

# Growth and Comparative Development

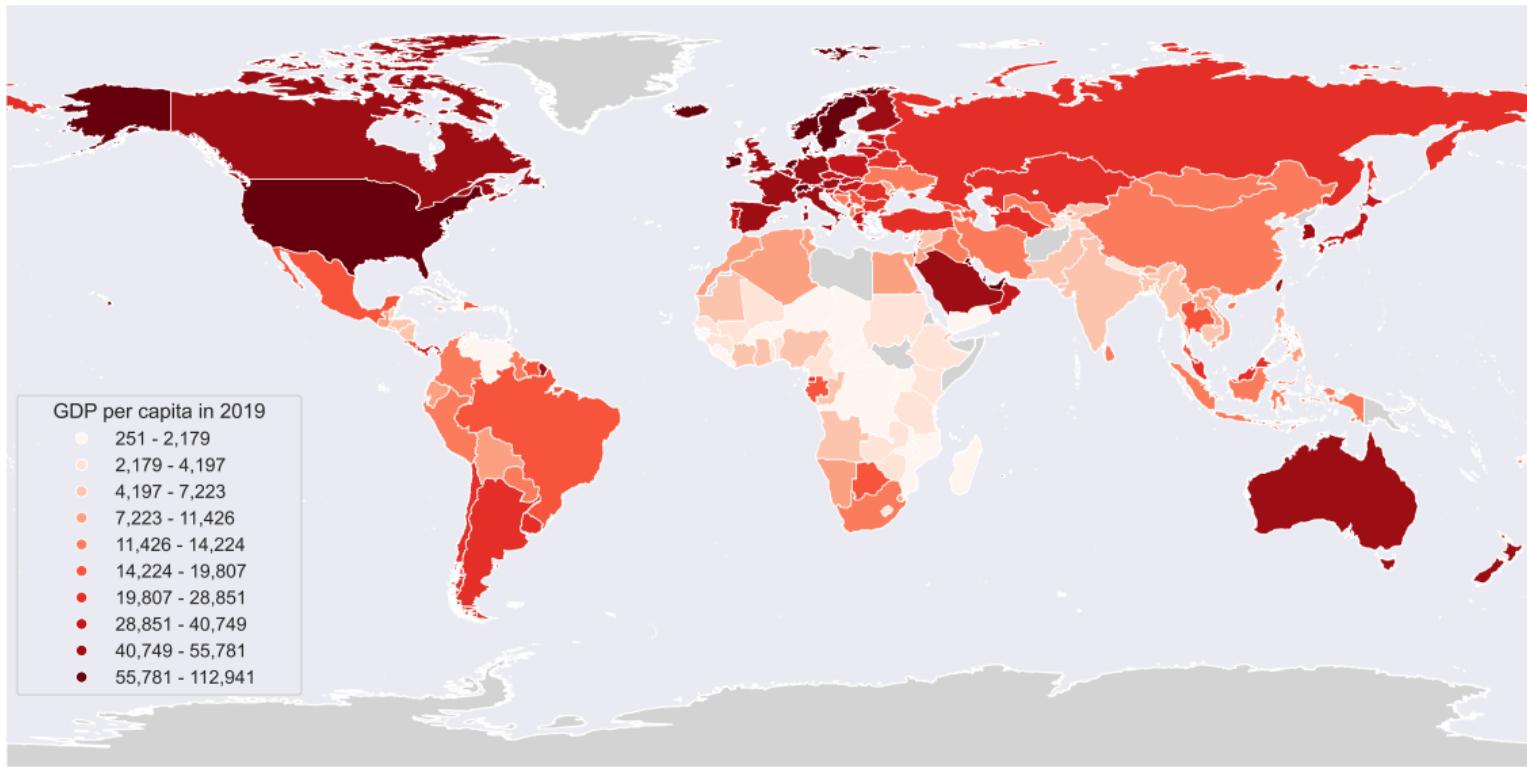
## The Big Picture & Overview

Ömer Özak

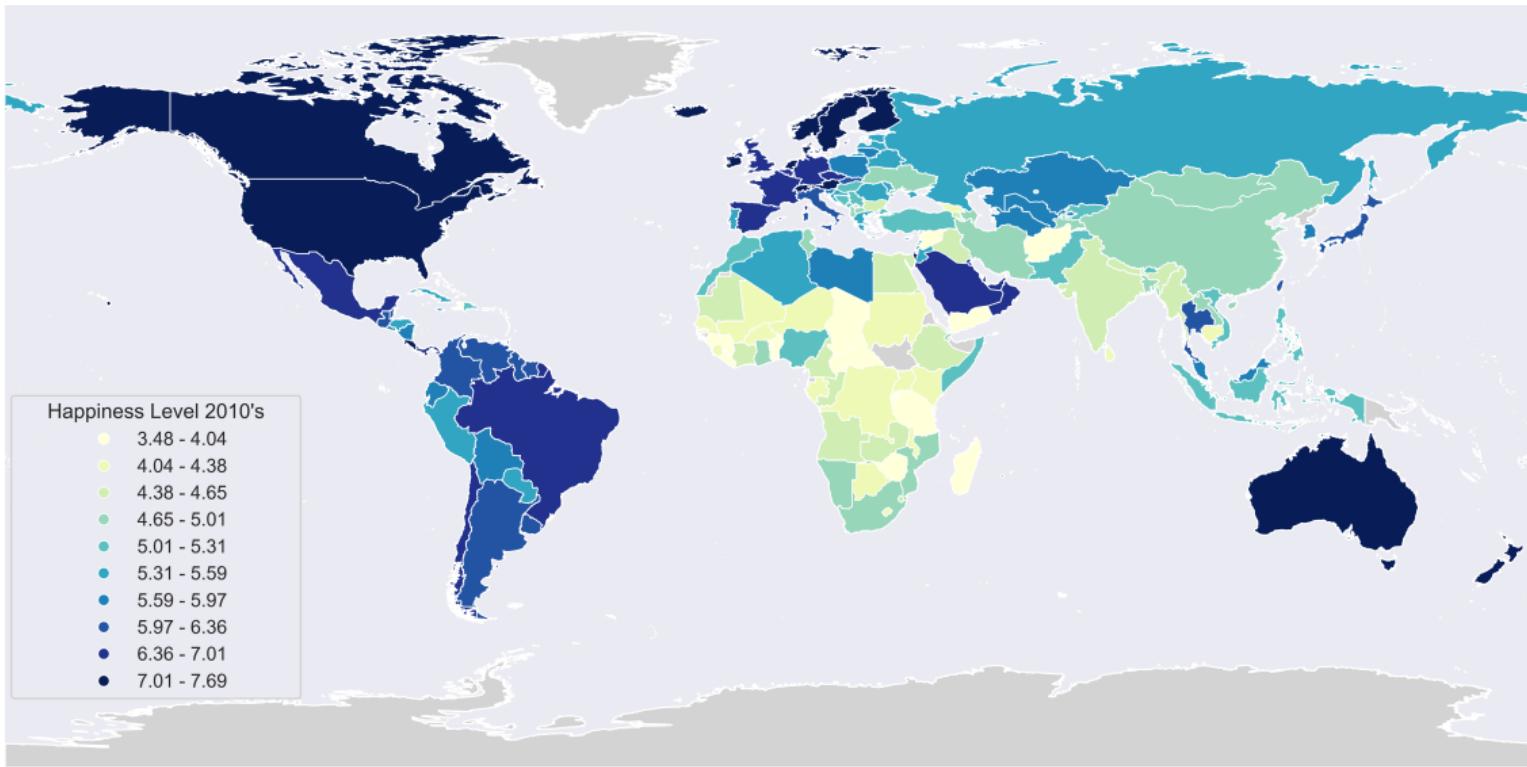
Department of Economics  
Southern Methodist University

Economic Growth and Comparative Development

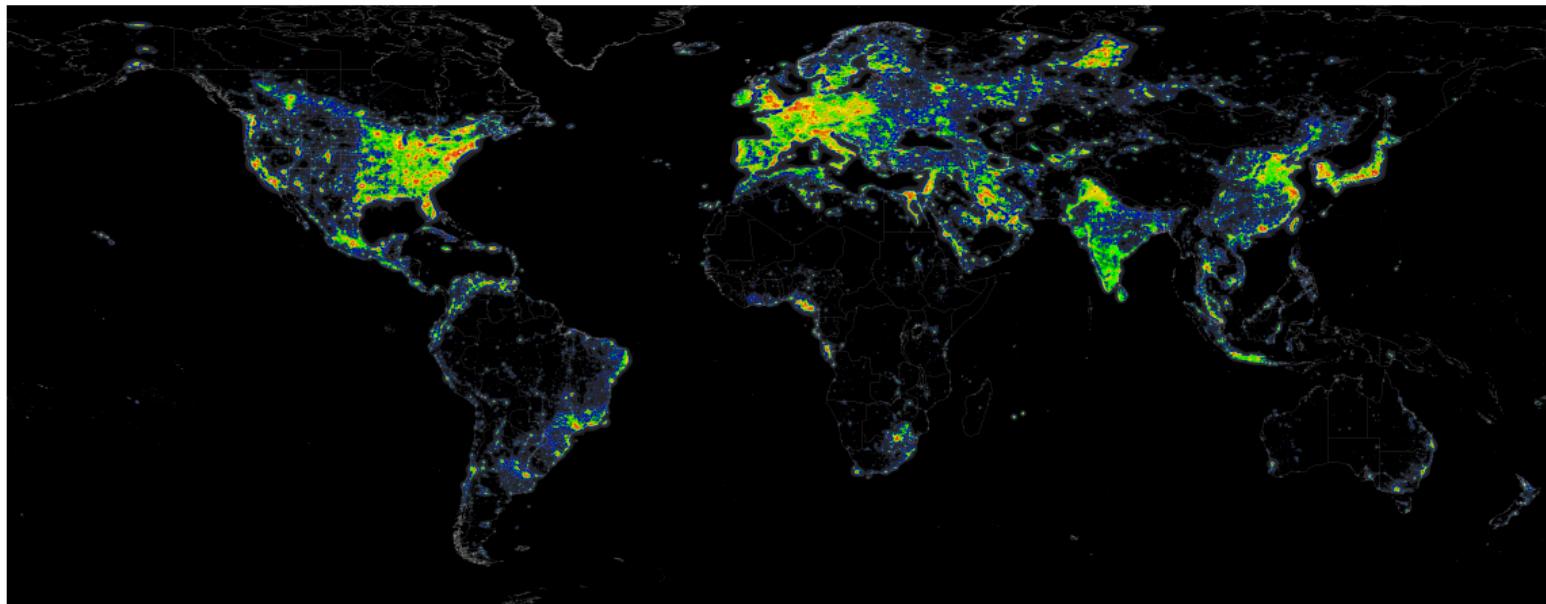
# Income per Capita across the Globe in 2019



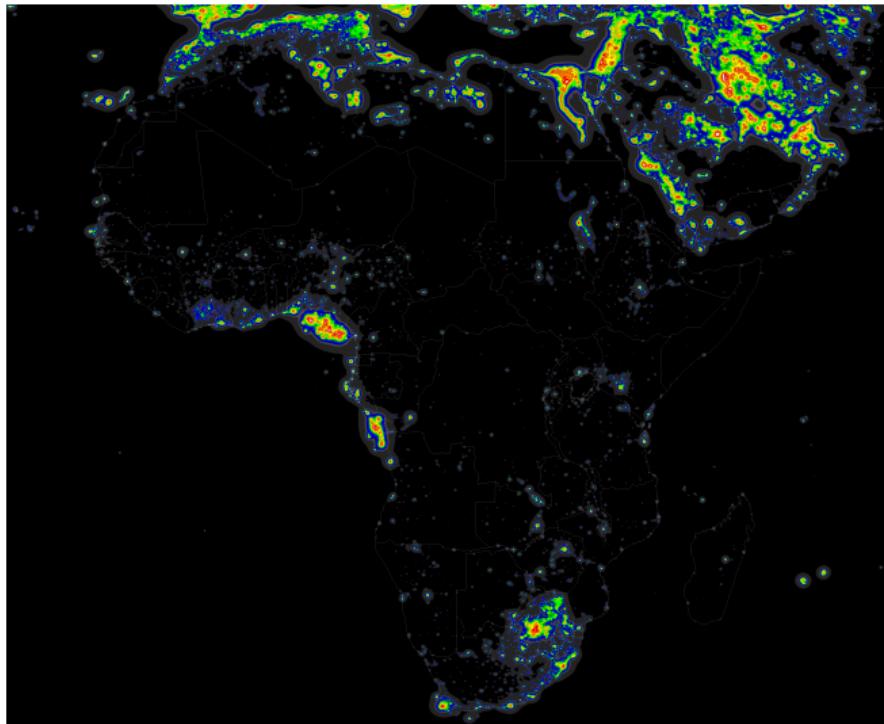
# Happiness across the Globe in 2005-2018



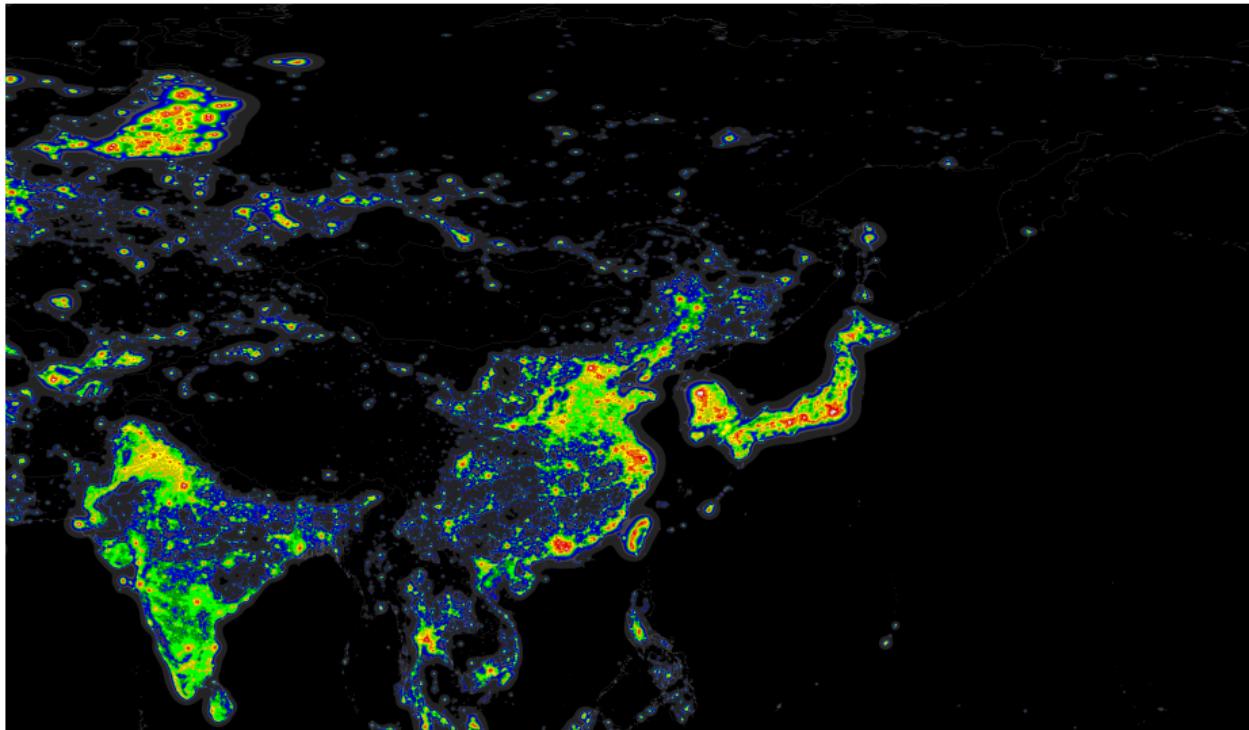
## Night Lights across the Globe in 2016



