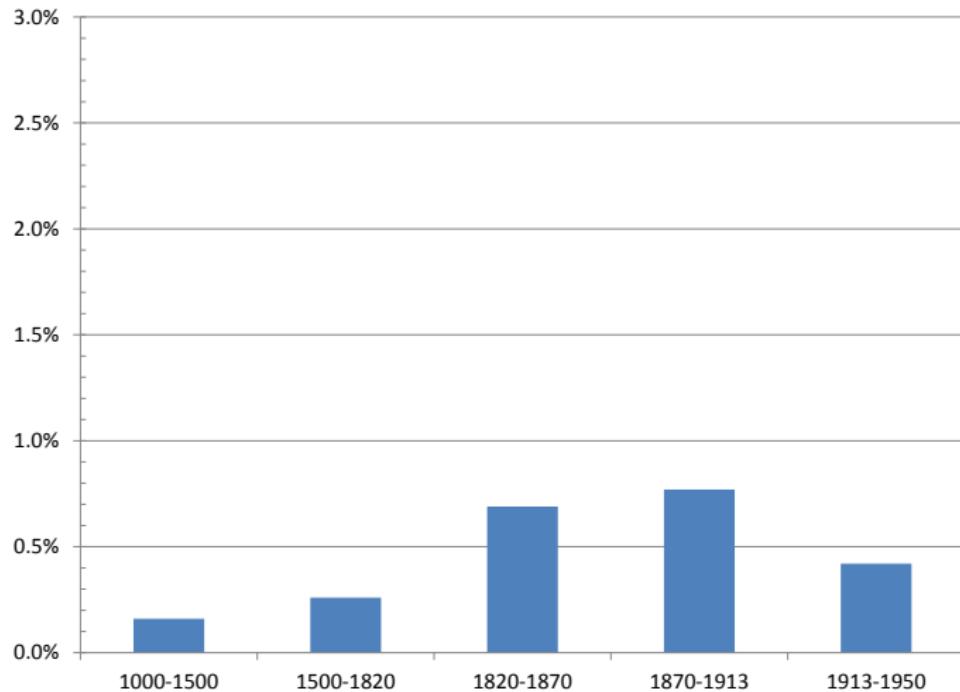
## Variation in Years Elapsed since the Onset of the Fertility Decline



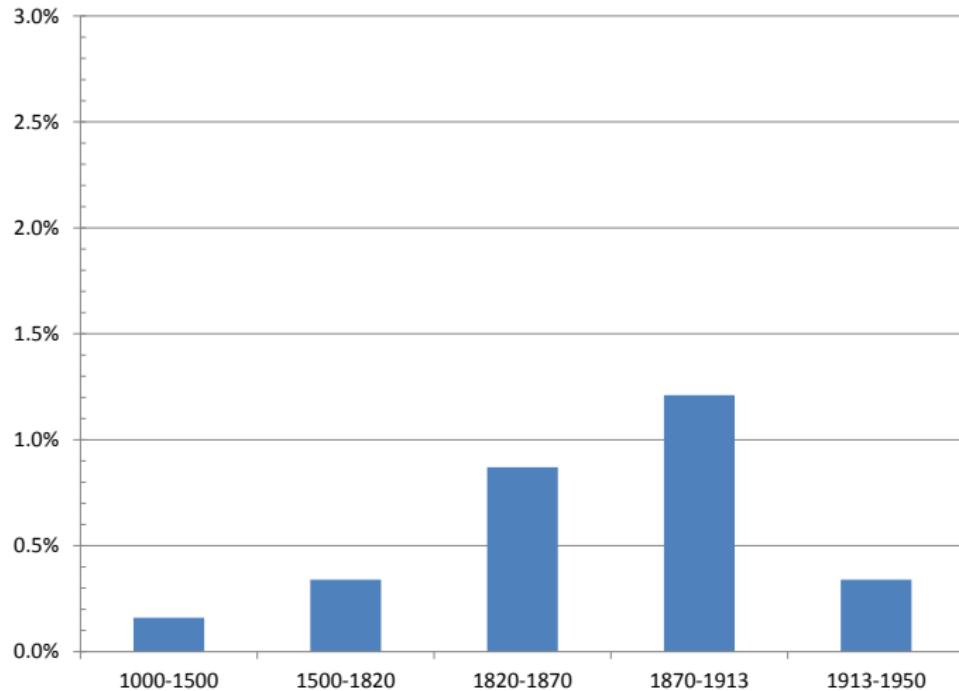
## Early Fertility Decline – Western Offshoots