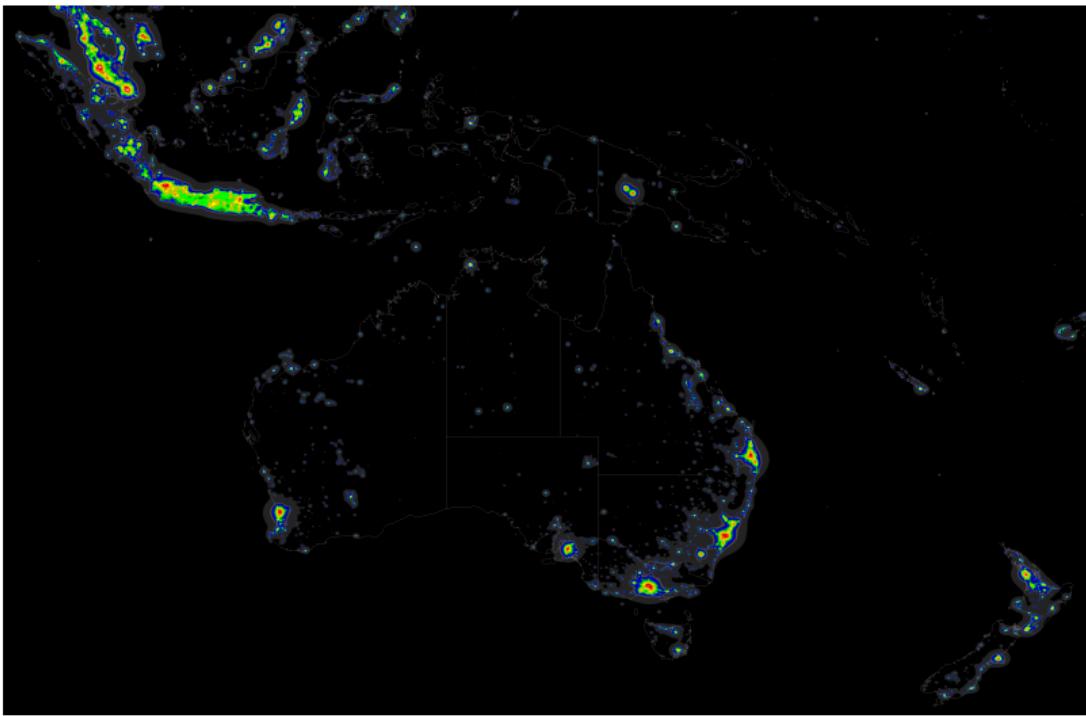
## Night Lights across Regions – Africa



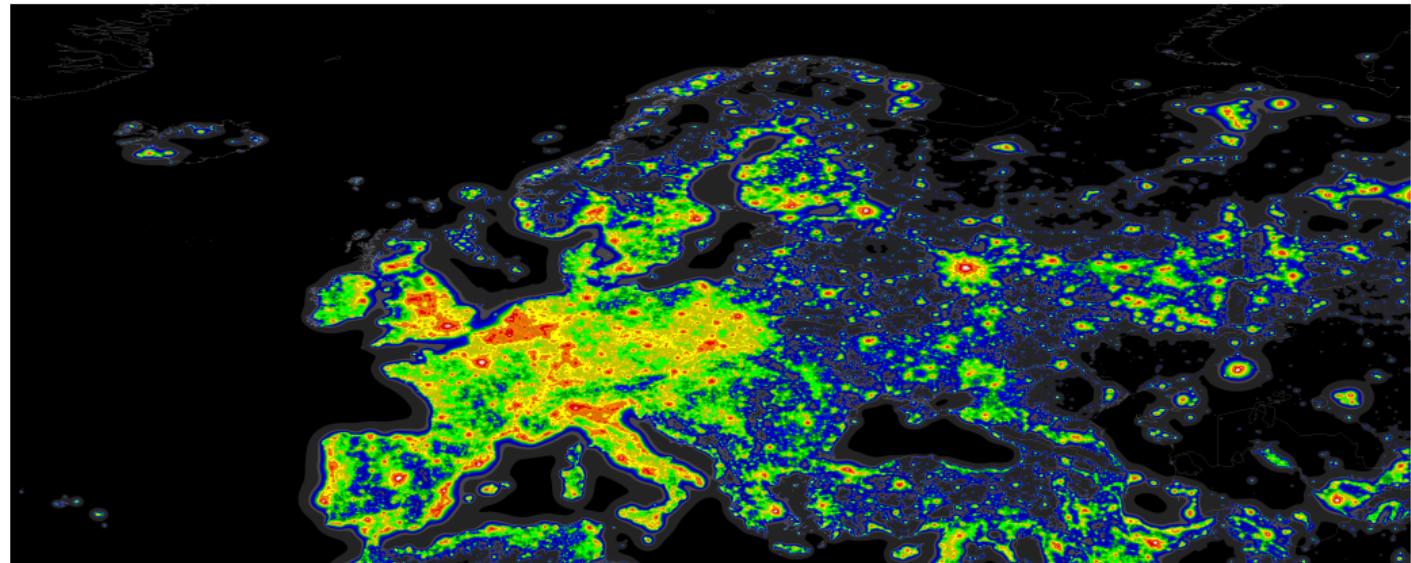
## Night Lights across Regions – Asia



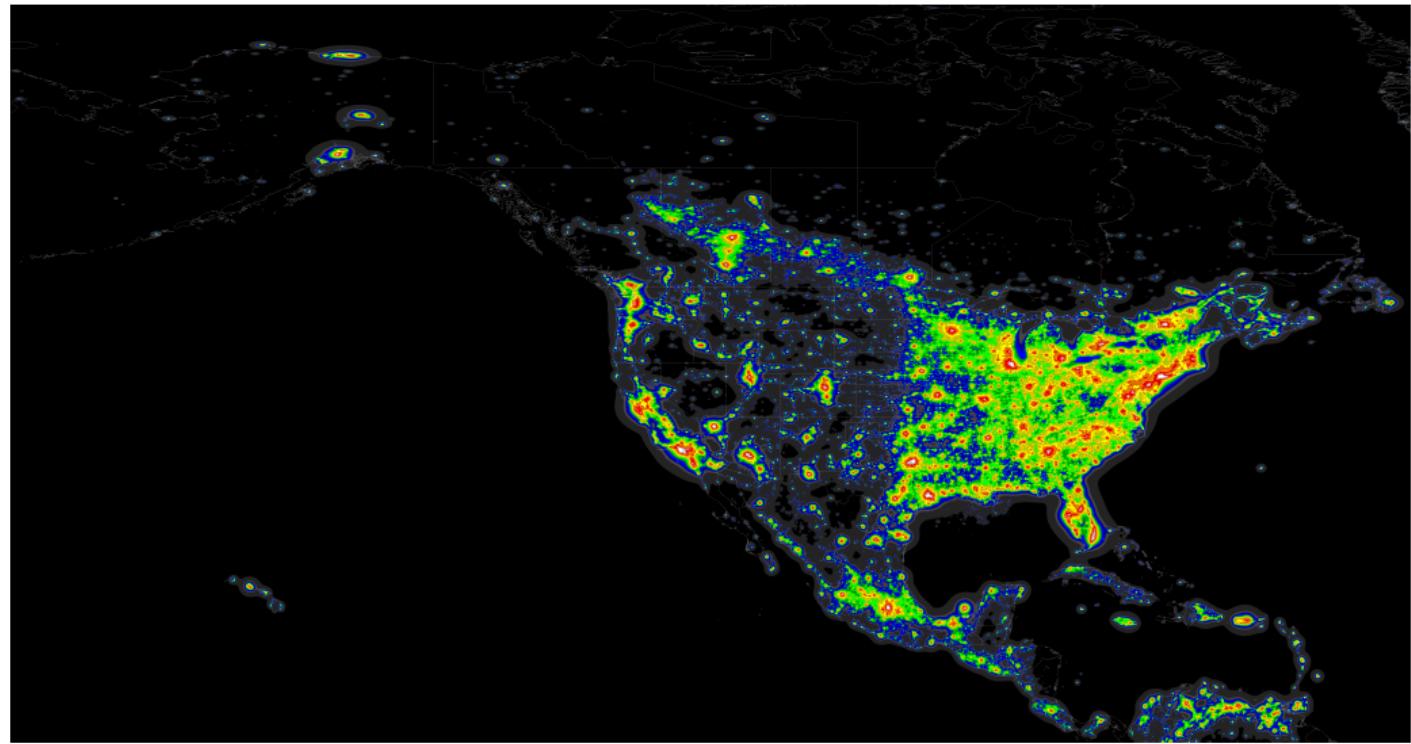
## Night Lights across Regions – Australia



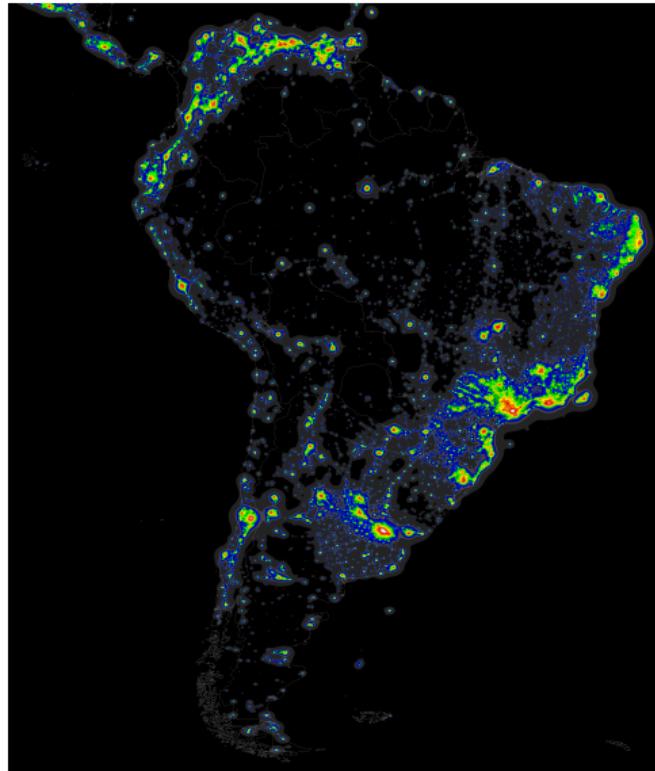
## Night Lights across Regions – Europe



## Night Lights across Regions – North America



## Night Lights across Regions – South America



## Fact 1: Income Differences across Countries/Regions/Societies

**There is enormous variation in per capita income across economies. The poorest countries have per capita incomes that are less than 5 percent of per capita income in the richest countries.**

Several notes:

- Income per capita (or GDP per capita) is not the sole measure of what is good: but it's a useful summary statistic
- Income per capita ignores distribution of income within a country
- Comparing income per capita across countries is not trivial
  - You have to convert between currencies
  - Countries have different relative prices for goods
  - What is the “right” way to value haircuts, apples, or cars across countries?

# Top Countries - Different Measures (2009)

Rank	Highest GDP per Capita		Largest Economies		Most Populous Countries	
	Country	GDP per Capita (\$)	Country	Total GDP (\$ trillions)	Country	Population (millions)
1	Qatar	159,469	United States	12.62	China	1,320
2	Luxembourg	84,525	China	10.08	India	1,160
3	United Arab Emirates	52,946	Japan	3.81	United States	307
4	Bermuda	52,090	India	3.76	Indonesia	240
5	Macao	51,057	Germany	2.66	Brazil	199
6	Norway	49,945	United Kingdom	2.07	Pakistan	181
7	Singapore	47,373	Russia	2.05	Bangladesh	154
8	Kuwait	46,639	France	1.98	Nigeria	149
9	Brunei	46,229	Italy	1.68	Russia	140
10	Australia	41,304	Brazil	1.62	Japan	127
11	United States	41,099	Mexico	1.29	Mexico	111

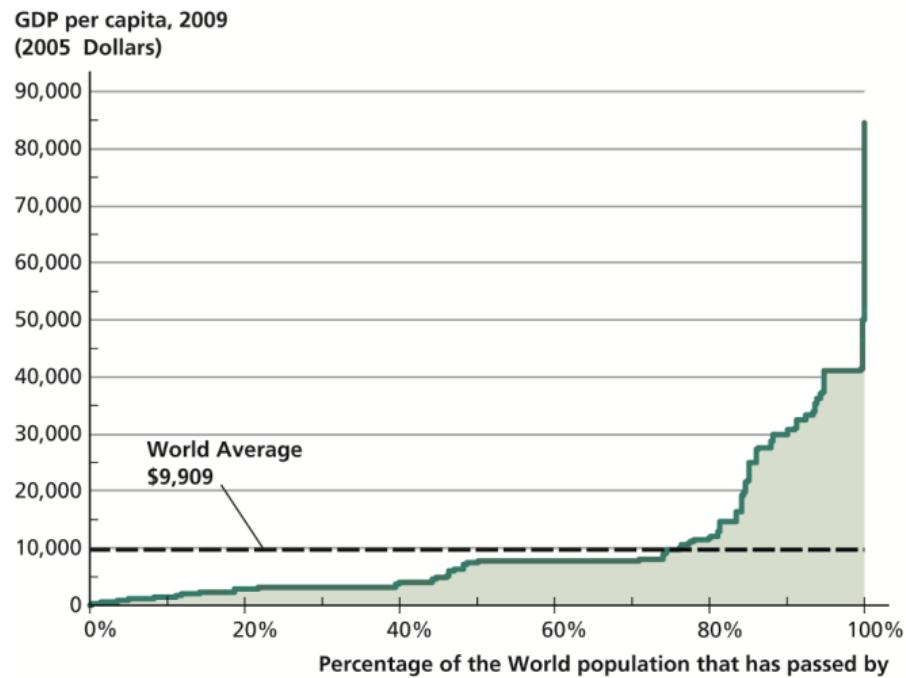
## Rich Countries

Country	GDP per capita 2008	GDP per worker 2008	LF Part. Rate 2008	Avg. Growth 1960-2008	Years to Double
United States	\$43,326	\$84,771	0.51	1.6	43
Japan	33,735	64,778	0.52	3.4	21
France	31,980	69,910	0.46	2.2	30
United Kingdom	35,345	70,008	0.51	1.9	36
Spain	28,958	57,786	0.50	2.7	26

## Poor Countries

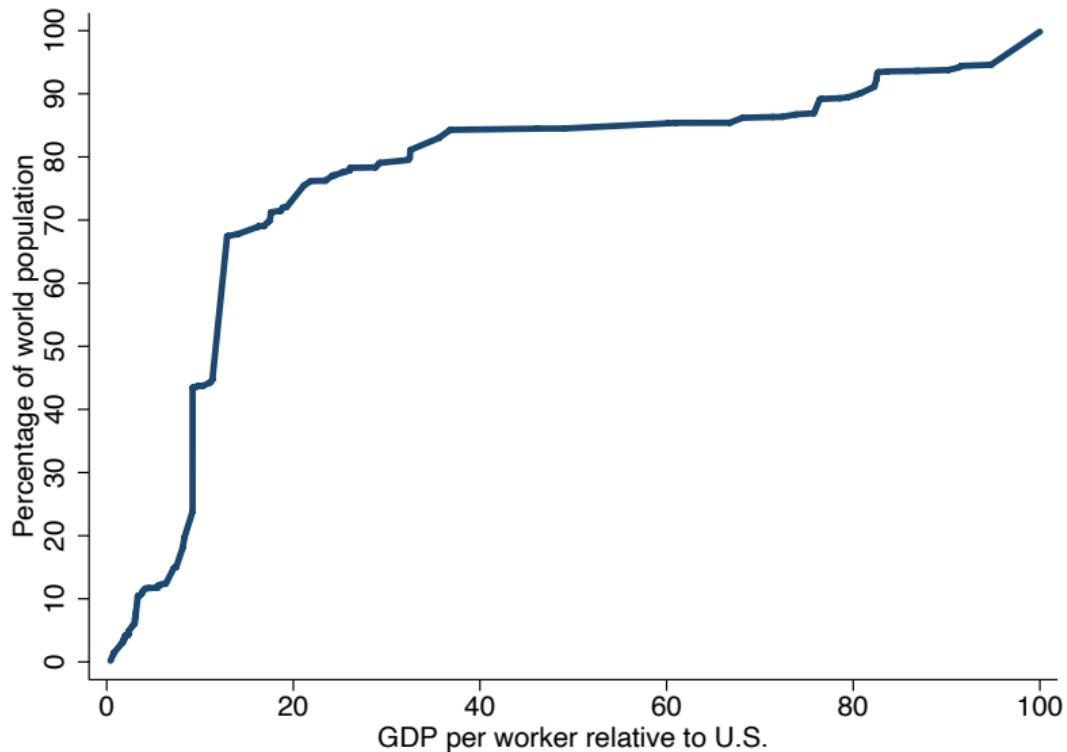
Country	GDP per capita 2008	GDP per worker 2008	LF Part. Rate 2008	Avg. Growth 1960-2008	Years to Double
China	6,415	10,938	0.59	5.6	13
India	3,078	7,801	0.39	3.0	24
Nigeria	1,963	6,106	0.32	0.6	114
Uganda	1,122	2,604	0.43	1.3	52

## Distribution of Population by GDP per Capita, 2009

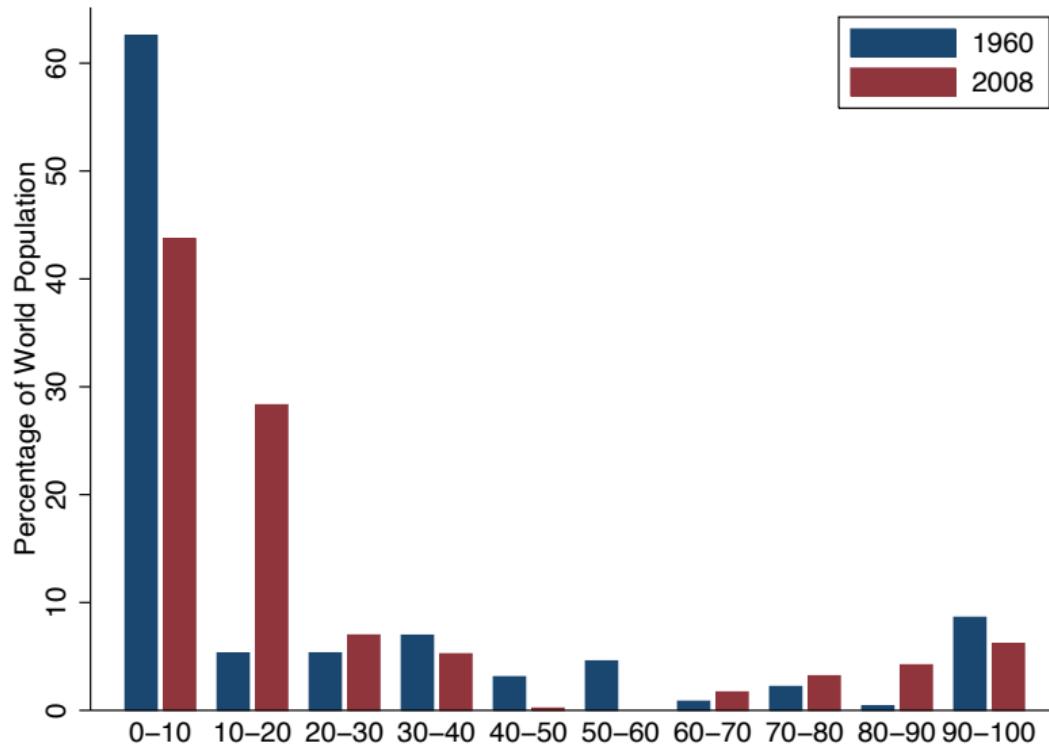


Source: Heston, Summers, and Aten (2011).