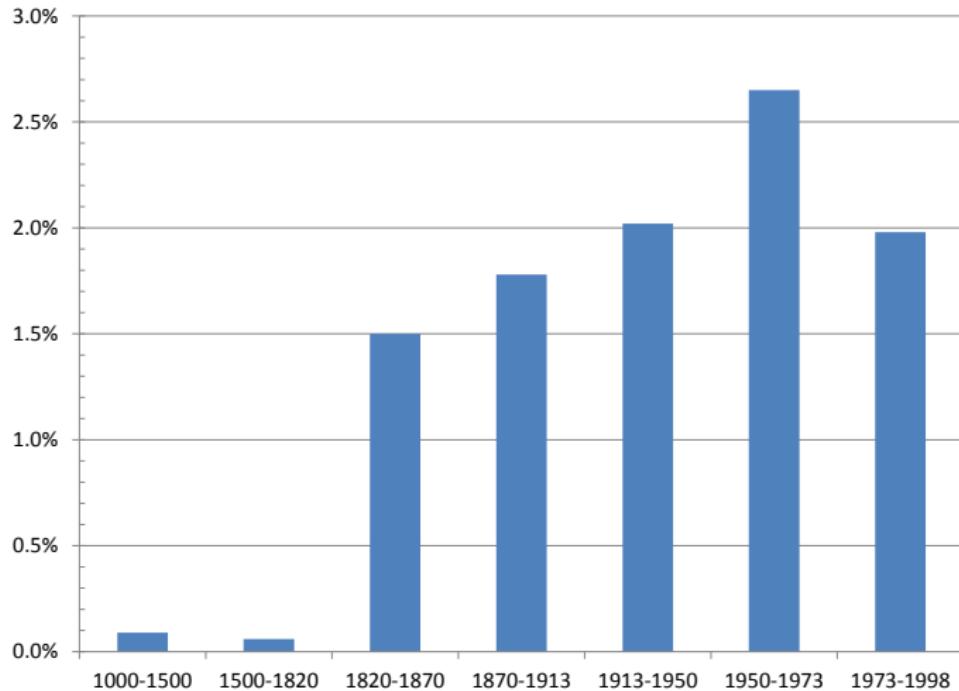
## Early Fertility Decline – Western Europe



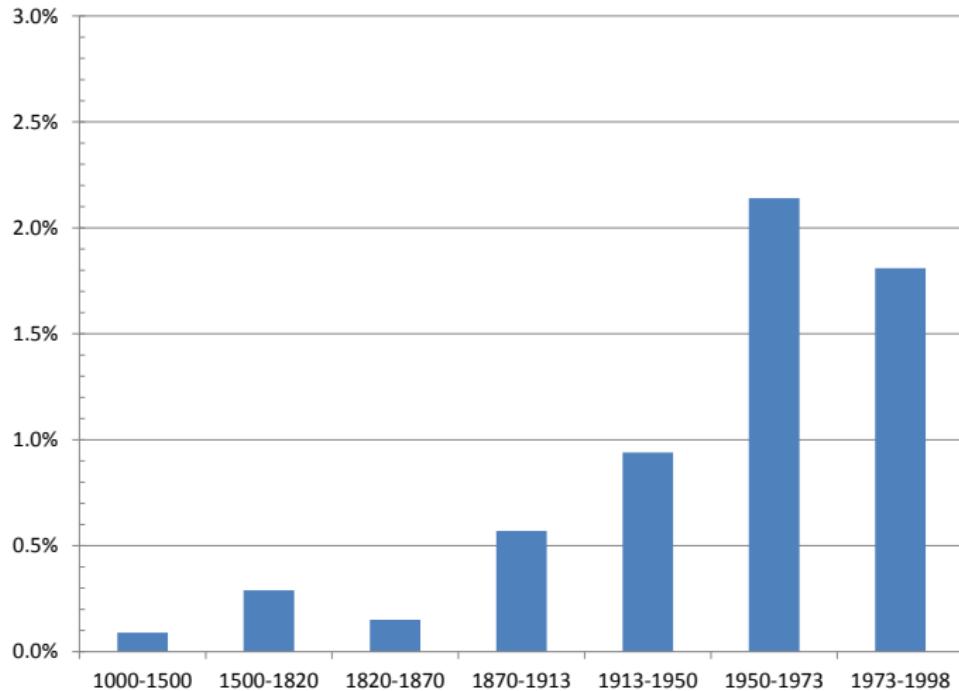
## Early Fertility Decline – Eastern Europe



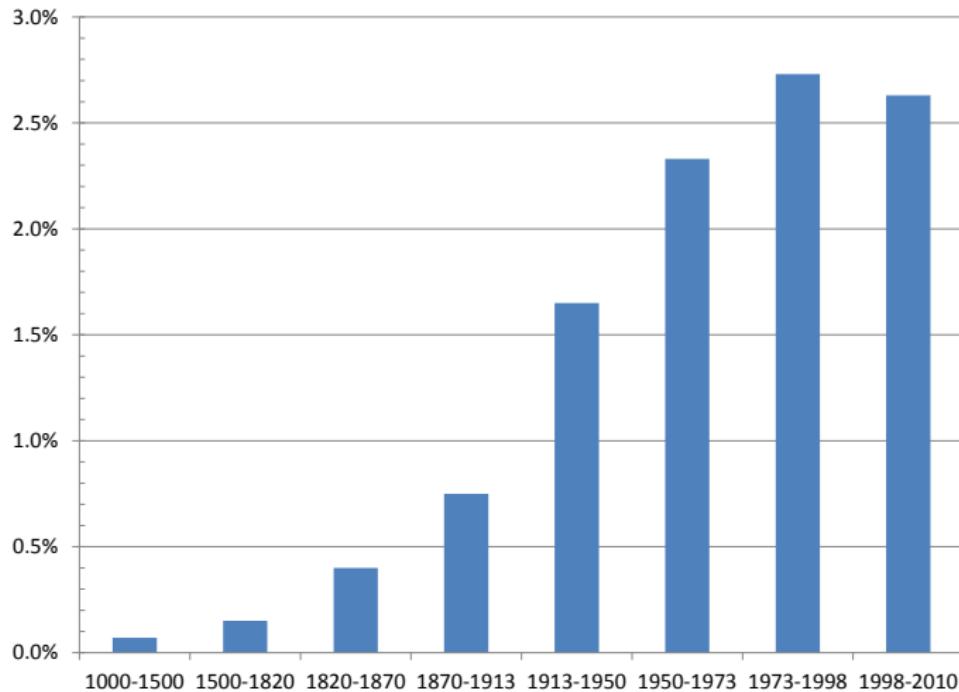
## Late Fertility Decline – Latin America