## Distribution of Population by GDP per Worker, 2008



## World Population by GDP per Worker, 1960 and 2008



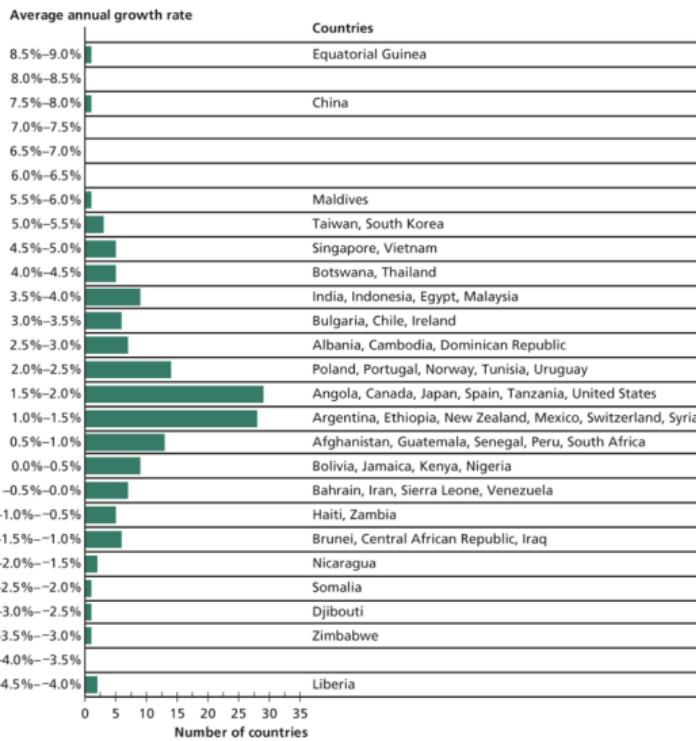
## Fact 2: Growth Rates across Time and Countries

- **Rates of economic growth vary substantially across countries**
  - Important to distinguish permanent from transitional differences
  - If permanent  $\implies$  divergence
  - Economists think most differences are transitional
- **Rates of economic growth vary substantially across time**
  - Growth rates within countries tend to decrease as they become rich

## Fact 2: Growth Rates across Time and Countries

- **Rates of economic growth vary substantially across countries**
  - Important to distinguish permanent from transitional differences
  - If permanent  $\implies$  divergence
  - Economists think most differences are transitional
- **Rates of economic growth vary substantially across time**
  - Growth rates within countries tend to decrease as they become rich

# Growth Rates 1975-2009



Source: Heston, Summers, and Aten (2011).

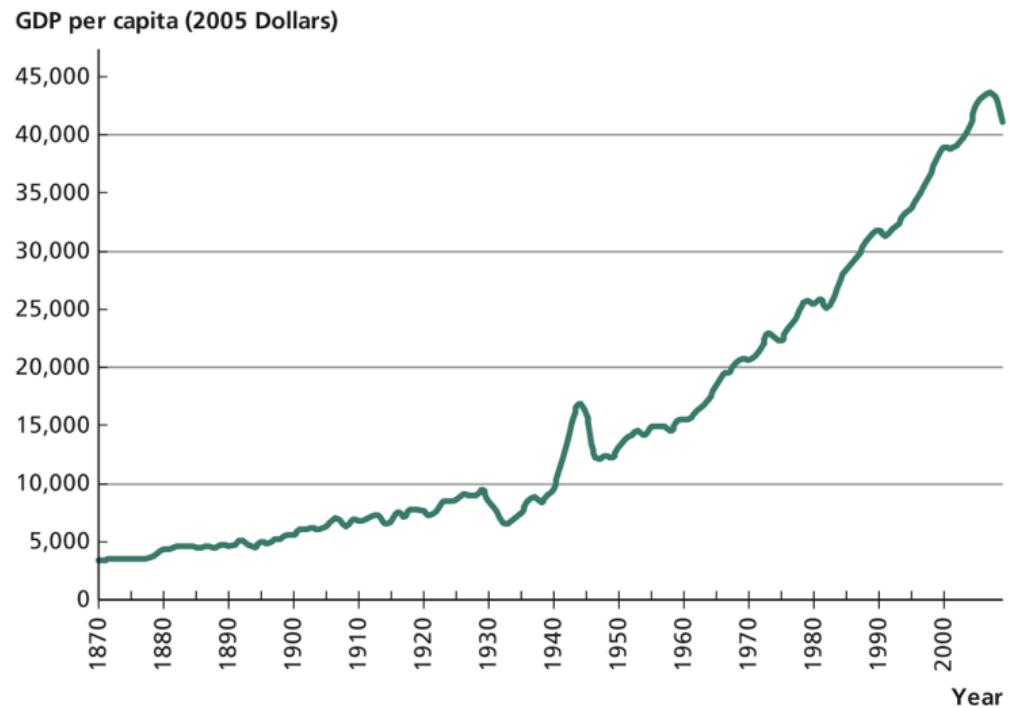
## Growth Miracles

Country	GDP per capita 2008	GDP per worker 2008	LF Part. Rate 2008	Avg. Growth 1960-2008	Years to Double
Hong Kong	37,834	70,940	0.53	4.3	16
Singapore	49,987	92,634	0.54	4.1	17
Taiwan	29,645	62,610	0.47	5.1	14
South Korea	25,539	50,988	0.50	4.5	16

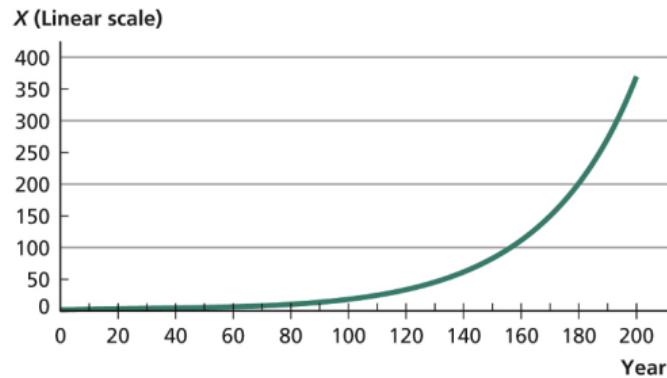
## Growth Disasters

Country	GDP per capita 2008	GDP per worker 2008	LF Part. Rate 2008	Avg. Growth 1960-2008	Years to Double
Venezuela	9,762	21,439	0.46	-0.1	
Haiti	1,403	3,164	0.44	-0.4	
Madagascar	810	1,656	0.49	-0.1	
Zimbabwe	135	343	0.40	-1.5	

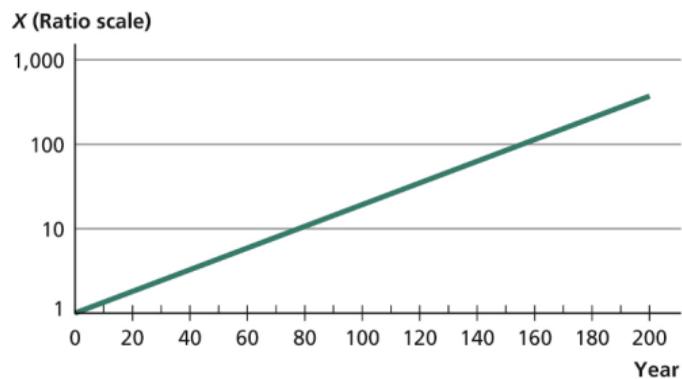
## GDP per capita in U.S. (1870-2009)



## Effect of Using a Ratio/Logarithmic Scale

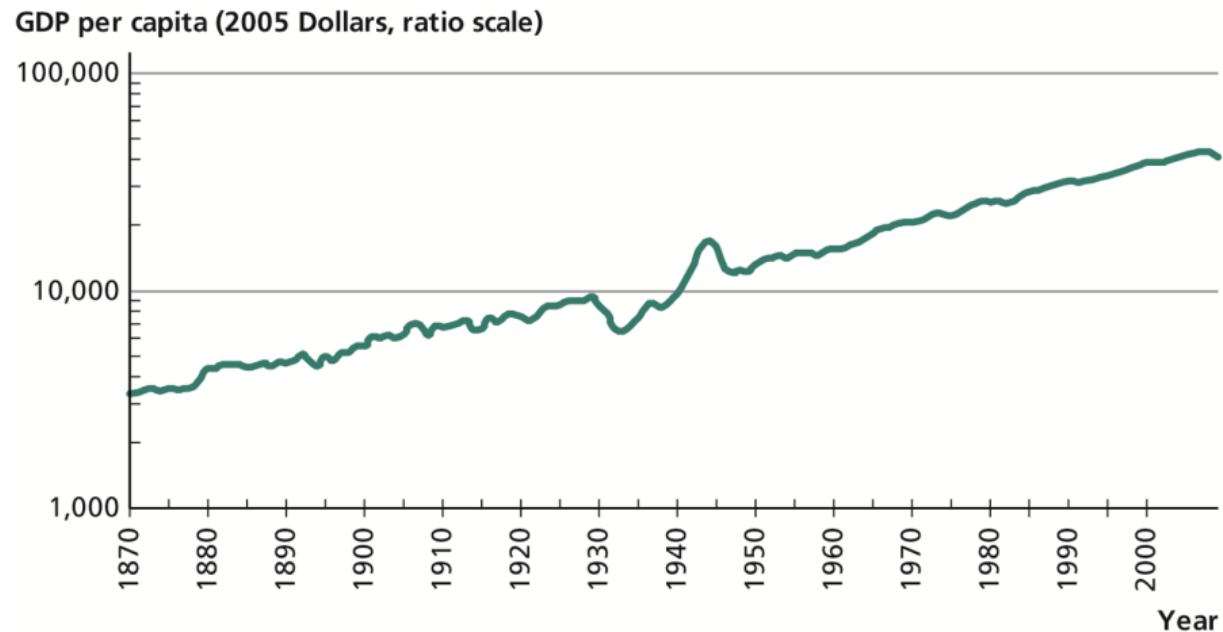


(a)  $X_t = X_0(1 + g)^t$

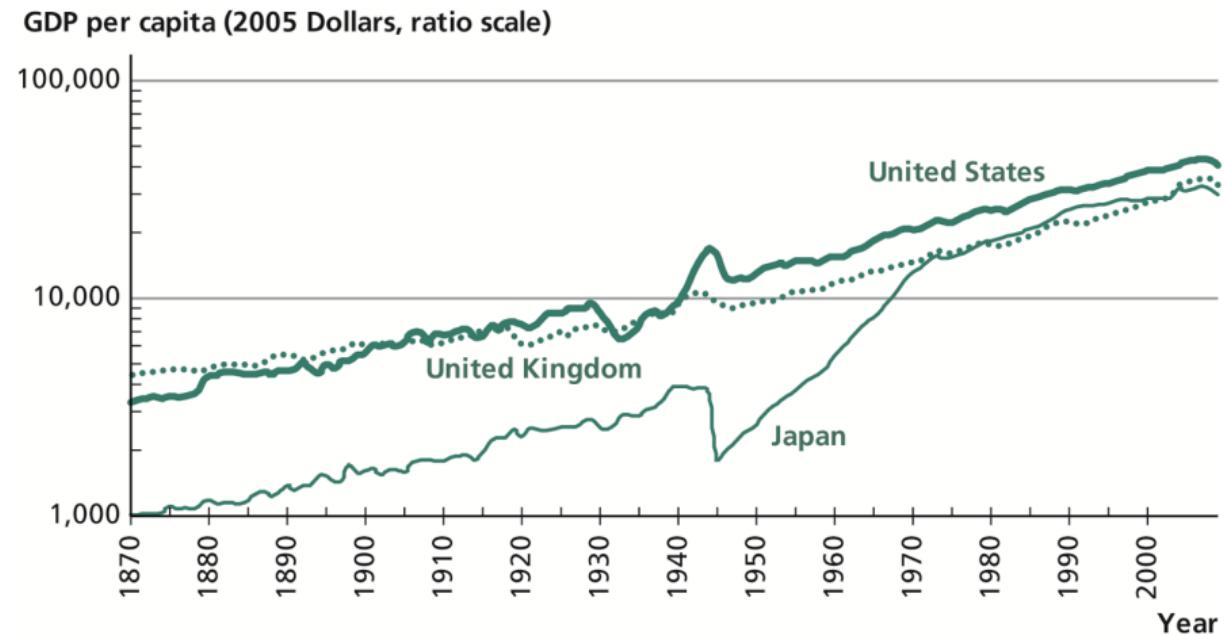


(b)  $\ln(X_t) = \ln(X_0) + (1 + g) \cdot t$

## GDP per capita in U.S. (1870-2009, Ratio Scale)



## GDP per capita in Japan, U.K., & U.S. (1870-2009, Ratio Scale)



Sources: Maddison (1995), Heston, Summers, And Aten (2011).

## What does this all suggest?

- Large differences in income per capita
- Smaller differences in growth rates of income per capita
- Constant and positive growth rates in the long-run
- Catch-up of poor to rich countries

## What does this all suggest?

- Large differences in income per capita
- Smaller differences in growth rates of income per capita
- Constant and positive growth rates in the long-run
- Catch-up of poor to rich countries

## What does this all suggest?

- Large differences in income per capita
- Smaller differences in growth rates of income per capita
- Constant and positive growth rates in the long-run
- Catch-up of poor to rich countries

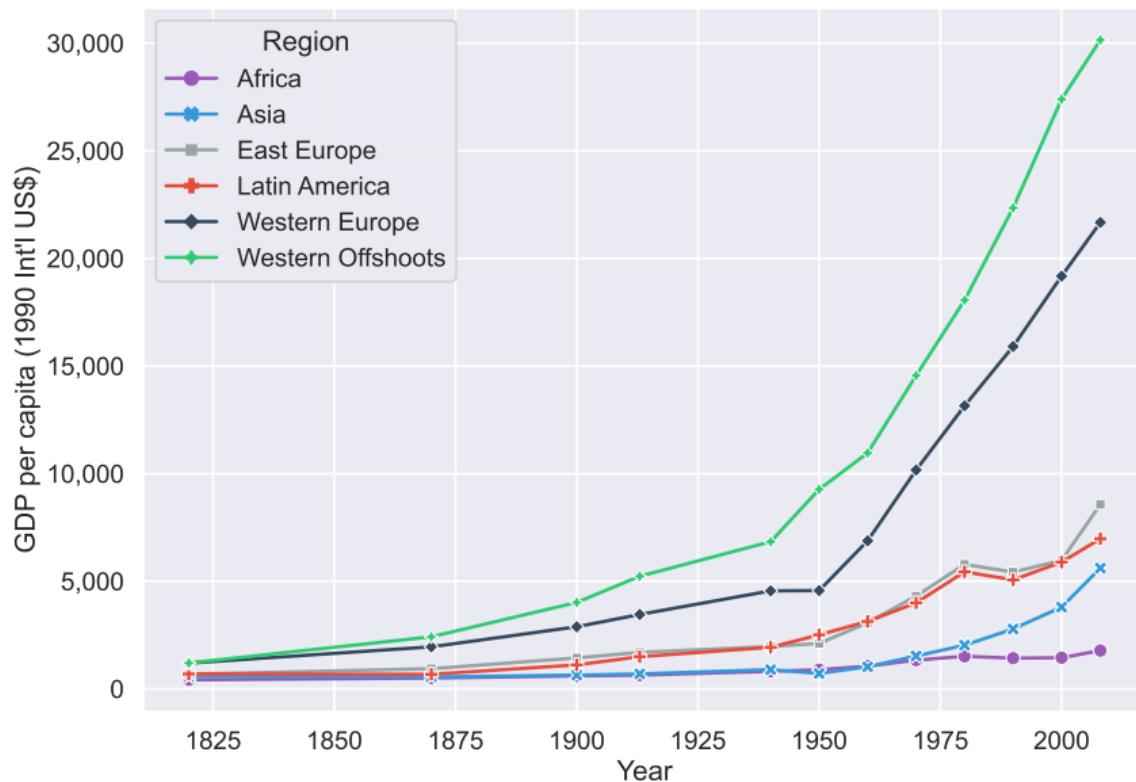
## What does this all suggest?

- Large differences in income per capita
- Smaller differences in growth rates of income per capita
- Constant and positive growth rates in the long-run
- Catch-up of poor to rich countries

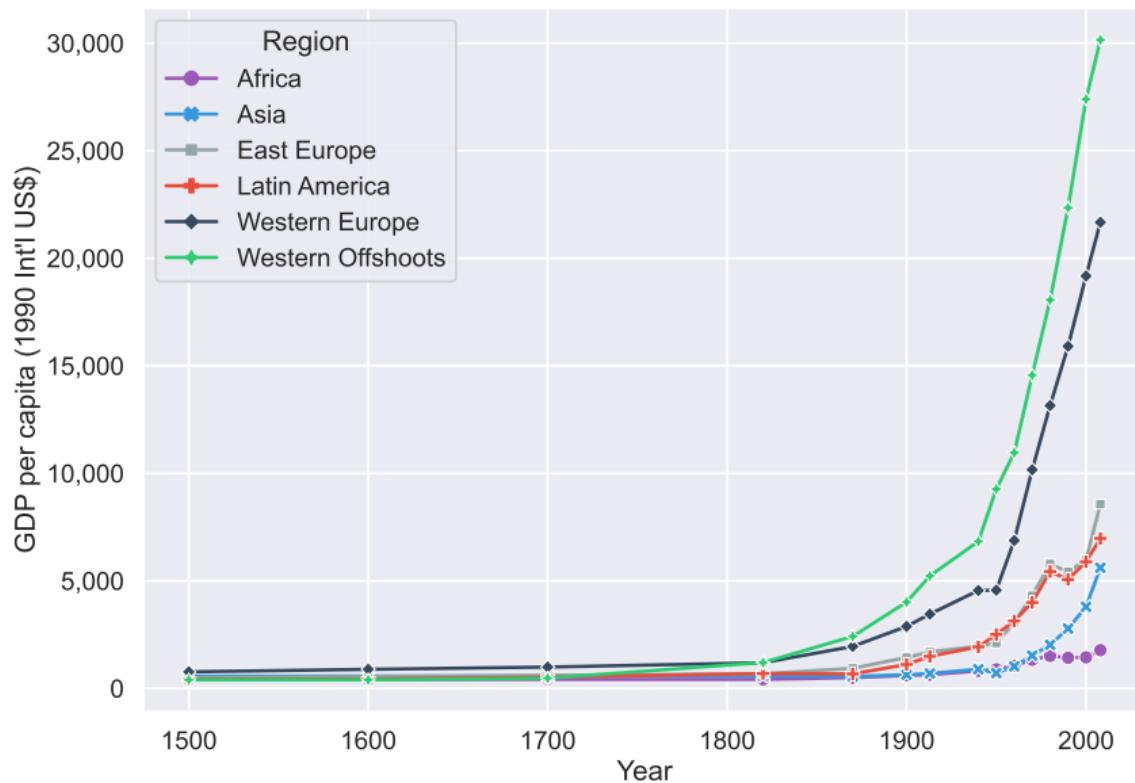
## Fact 3: Last 200 Years are Special

- Income differences were small/non-existent before 1800
- Growth rates were small  $\approx 0$  for most of human history

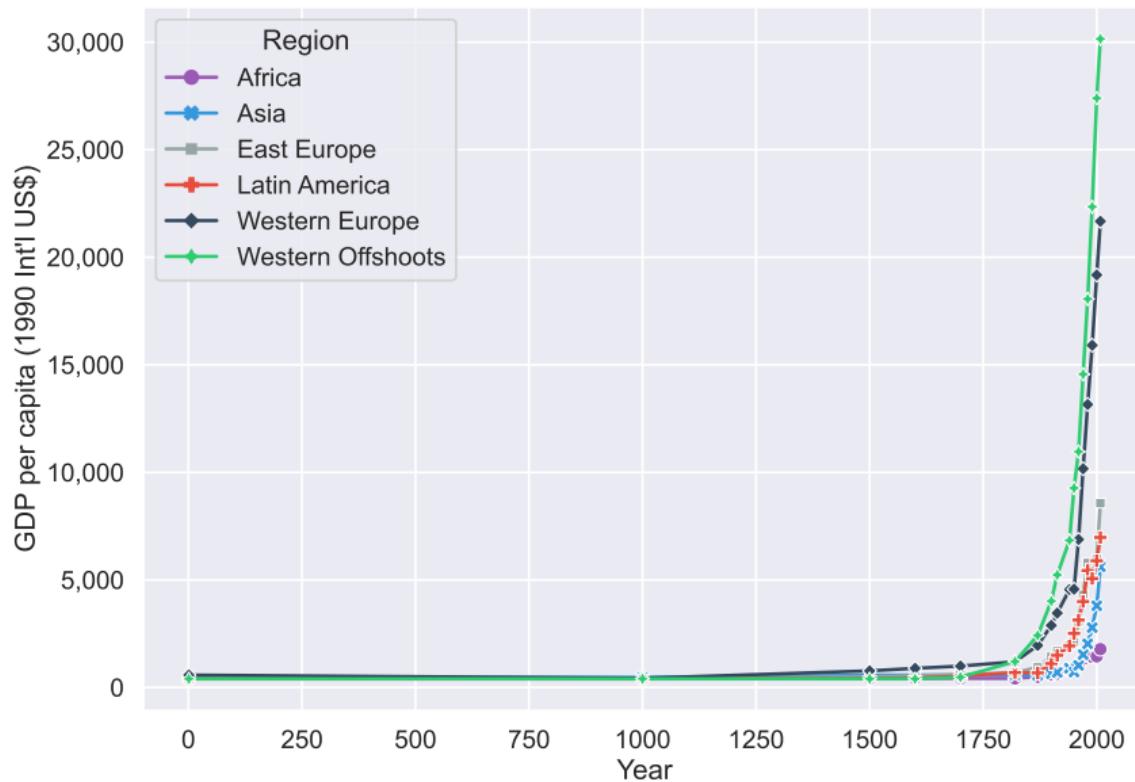
## Divergence across Regions: 1820–2010



## Divergence across Regions: 1500–2010



## Regional Income per Capita: 1–2010

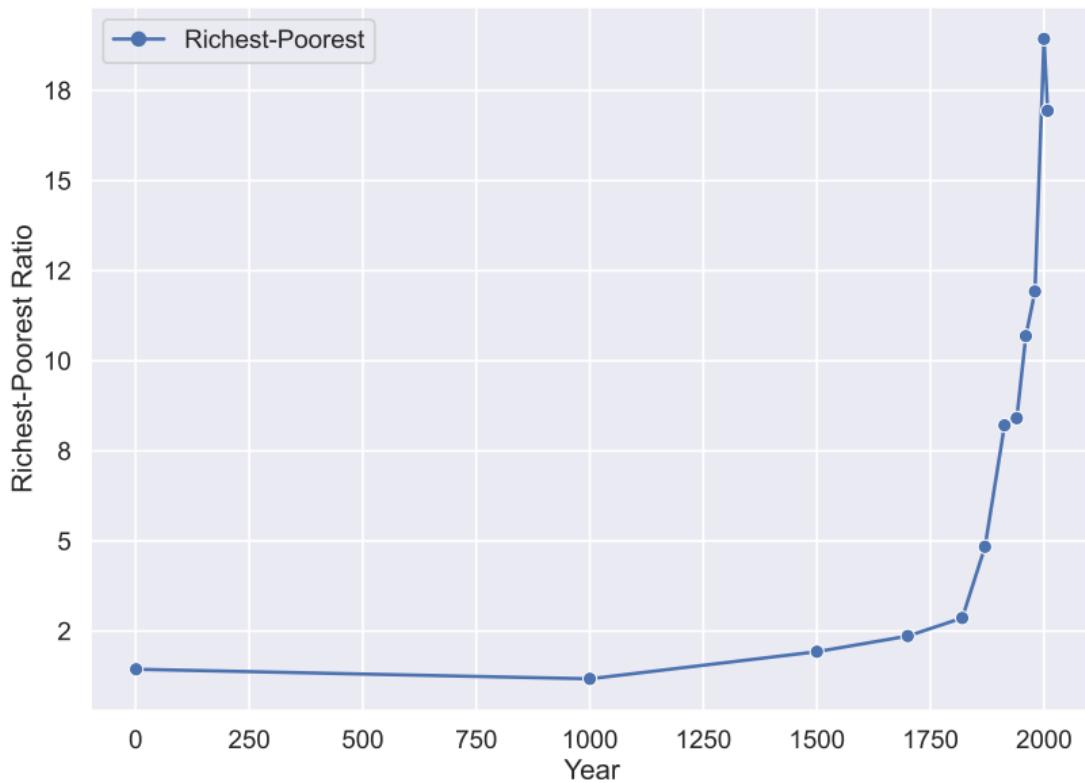


## Evolution of Inequality across Regions: 1–2010

	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 Neoclassical/Solow Growth Theory

- Diminishing returns to physical and human capital accumulation
- Diminishing effect of technological progress on productivity

## Inferences from Neoclassical/Solow Growth Theory

- Diminishing returns to physical and human capital accumulation
- Diminishing effect of technological progress on productivity

⇒ Reduction in inequality

⇒ Convergence

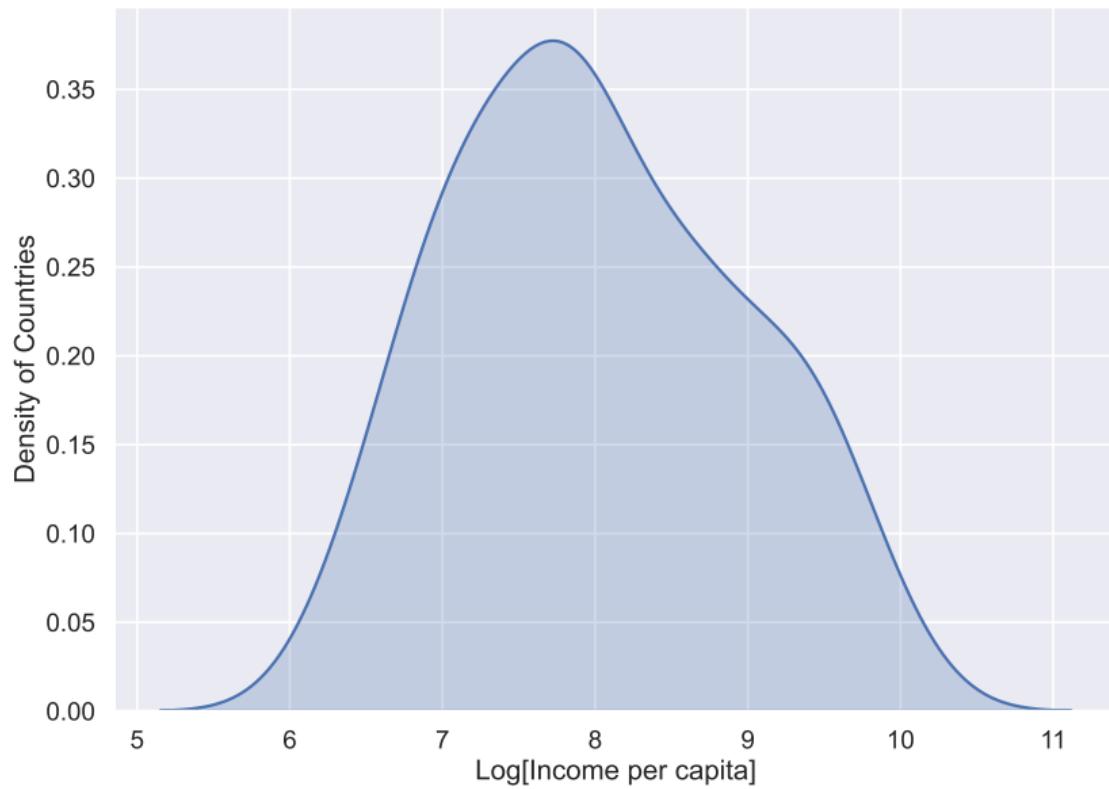
## Inferences from Neoclassical/Solow Growth Theory

- Diminishing returns to physical and human capital accumulation
  - Diminishing effect of technological progress on productivity
- ⇒ Reduction in inequality
- ⇒ Convergence

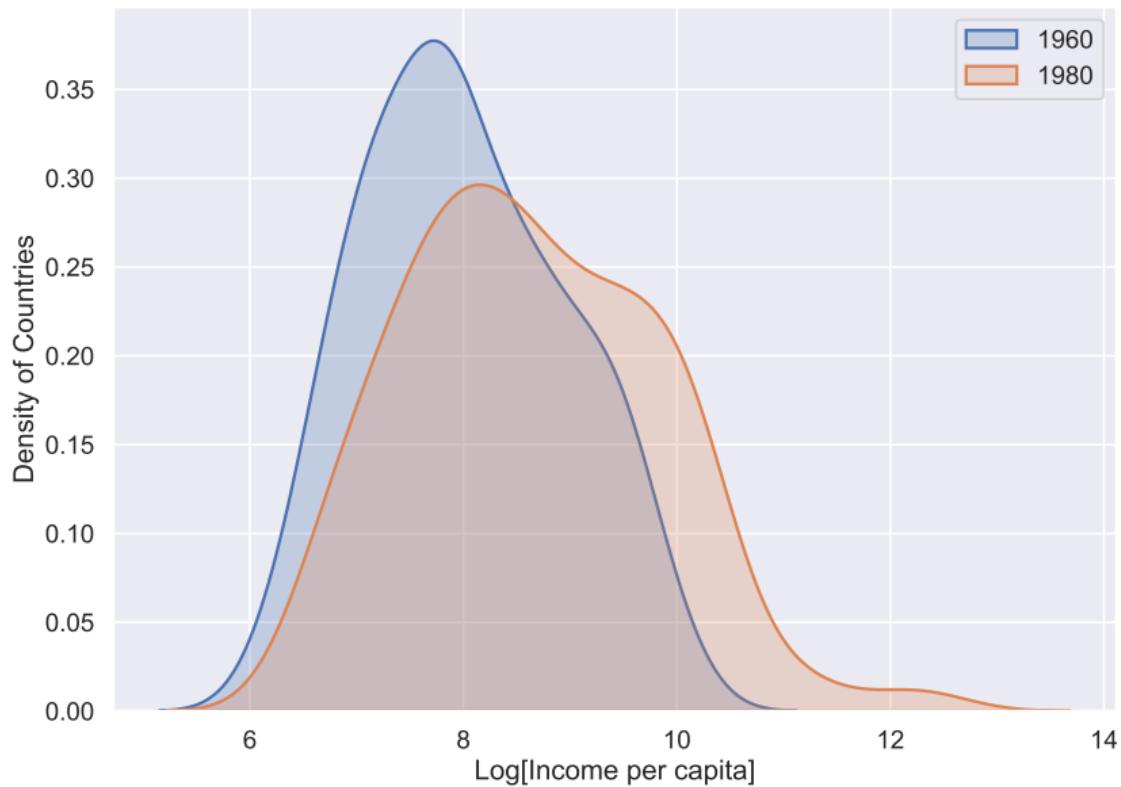
## Inferences from Neoclassical/Solow Growth Theory

- Diminishing returns to physical and human capital accumulation
- Diminishing effect of technological progress on productivity
  - ⇒ Reduction in inequality
  - ⇒ Convergence

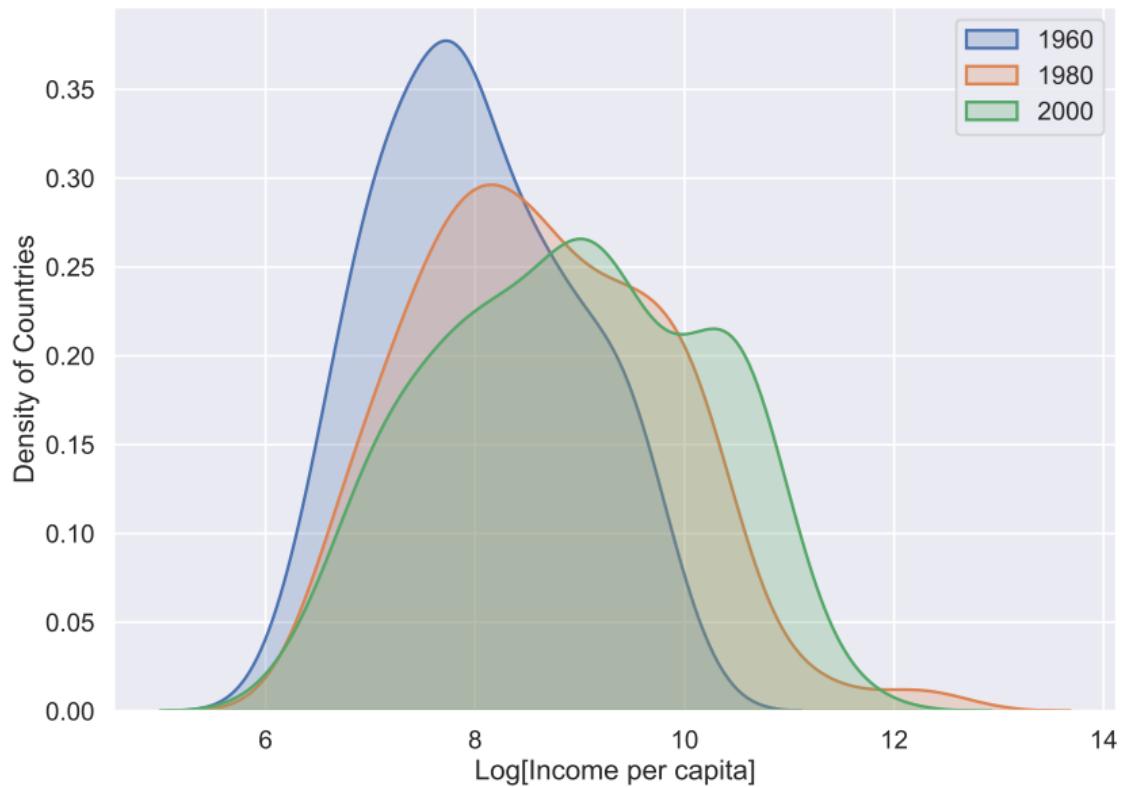
## Income Distribution in 1960



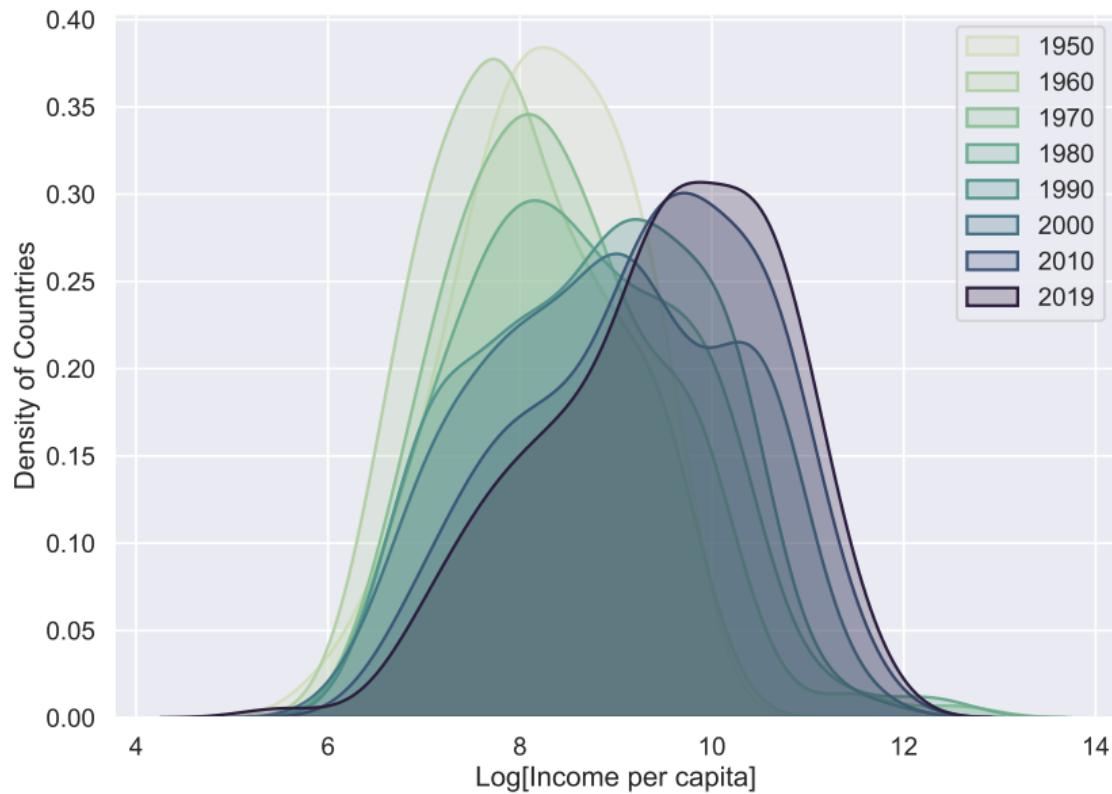
## Lack of Convergence across Nations: 1960–1980