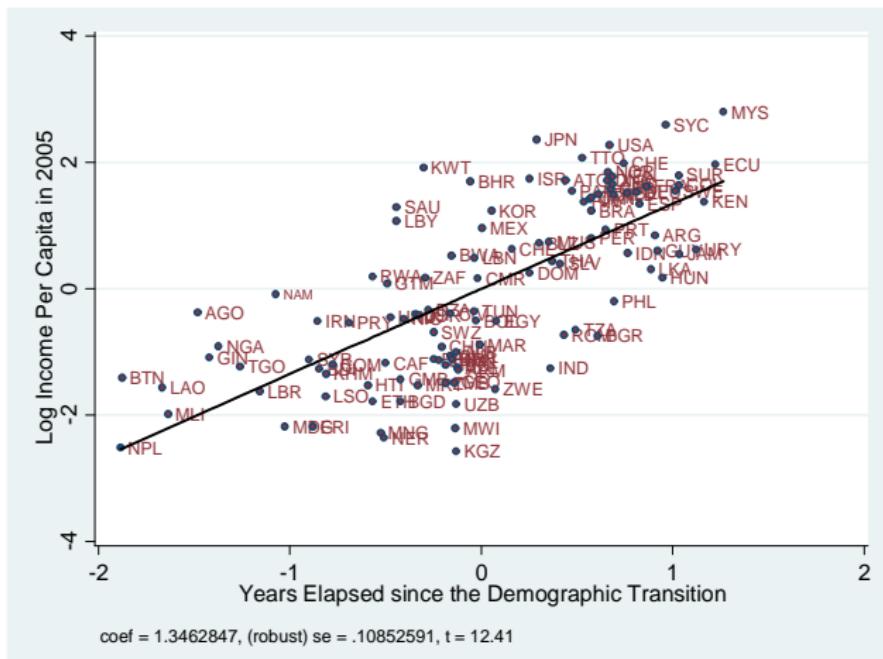
## Late Fertility Decline – Asia



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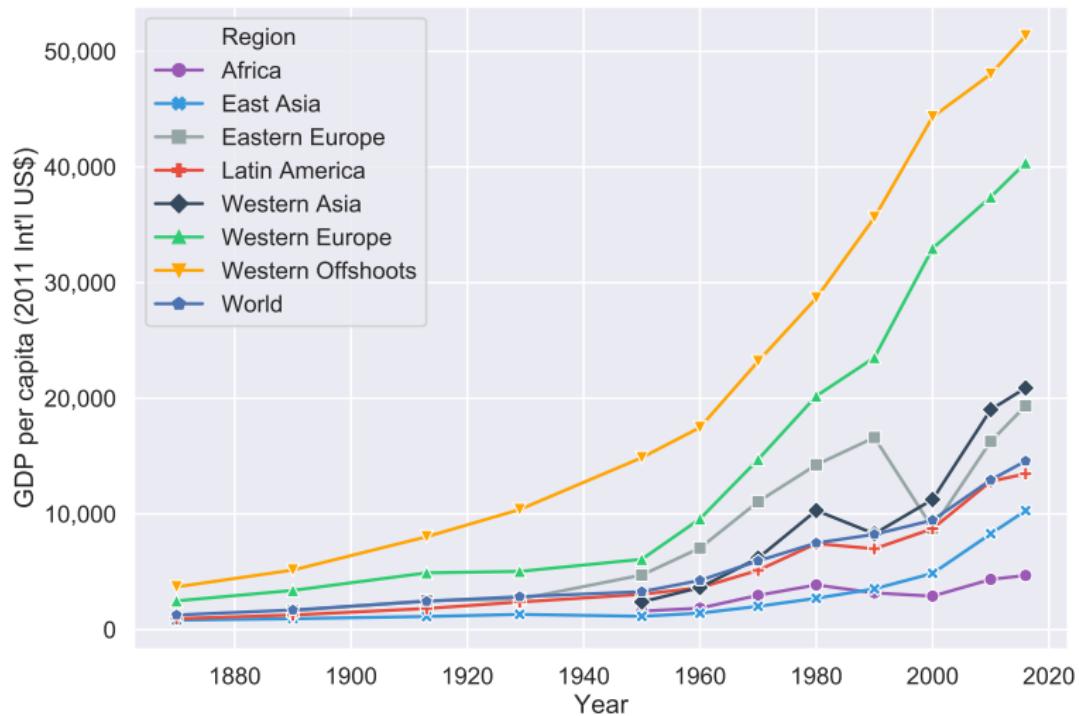


# Timing of the Demographic Transition and Current Income per Capita

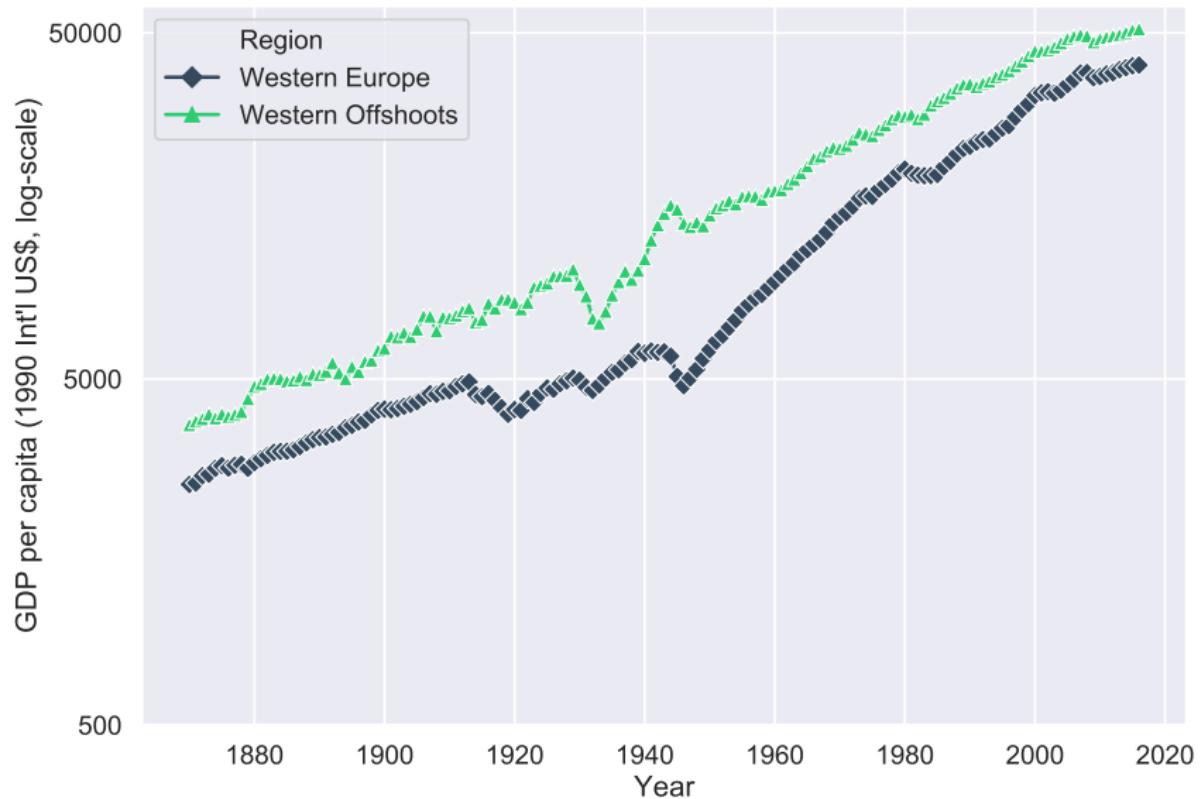


Conditional on absolute latitude.