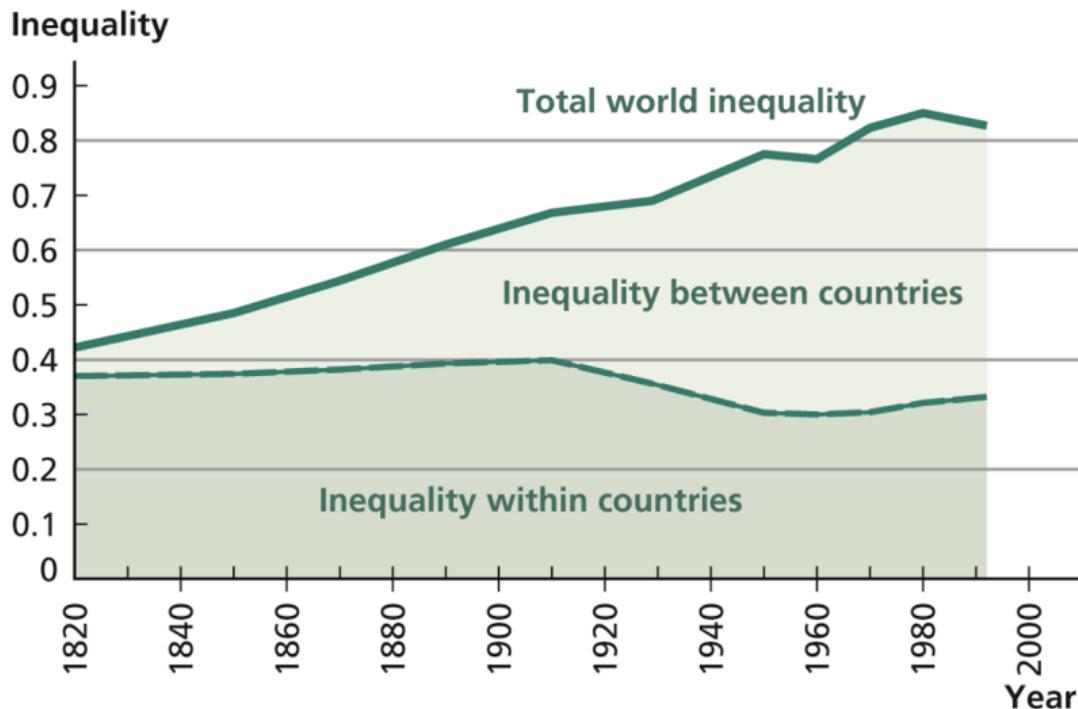
## Lack of Convergence across Nations: 1960–2000



## Lack of Convergence across Nations: 1950–2017

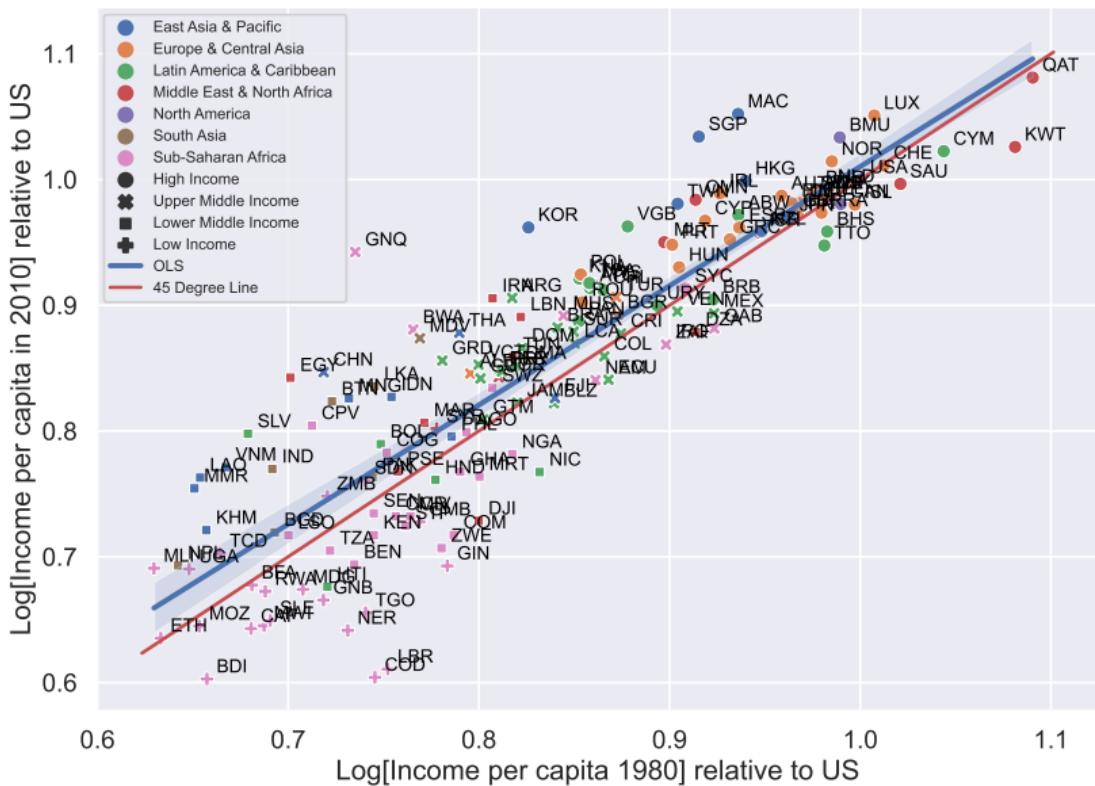


## World Inequality and Its Components



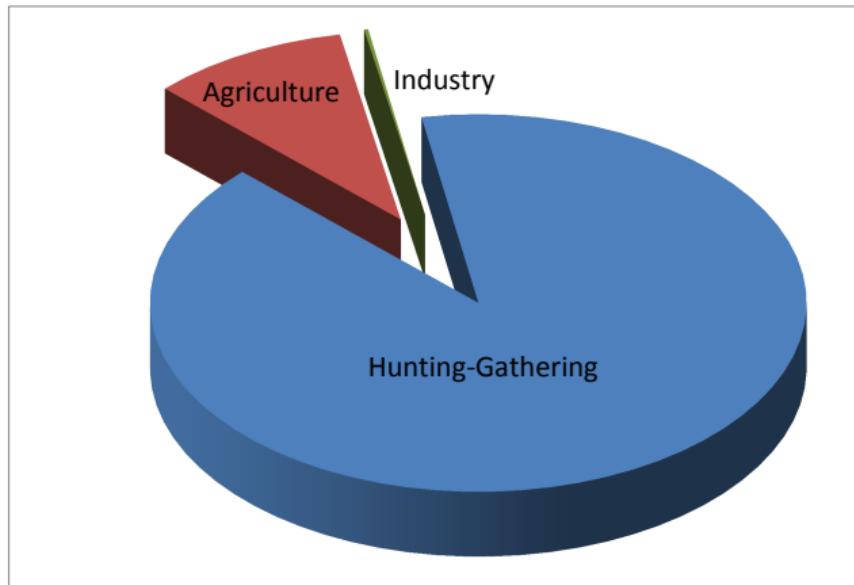
Source: Bourguignon and Morrison (2002).

# Persistent Inequality across Nations: 1980–2010



# Phases of Development

## Phases of Development: Modes of Production



## Phases of Development: Standard of Living

- The Malthusian Epoch
- The Post-Malthusian Regime
- The Modern Growth Regime

## Phases of Development: Standard of Living

- The Malthusian Epoch
- The Post-Malthusian Regime
- The Modern Growth Regime

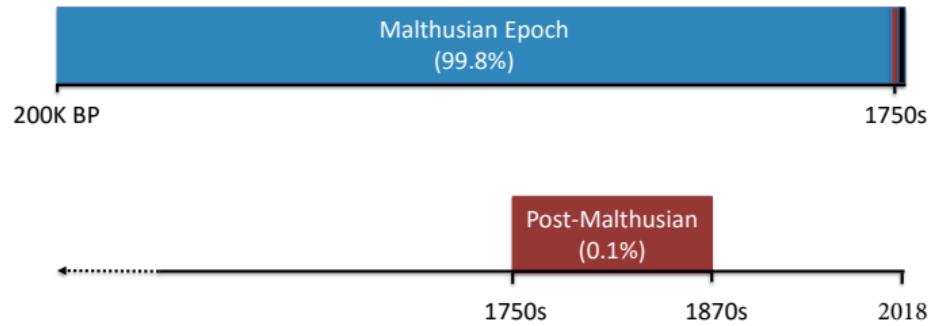
## Phases of Development: Standard of Living

- The Malthusian Epoch
- The Post-Malthusian Regime
- The Modern Growth Regime

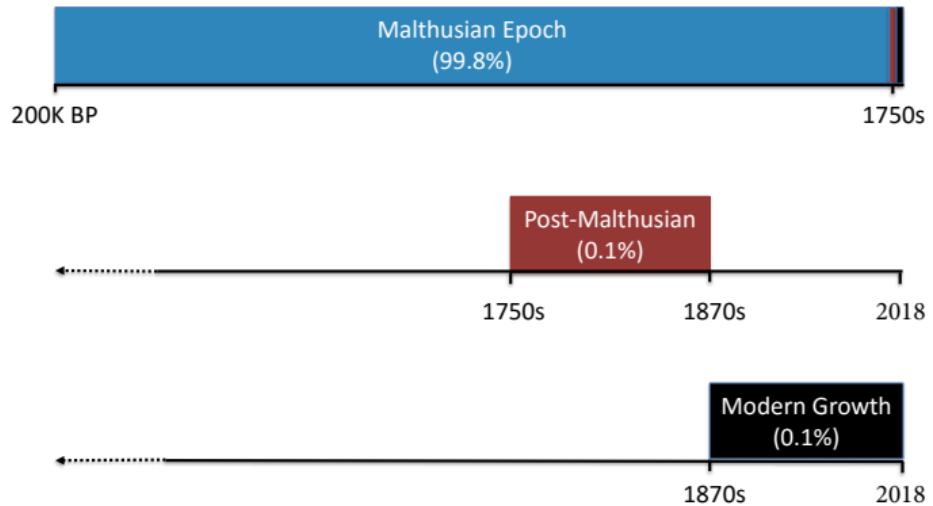
# Phases of Development: Timeline of the Most Developed Economies



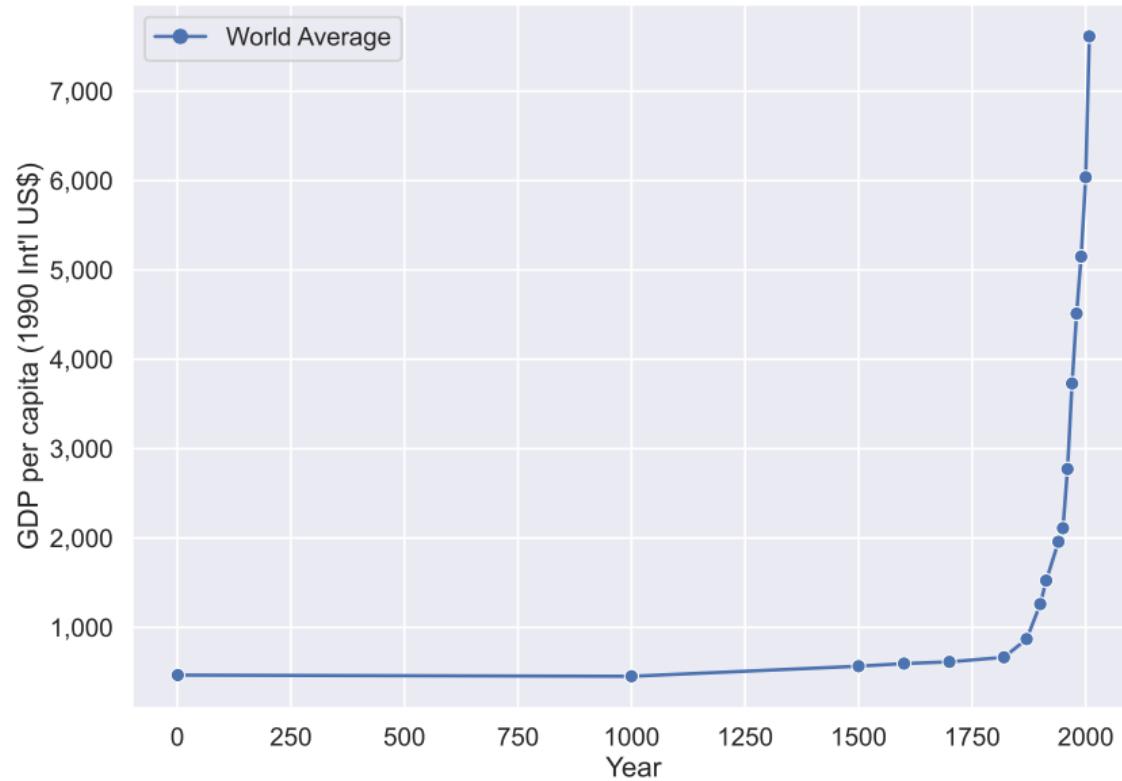
# Phases of Development: Timeline of the Most Developed Economies



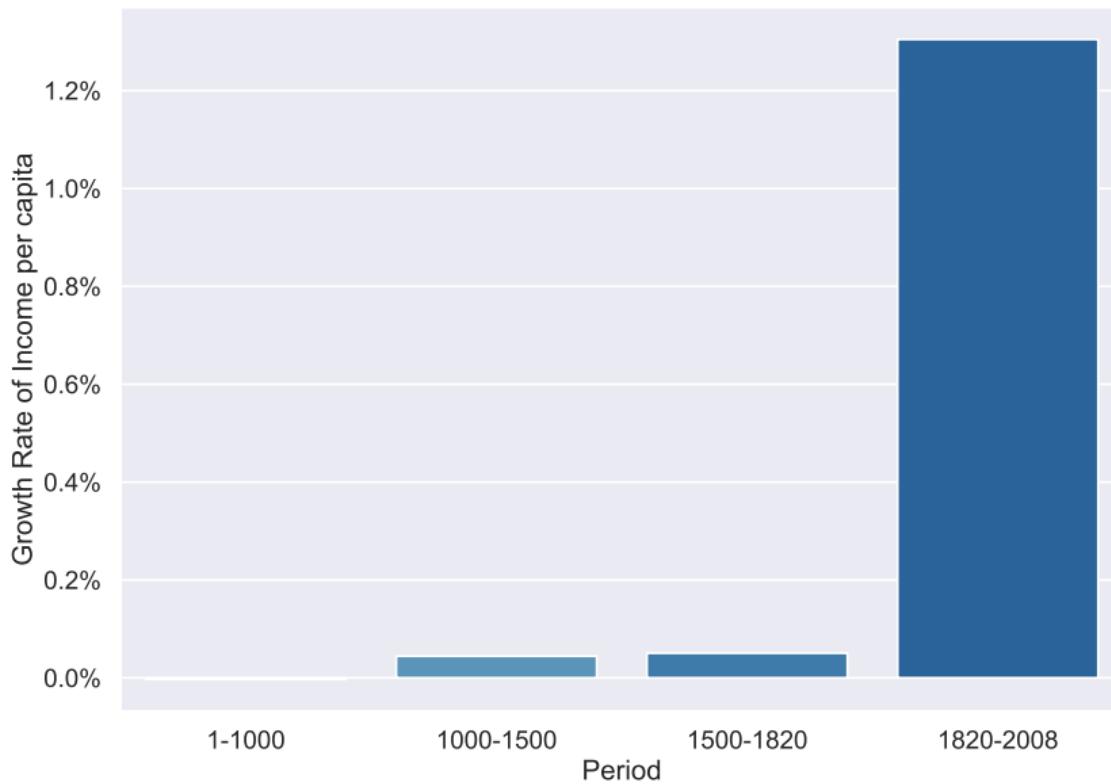
# Phases of Development: Timeline of the Most Developed Economies



## World Income per Capita: 1–2010



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



## The Malthusian Epoch

- Characterized by Malthusian dynamics and the absence of economic growth

- Central characteristics of the period:

• High population density  
• Limited land availability  
• Limited technological progress

- Technological progress over this period

• Irrigation  
• Crop rotation  
• Animal husbandry  
• Improved agricultural techniques

- Technologically advanced & land-rich economies:

• China  
• India  
• Persia  
• Ottoman Empire

## The Malthusian Epoch

- Characterized by Malthusian dynamics and the absence of economic growth
- Central characteristics of the period:
  - Positive effect of income on population growth
  - Diminishing returns to labor (reflecting the existence of fixed factor)
- Technological progress over this period

→ Agricultural improvements in Europe

→ Industrial revolution in Europe and North America

→ Technological progress in Japan and South Korea

- Technologically advanced & land-rich economies:

→ United States, Canada, Australia

→ Brazil, Argentina, Chile, Uruguay, Venezuela

## The Malthusian Epoch

- Characterized by Malthusian dynamics and the absence of economic growth
- Central characteristics of the period:
  - Positive effect of income on population growth
  - Diminishing returns to labor (reflecting the existence of fixed factor)
- Technological progress over this period

→ Agricultural revolution → Industrial revolution

→ Industrial revolution → Agricultural revolution

→ Agricultural revolution → Industrial revolution

- Technologically advanced & land-rich economies:

→ Industrial revolution

→ Industrial revolution → Agricultural revolution

## The Malthusian Epoch

- Characterized by Malthusian dynamics and the absence of economic growth
- Central characteristics of the period:
  - Positive effect of income on population growth
  - Diminishing returns to labor (reflecting the existence of fixed factor)
- Technological progress over this period

Technological progress was slow and did not increase output per capita.  
Technological progress was slow and did not increase output per capita.

- Technologically advanced & land-rich economies:

Highly developed agriculture  
Highly developed agriculture

## The Malthusian Epoch

- Characterized by Malthusian dynamics and the absence of economic growth
- Central characteristics of the period:
  - Positive effect of income on population growth
  - Diminishing returns to labor (reflecting the existence of fixed factor)
- Technological progress over this period
  - Increases income per capita in the short-run
  - Population adjust, as long as income remains above subsistence
  - Income per capita ultimately returns to its long-run level
- Technologically advanced & land-rich economies:
  - Industrialization
  - Capital accumulation
  - Technological innovation

## The Malthusian Epoch

- Characterized by Malthusian dynamics and the absence of economic growth
- Central characteristics of the period:
  - Positive effect of income on population growth
  - Diminishing returns to labor (reflecting the existence of fixed factor)
- Technological progress over this period
  - Increases income per capita in the short-run
    - Population adjust, as long as income remains above subsistence
    - Income per capita ultimately returns to its long-run level
  - Technologically advanced & land-rich economies:

Highly developed agriculture

Land abundant economies (e.g. US, Canada, Australia)

Highly developed agriculture

## The Malthusian Epoch

- Characterized by Malthusian dynamics and the absence of economic growth
- Central characteristics of the period:
  - Positive effect of income on population growth
  - Diminishing returns to labor (reflecting the existence of fixed factor)
- Technological progress over this period
  - Increases income per capita in the short-run
  - Population adjust, as long as income remains above subsistence
  - Income per capita ultimately returns to its long-run level
- Technologically advanced & land-rich economies:

Highly developed agriculture  
Land abundant relative to population  
Population density low

## The Malthusian Epoch

- Characterized by Malthusian dynamics and the absence of economic growth
- Central characteristics of the period:
  - Positive effect of income on population growth
  - Diminishing returns to labor (reflecting the existence of fixed factor)
- Technological progress over this period
  - Increases income per capita in the short-run
  - Population adjust, as long as income remains above subsistence
  - Income per capita ultimately returns to its long-run level
- Technologically advanced & land-rich economies:

Highly developed agriculture  
Land abundant relative to population  
Population density low

## The Malthusian Epoch

- Characterized by Malthusian dynamics and the absence of economic growth
- Central characteristics of the period:
  - Positive effect of income on population growth
  - Diminishing returns to labor (reflecting the existence of fixed factor)
- Technological progress over this period
  - Increases income per capita in the short-run
  - Population adjust, as long as income remains above subsistence
  - Income per capita ultimately returns to its long-run level
- Technologically advanced & land-rich economies:
  - Higher population density
  - Similar levels of income per-capita in the long-run

## The Malthusian Epoch

- Characterized by Malthusian dynamics and the absence of economic growth
- Central characteristics of the period:
  - Positive effect of income on population growth
  - Diminishing returns to labor (reflecting the existence of fixed factor)
- Technological progress over this period
  - Increases income per capita in the short-run
  - Population adjust, as long as income remains above subsistence
  - Income per capita ultimately returns to its long-run level
- Technologically advanced & land-rich economies:
  - Higher population density
  - Similar levels of income per-capita in the long-run

## The Malthusian Epoch

- Characterized by Malthusian dynamics and the absence of economic growth
- Central characteristics of the period:
  - Positive effect of income on population growth
  - Diminishing returns to labor (reflecting the existence of fixed factor)
- Technological progress over this period
  - Increases income per capita in the short-run
  - Population adjust, as long as income remains above subsistence
  - Income per capita ultimately returns to its long-run level
- Technologically advanced & land-rich economies:
  - Higher population density
  - Similar levels of income per-capita in the long-run

## Malthusian Dynamics - Prominent Examples

- The dynamics of Irish economy (1650 - 1850)
  - Triggered by the cultivation of a new world crop – potato
- The dynamics of the Chinese Economy (1500 - 1800)
  - Triggered by the cultivation of rice
- The dynamics of the English economy (1348 - 1700)
  - Triggered by the Black Death

## Malthusian Dynamics - Prominent Examples

- The dynamics of Irish economy (1650 - 1850)
  - Triggered by the cultivation of a new world crop – potato
- The dynamics of the Chinese Economy (1500 - 1800)
  - Triggered by the introduction of the compass
- The dynamics of the English economy (1348 - 1700)
  - Triggered by the Black Death

## Malthusian Dynamics - Prominent Examples

- The dynamics of Irish economy (1650 - 1850)
  - Triggered by the cultivation of a new world crop – potato
- The dynamics of the Chinese Economy (1500 - 1800)
  - Triggered by superior agricultural technology
- The dynamics of the English economy (1348 - 1700)
  - Triggered by the Black Death

## Malthusian Dynamics - Prominent Examples

- The dynamics of Irish economy (1650 - 1850)
  - Triggered by the cultivation of a new world crop – potato
- The dynamics of the Chinese Economy (1500 - 1800)
  - Triggered by superior agricultural technology
- The dynamics of the English economy (1348 - 1700)
  - Triggered by the Black Death

## Malthusian Dynamics - Prominent Examples

- The dynamics of Irish economy (1650 - 1850)
  - Triggered by the cultivation of a new world crop – potato
- The dynamics of the Chinese Economy (1500 - 1800)
  - Triggered by superior agricultural technology
- The dynamics of the English economy (1348 - 1700)
  - Triggered by the Black Death

## Malthusian Dynamics - Prominent Examples

- The dynamics of Irish economy (1650 - 1850)
  - Triggered by the cultivation of a new world crop – potato
- The dynamics of the Chinese Economy (1500 - 1800)
  - Triggered by superior agricultural technology
- The dynamics of the English economy (1348 - 1700)
  - Triggered by the Black Death

## Malthusian Dynamics - Ireland (1650 - 1850)

- The Columbian Exchange  $\Rightarrow$  massive cultivation of potato post-1650

- 1650-1840s

Massive increase in population  
from 1 million to 8 million

- 1845-1852 Potato blight destroys crops  $\Rightarrow$  Great Famine

Massive increase in mortality  
from 1 million to 2 million

## Malthusian Dynamics - Ireland (1650 - 1850)

- The Columbian Exchange  $\Rightarrow$  massive cultivation of potato post-1650
  - 1650-1840s
    - Population increases from 2 to 6 million
    - Income per capita increases only very modestly
  - 1845-1852 Potato blight destroys crops  $\Rightarrow$  Great Famine

Population growth in Ireland  
from 1650 to 1850

## Malthusian Dynamics - Ireland (1650 - 1850)

- The Columbian Exchange  $\Rightarrow$  massive cultivation of potato post-1650
  - 1650-1840s
    - Population increases from 2 to 6 million
    - Income per capita increases only very modestly
  - 1845-1852 Potato blight destroys crops  $\Rightarrow$  Great Famine

Population growth in Ireland between 1650 and 1850

Population growth in Ireland between 1650 and 1850

## Malthusian Dynamics - Ireland (1650 - 1850)

- The Columbian Exchange  $\Rightarrow$  massive cultivation of potato post-1650
  - 1650-1840s
    - Population increases from 2 to 6 million
    - Income per capita increases only very modestly
  - 1845-1852 Potato blight destroys crops  $\Rightarrow$  Great Famine

## Malthusian Dynamics - Ireland (1650 - 1850)

- The Columbian Exchange  $\Rightarrow$  massive cultivation of potato post-1650
  - 1650-1840s
    - Population increases from 2 to 6 million
    - Income per capita increases only very modestly
  - 1845-1852 Potato blight destroys crops  $\Rightarrow$  Great Famine
    - Population decreases by about 2 million
    - (1M Famine death & 1M emigration to the New World)

## Malthusian Dynamics - Ireland (1650 - 1850)

- The Columbian Exchange  $\Rightarrow$  massive cultivation of potato post-1650
  - 1650-1840s
    - Population increases from 2 to 6 million
    - Income per capita increases only very modestly
  - 1845-1852 Potato blight destroys crops  $\Rightarrow$  Great Famine
    - Population decreases by about 2 million
    - (1M Famine death & 1M emigration to the New World)

## Malthusian Dynamics - Ireland (1650 - 1850)

- The Columbian Exchange  $\Rightarrow$  massive cultivation of potato post-1650
  - 1650-1840s
    - Population increases from 2 to 6 million
    - Income per capita increases only very modestly
  - 1845-1852 Potato blight destroys crops  $\Rightarrow$  Great Famine
    - Population decreases by about 2 million
    - (1M Famine death & 1M emigration to the New World)

## Malthusian Dynamics - China (1500 - 1800)

- Superior agricultural technology
  - 1500-1820



## Malthusian Dynamics - China (1500 - 1800)

- Superior agricultural technology
  - 1500-1820
    - Population increases from 103 to 381 million
    - Share of China in world population to increase from 23% to 37%
    - Income per capita was steady at \$600

## Malthusian Dynamics - China (1500 - 1800)

- Superior agricultural technology
- 1500-1820
  - Population increases from 103 to 381 million
  - Share of China in world population to increase from 23% to 37%
  - Income per capita was steady at \$600

## Malthusian Dynamics - China (1500 - 1800)

- Superior agricultural technology
- 1500-1820
  - Population increases from 103 to 381 million
  - Share of China in world population to increase from 23% to 37%
  - Income per capita was steady at \$600

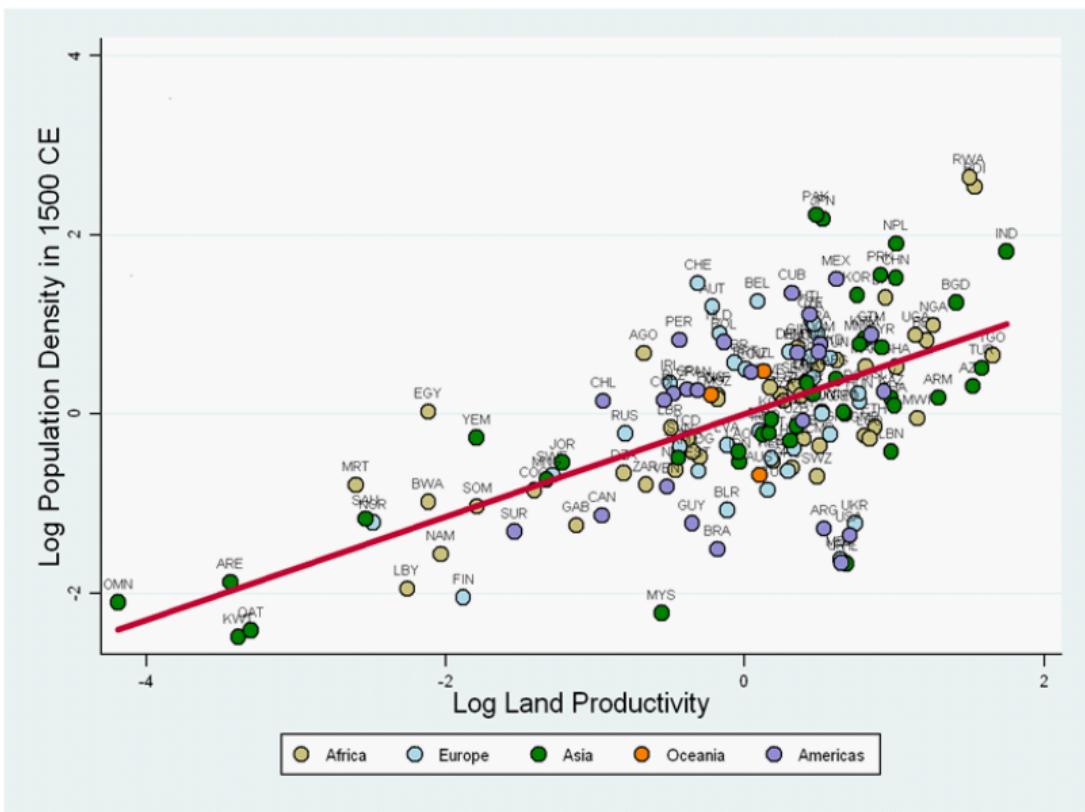
## Malthusian Dynamics - China (1500 - 1800)

- Superior agricultural technology
- 1500-1820
  - Population increases from 103 to 381 million
  - Share of China in world population to increase from 23% to 37%
  - Income per capita was steady at \$600

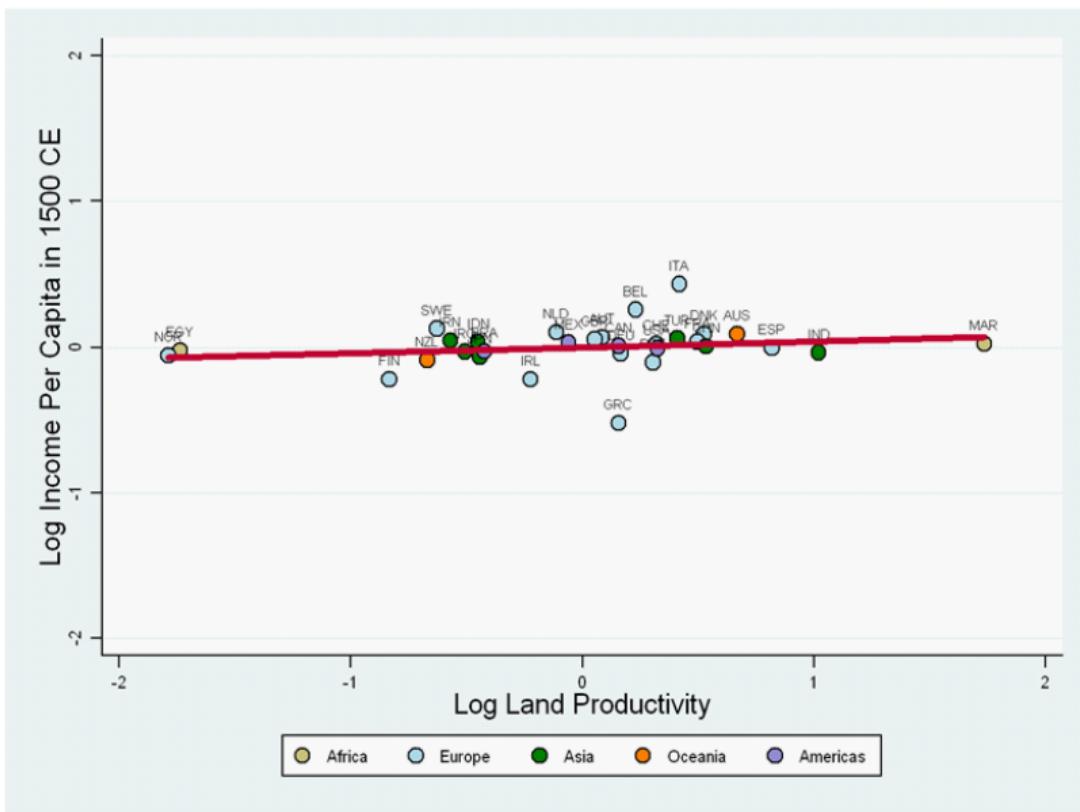
## Malthusian Adjustments to the Black Death: England, 1348–1750