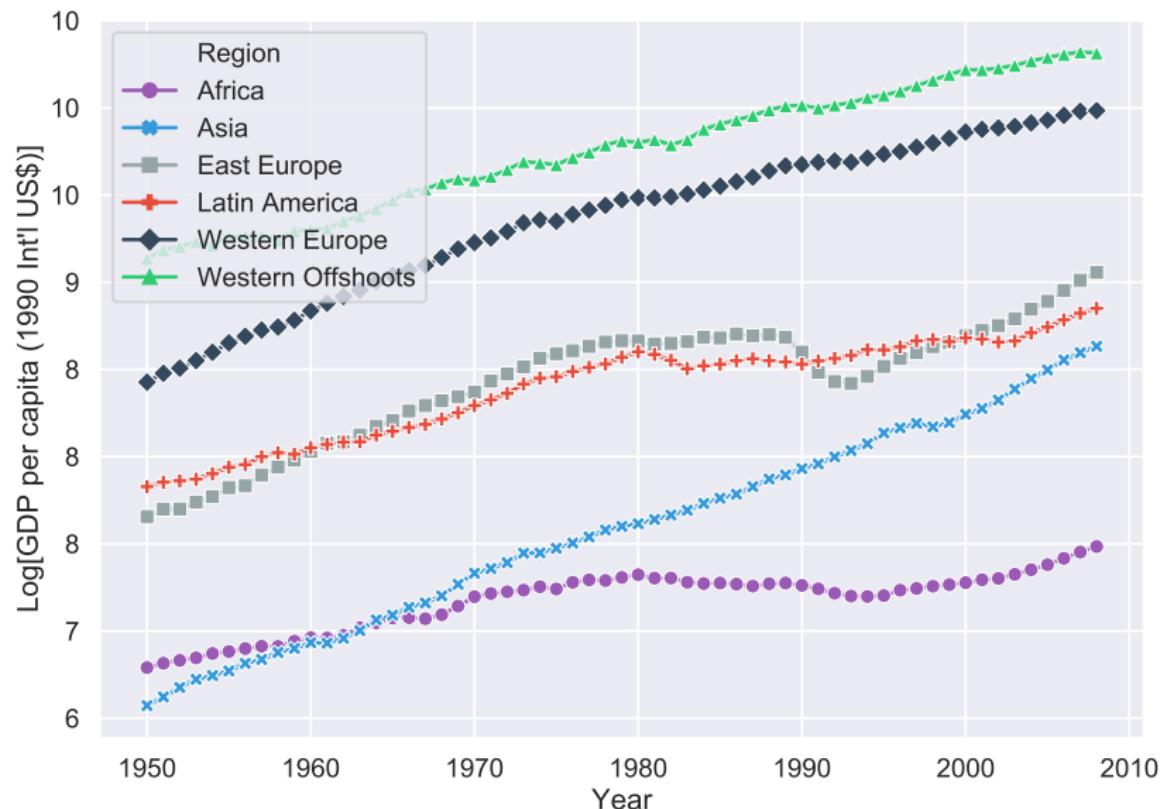
# Timing of the Demographic Transition and Divergence across Regions



## Sustained Economic Growth: 1870–2000



## Regional Variation in Growth of Income per Capita: 1950–2000



## Fundamental Research Questions: The Malthusian Epoch

- What accounts for the epoch of stagnation that characterized most of human history?
  - Why did episodes of technological progress in the pre-industrialization era fail to generate sustained economic growth?
  - Why did increased productivity generated population growth rather than growth in income per capita?

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## Proximate Causes of Growth

- Factor Accumulation:

- Physical capital accumulation (Solow, QJE 1956)
- Human capital accumulation (Lucas, JME 1988)

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  - GT: growth rates decline in the transition to sustained growth
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  - Openness to international capital markets
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  - Openness to international capital markets
  - Technological diffusion
    - $\Rightarrow$  failed to generate convergence
- Why do some societies fail to:
  - Efficiently invest in physical and human capital?
  - Adopt advanced technologies?

## Barriers to Accumulation and Innovation

### ● Inequality

- Suboptimal accumulation of human and physical capital
  - Credit market imperfections (Galar-Zeira, RES 1993)
  - Sociopolitical instability (Alesina et al., JEG 1996)
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- Inefficient Institutions (limited protection of property rights & rule of law)
  - Reduced incentive to accumulate/innovate (North, 1981; Acemoglu-Robinson, 2012)

### ● Ethnic fractionalization

- Sociopolitical instability & Inefficient provision of public goods

→ Ethnic fractionalization → ethnic heterogeneity → ethnic conflict → political instability → inefficient institutions → low economic growth

### ● Limited Social capital (limited trust & cooperation)

- Suboptimal investment (Putnam, 1993; Giuliano et al., JEP 2006; Tabellini, JEEA 2010)

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## Persistent Effects of Geographical Factors