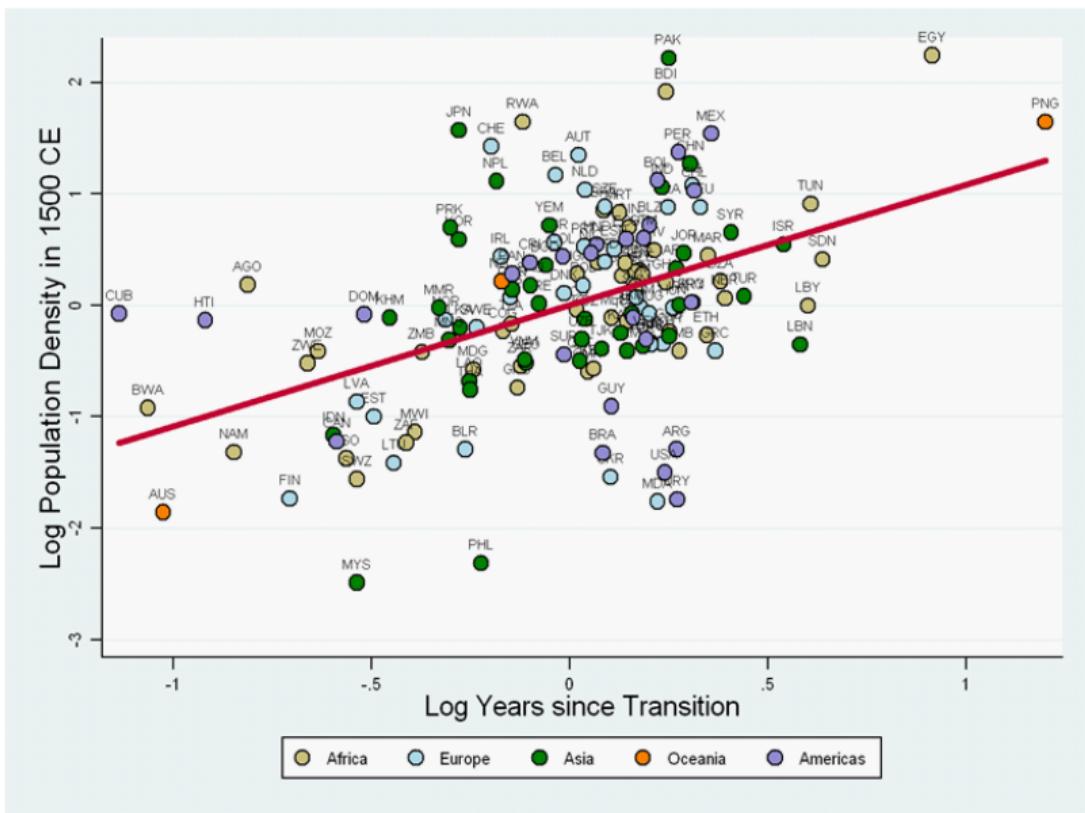
## Land Productivity and Population Density in 1500



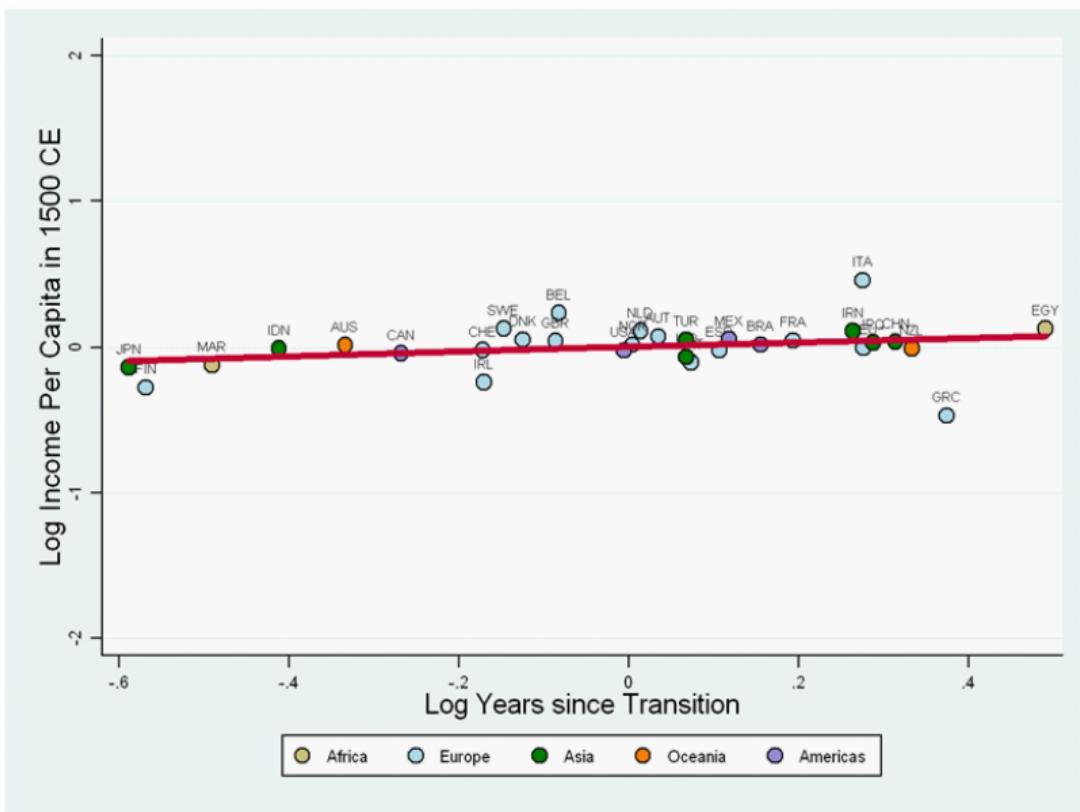
## Land Productivity and Income per Capita in 1500



# Technology and Population Density in 1500



## Technology and Income per Capita in 1500



## The Post-Malthusian Regime

- Characterized by the onset of economic growth:
  - Technological progress accelerates
  - Income per capita still has a positive effect on population growth
  - Technological progress:
    - Population growth slows down
    - Income per capita increases rapidly

## The Post-Malthusian Regime

- Characterized by the onset of economic growth:
  - Technological progress accelerates
  - Income per capita still has a positive effect on population growth
  - Technological progress:
    - Population growth slows down
    - Income per capita increases

## The Post-Malthusian Regime

- Characterized by the onset of economic growth:
  - Technological progress accelerates
  - Income per capita still has a positive effect on population growth
  - Technological progress:

Technological progress  
Income per capita

## The Post-Malthusian Regime

- Characterized by the onset of economic growth:
  - Technological progress accelerates
  - Income per capita still has a positive effect on population growth
  - Technological progress:
    - Increases output more than population
    - $\Rightarrow$  growth in income per capita

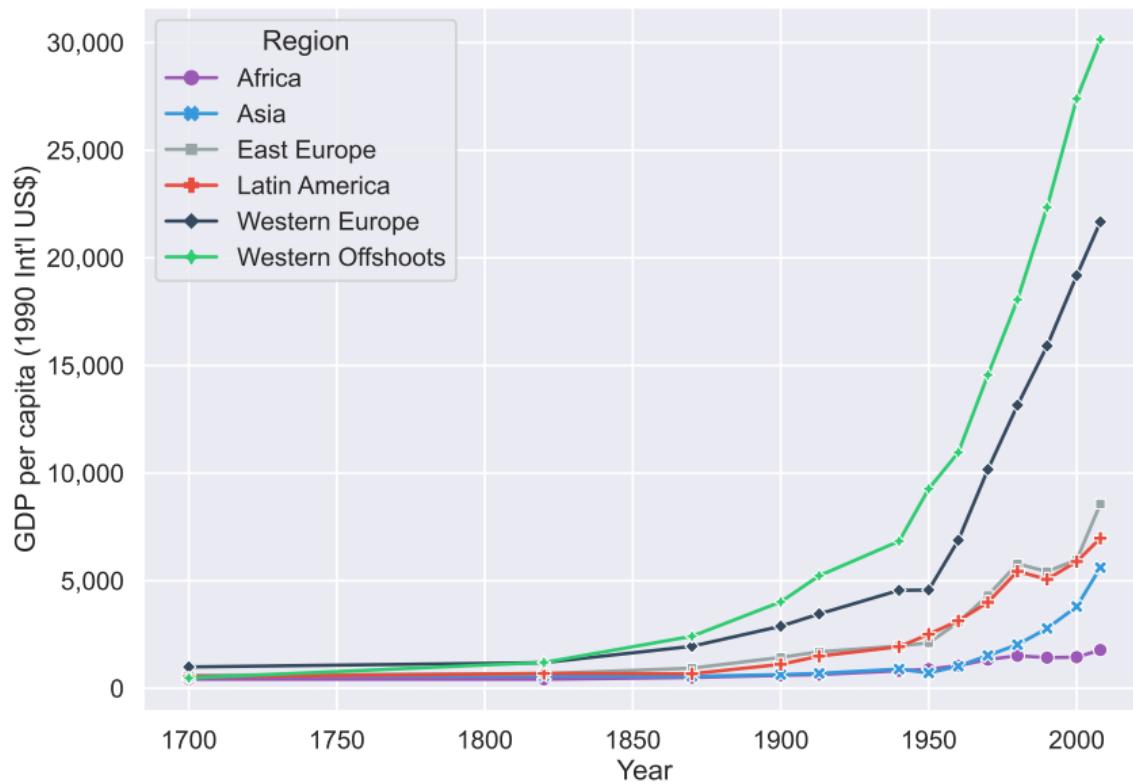
## The Post-Malthusian Regime

- Characterized by the onset of economic growth:
  - Technological progress accelerates
  - Income per capita still has a positive effect on population growth
  - Technological progress:
    - Increases output more than population
    - $\Rightarrow$  growth in income per capita

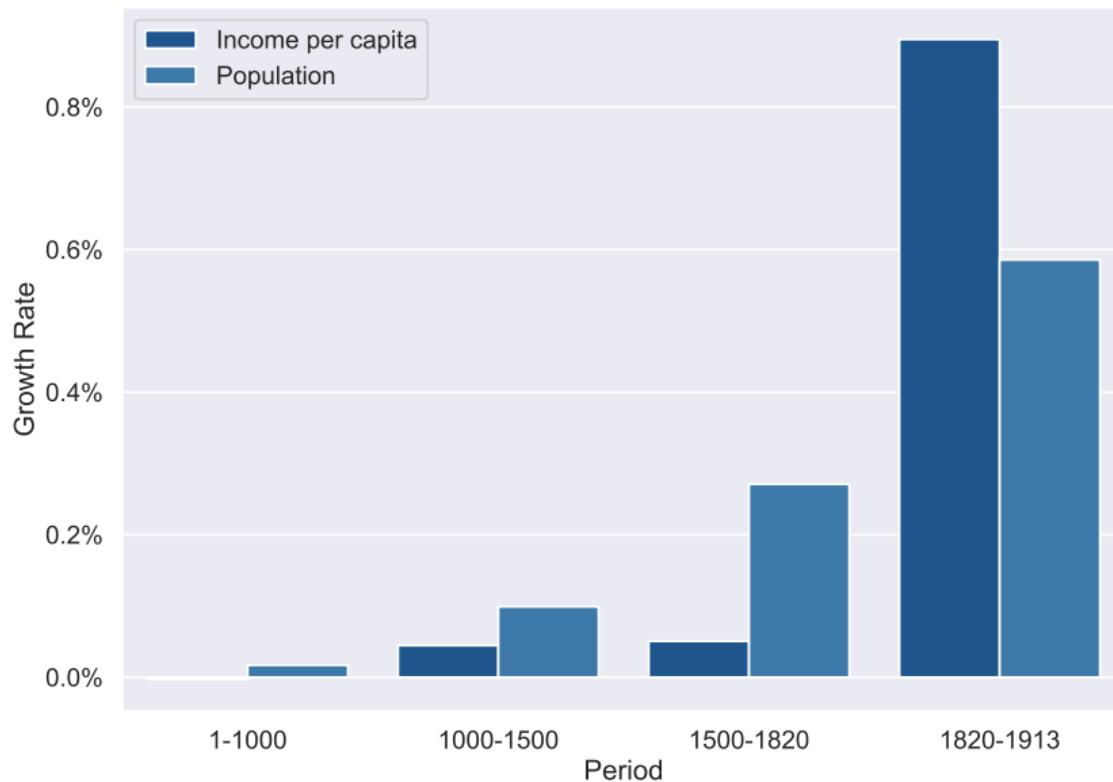
## The Post-Malthusian Regime

- Characterized by the onset of economic growth:
  - Technological progress accelerates
  - Income per capita still has a positive effect on population growth
  - Technological progress:
    - Increases output more than population
    - $\Rightarrow$  growth in income per capita

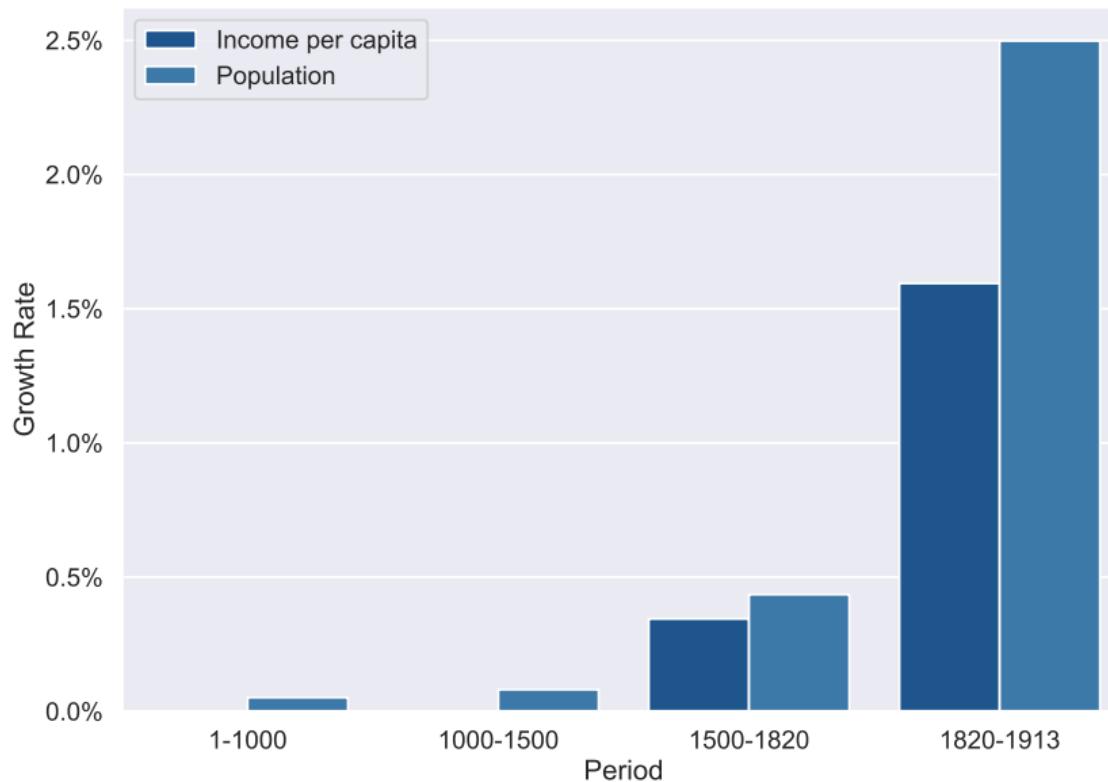
## Regional Variation in the Timing of the Take-off



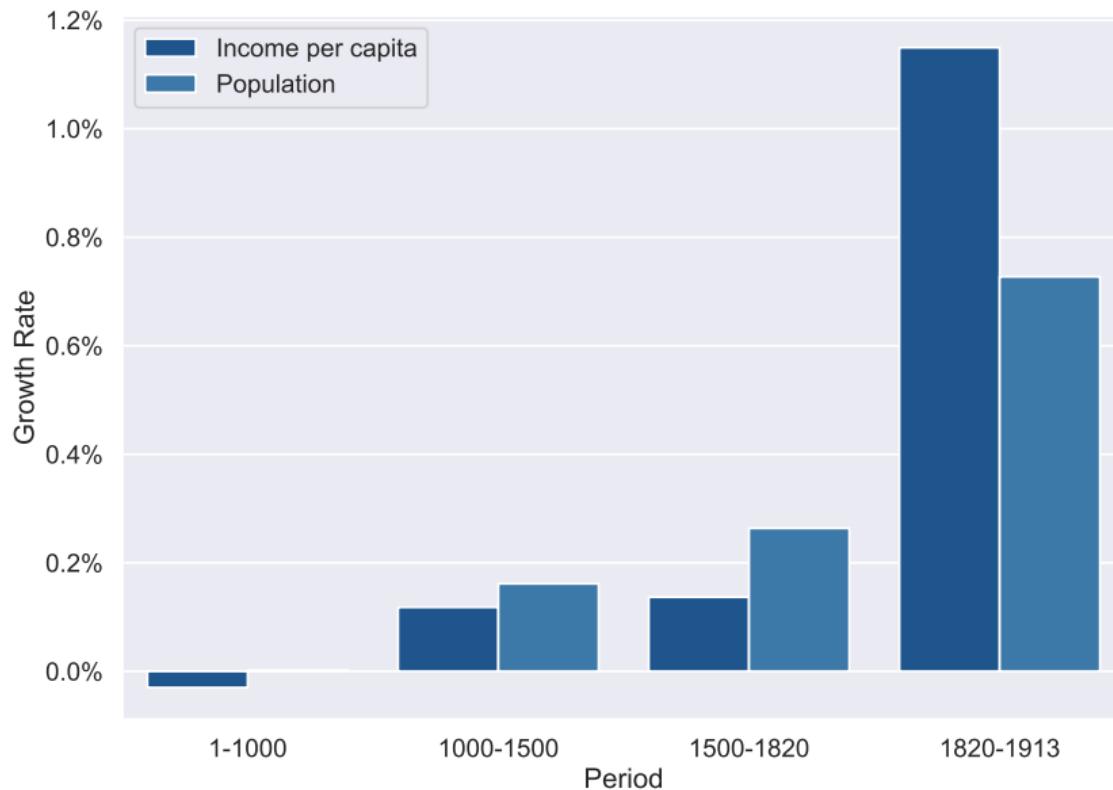
## Take-off: Growth of Population & Income per Capita – World