- Land suitable for large plantations
  - Inequality:
    - Extractive institutions (Engerman-Sokoloff, 1997)
  - Concentration of landownership:
    - Suboptimal investment in public education (Galor-Moav-Vollrath, RES 2009)
- Soil quality conducive for agriculture
  - Specialization in unskilled-intensive goods
    - Fertile soil → more labor intensive agriculture → more unskilled labor → more unskilled intensive goods

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## Persistent Effects of Geographical Factors

- Range of soil quality

- Emergence of geographical specific human capital  $\implies$  reduced mobility  
 $\implies$  ethnic fractionalization (Michalopoulos, AER 2012)
    - Persistent effect of ethnic fractionalization (Easterly-Levine, QJE 1997)

- Ecological diversity & storable crops

- Emergence & persistence of state capacity (Fenske, JEEA 2014;  
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## Persistent Effects of Intergenerationally Transmitted Traits

- Natural selection of traits that are complementary to the growth process:
  - Preference for education (Galor-Moav, QJE 2002; Galor-Klemp, 2018)
  - Entrepreneurial spirit (Galor-Michalopoulos, JET 2012)
  - Time Preference (Galor-Özak, AER 2016)
- Cultural distance between societies reduces:
  - Diffusion from the technological frontier (Spolaore-Wacziarg, QJE 2009)
  - Conflict (Spolaore-Wacziarg, REStat 2016; Depetris-Özak, 2019)
- Cultural diversity within a society:
  - Reduces cohesiveness:
    - Reduces social norms & values that favor meritocracy, innovation, and entrepreneurship
    - Encourages greater tolerance for different ideas and perspectives
  - Generates a wider range of complementary traits conducive for specialization & innovations (Ashraf-Galor, AER 2013; Depetris-Özak, 2015, 2016)
    - Encourages greater specialization and division of labor
    - Promotes a diverse pool of talent and skills
  - Has a hump-shaped effect on productivity (Ashraf-Galor, AER 2013)
    - Lower income in overly homogenous & diverse societies

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    - Encourages individuals to specialize in different fields based on their unique traits
    - Promotes a diverse pool of talent and ideas, leading to more innovations and discoveries
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    - Reduces conflict & promotes innovation (Ashraf-Galor, AER 2013; Depetris-Özak, 2015, 2016)
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  - Reduces cohesiveness:
    - Higher cultural fragmentation (Ashraf-Galor, AER-PP 2013)
    - Increased mistrust & prevalence of civil conflict (Arbatli-Ashraf-Galor, 2018)
  - Generates a wider range of complementary traits conducive for specialization & innovations (Ashraf-Galor, AER 2013; Depetris-Özak, 2015, 2016)
    - Emergence of states & autocracy (Depetris-Özak, 2015; Galor-Klemp, 2015)
  - Has a hump-shaped effect on productivity (Ashraf-Galor, AER 2013)
    - Lower income in overly homogenous & diverse societies

## Persistent Effects of Intergenerationally Transmitted Traits

- Natural selection of traits that are complementary to the growth process:
  - Preference for education (Galor-Moav, QJE 2002; Galor-Klemp, 2018)
  - Entrepreneurial spirit (Galor-Michalopoulos, JET 2012)
  - Time Preference (Galor-Özak, AER 2016)
- Cultural distance between societies reduces:
  - Diffusion from the technological frontier (Spolaore-Wacziarg, QJE 2009)
  - Conflict (Spolaore-Wacziarg, REStat 2016; Depetris-Özak, 2019)
- Cultural diversity within a society:
  - Reduces cohesiveness:
    - Higher cultural fragmentation (Ashraf-Galor, AER-PP 2013)
    - Increased mistrust & prevalence of civil conflict (Arbatli-Ashraf-Galor, 2018)
  - Generates a wider range of complementary traits conducive for specialization & innovations (Ashraf-Galor, AER 2013; Depetris-Özak, 2015, 2016)
    - Emergence of states & autocracy (Depetris-Özak, 2015; Galor-Klemp, 2015)
  - Has a hump-shaped effect on productivity (Ashraf-Galor, AER 2013)  
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