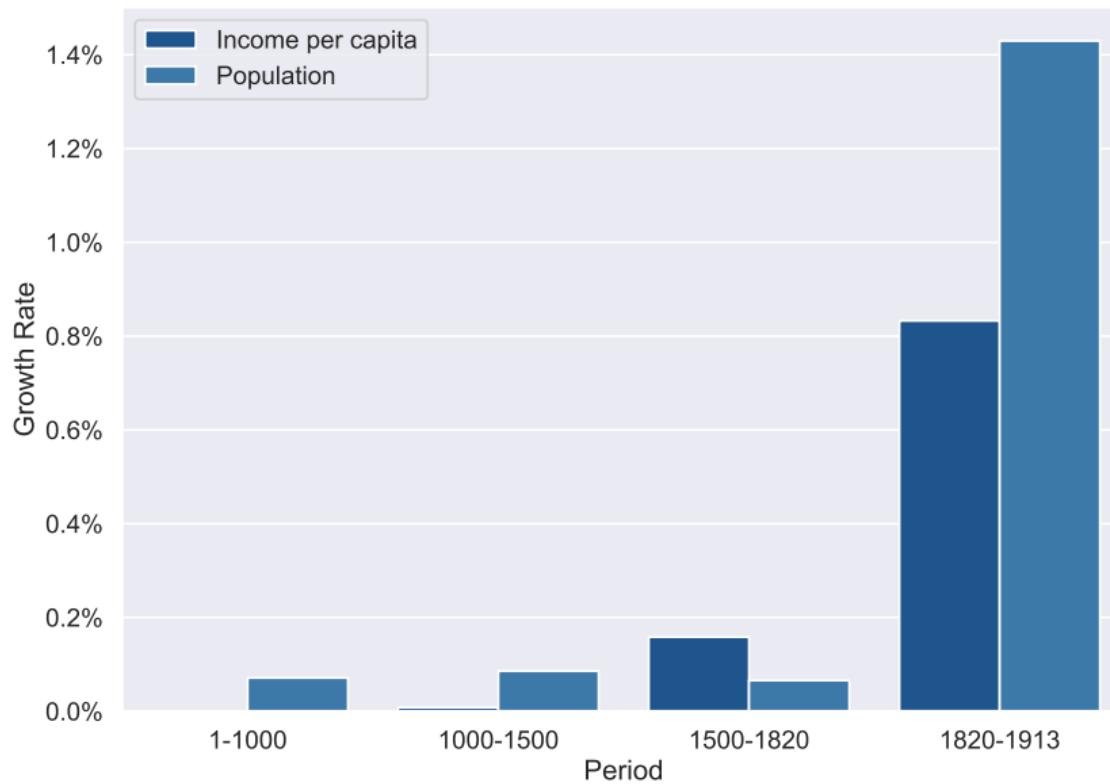
## Take-off: Growth of Population & Income per Capita – Western Offshoots



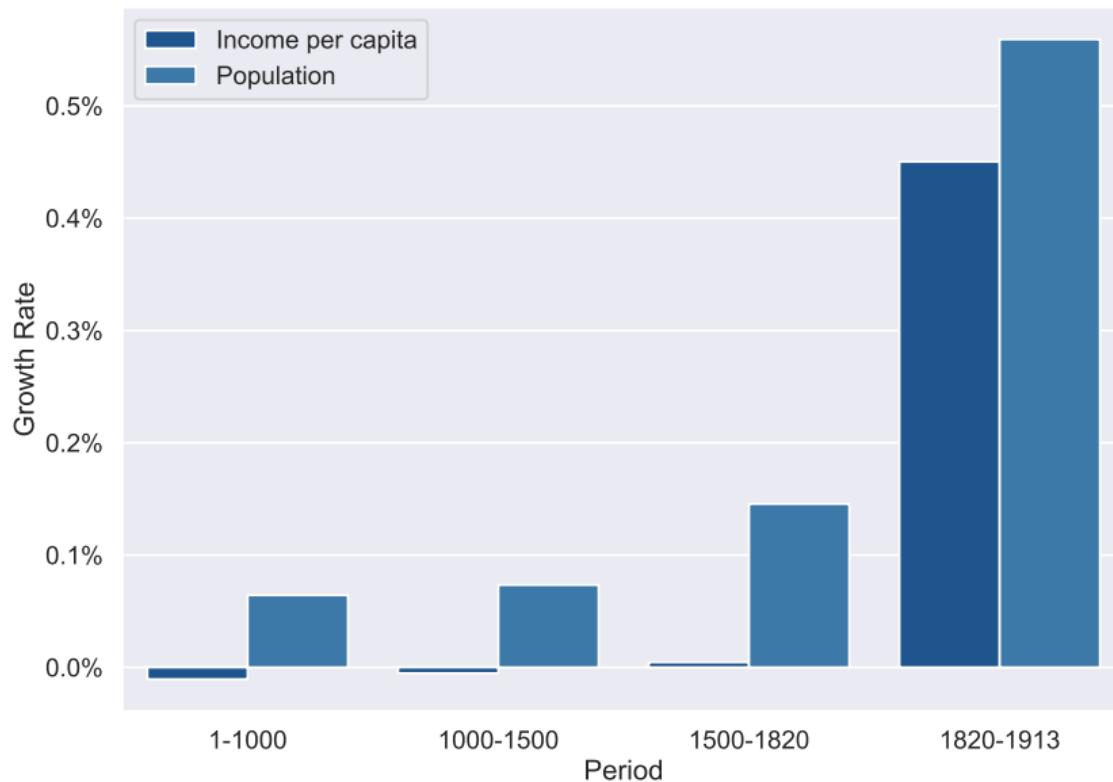
## Take-off: Growth of Population & Income per Capita – Western Europe



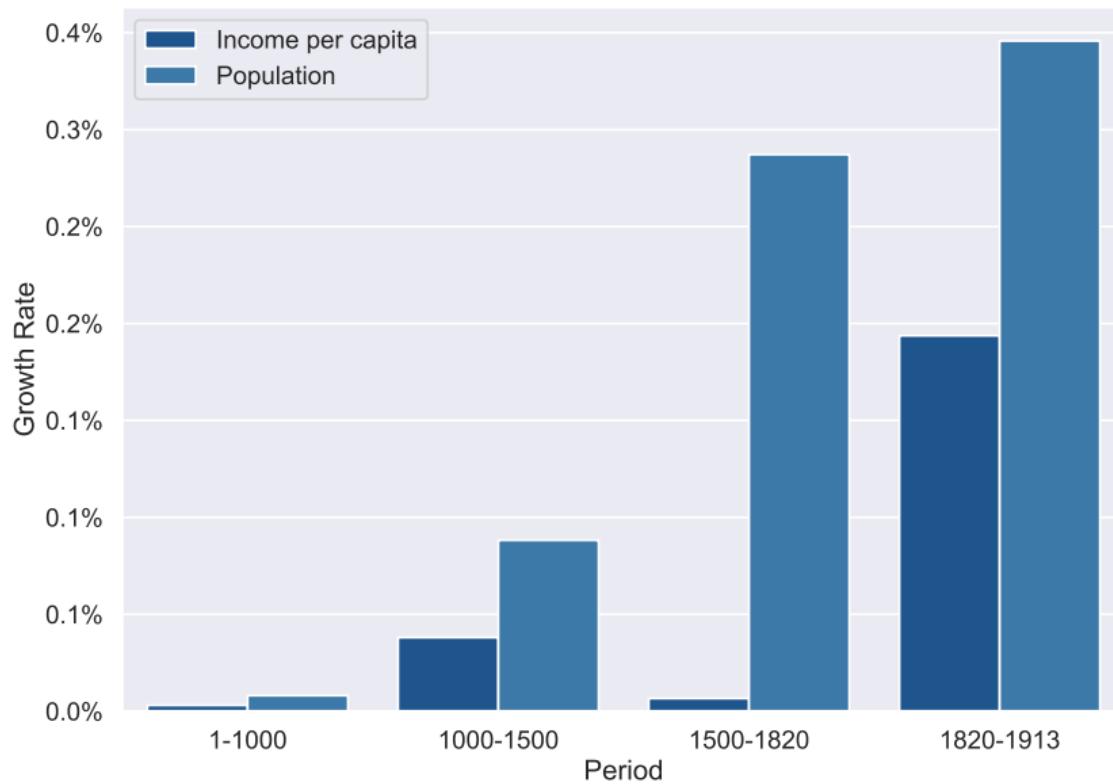
## Take-off: Growth of Population & Income per Capita – Latin America



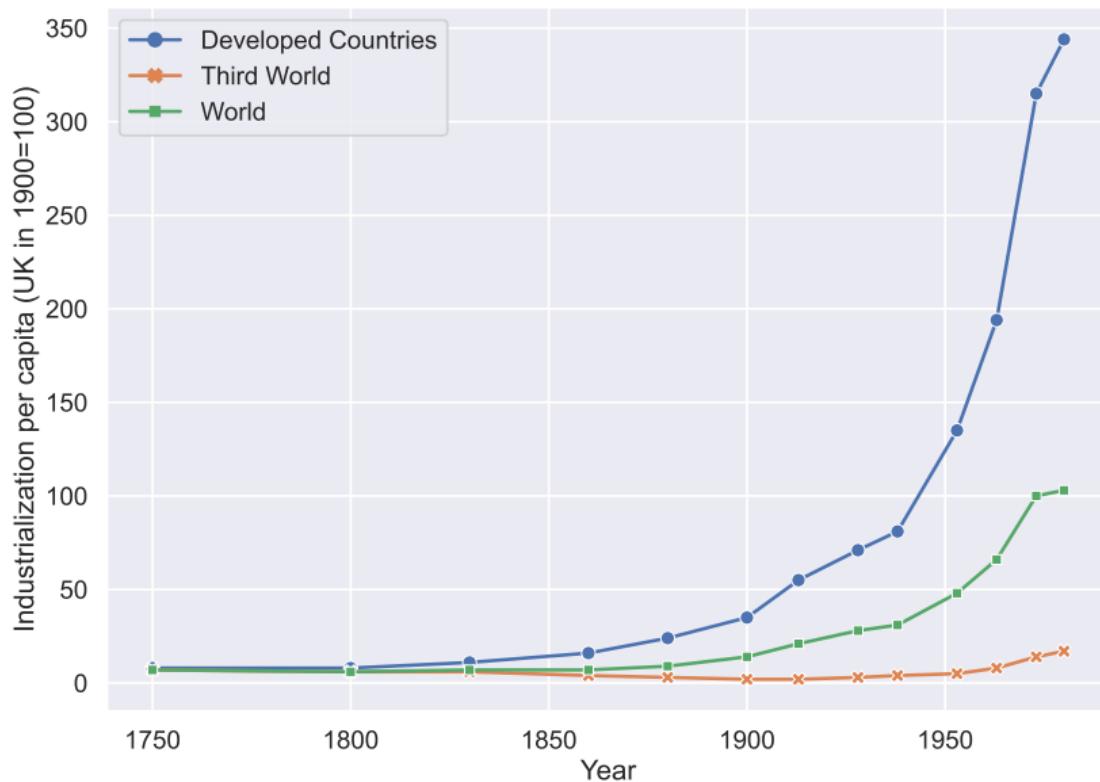
## Take-off: Growth of Population & Income per Capita – Africa



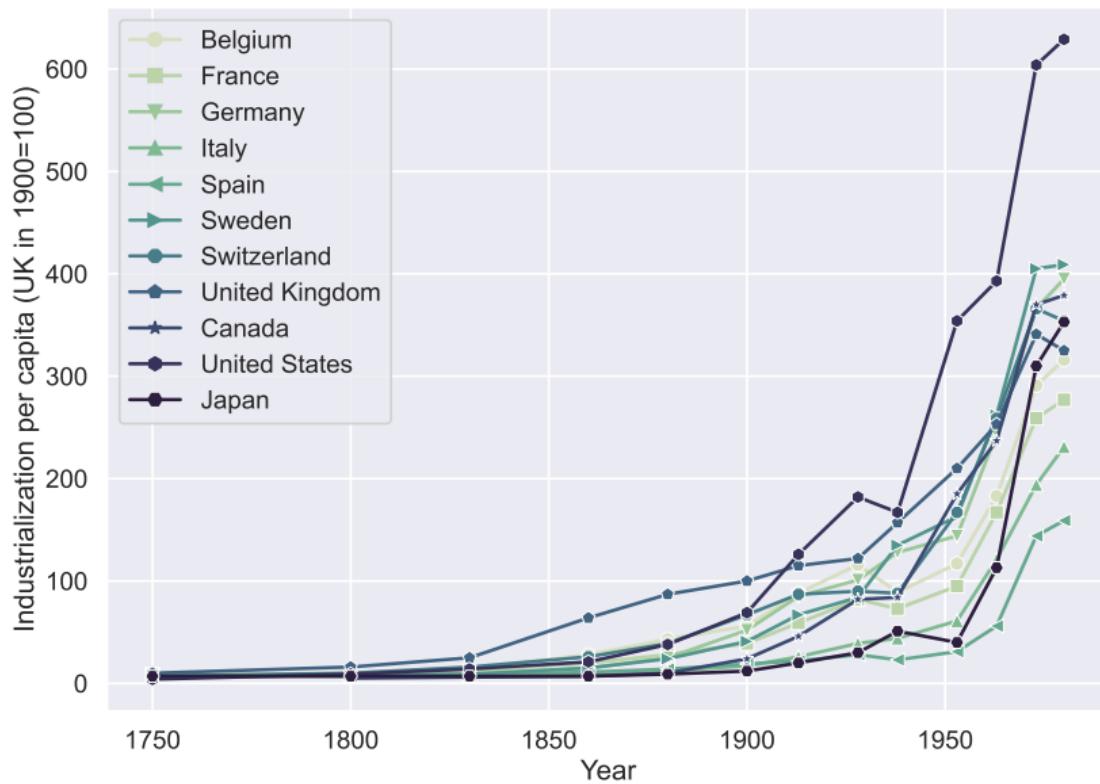
## Take-off: Growth of Population & Income per Capita – Asia



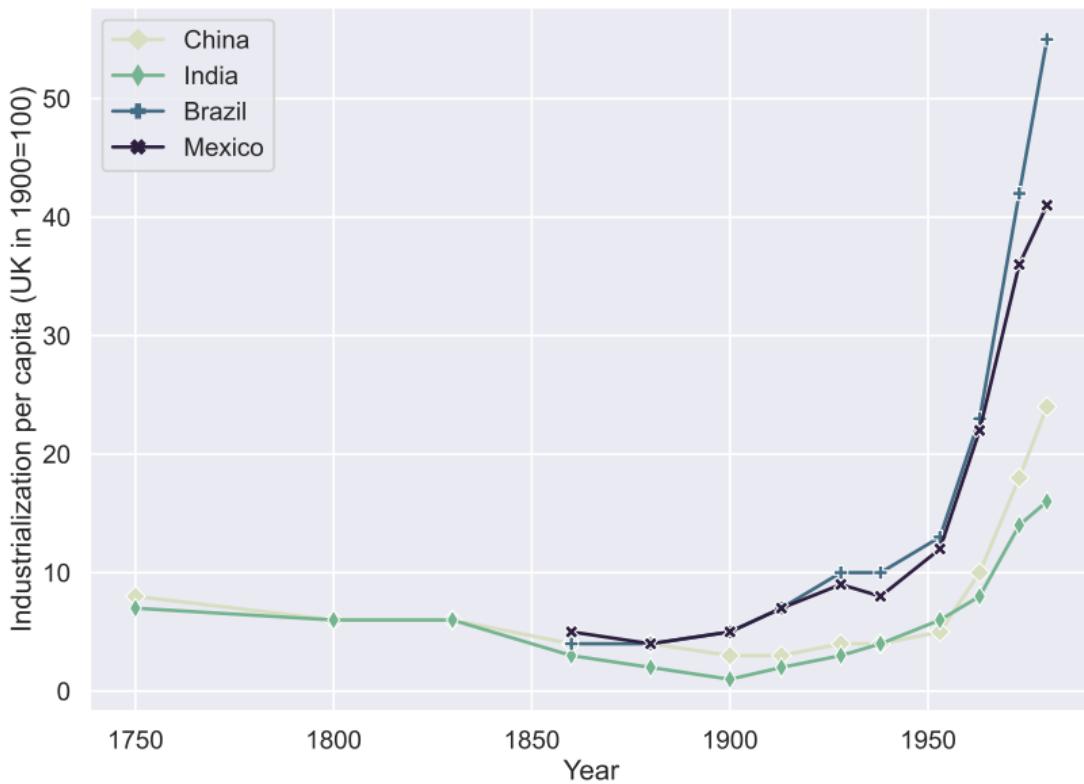
## Take-off & Increased Industrialization per Capita



## 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 Revolution, Information Revolution

- Human capital formation

→ Education, Health Care, Research & Development, Infrastructure, Capital Accumulation

- The decline in population growth

→ Migration, Fertility Decline, Death Rate Decline, Natural Increase, Urbanization, Industrialization

- Technological progress, human capital formation & decline in population growth

→ Industrialization, Globalization

## The Modern Growth Regime

- Sustained economic growth
  - Acceleration in technological progress
    - ⇒ Industrial demand for human capital
  - Human capital formation
    - ⇒ Industrial demand for human capital
  - The decline in population growth
    - ⇒ Industrial demand for human capital
  - Technological progress, human capital formation & decline in population growth
    - ⇒ Industrial demand for human capital

## The Modern Growth Regime

- Sustained economic growth
  - Acceleration in technological progress
    - ⇒ Industrial demand for human capital
  - Human capital formation
- The decline in population growth
  - ⇒ Industrial demand for human capital
- Technological progress, human capital formation & decline in population growth
  - ⇒ Industrial demand for human capital

## 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
    - ⇒ Industrial demand for human capital
  - Technological progress, human capital formation & decline in population growth
    - ⇒ Industrial demand for human capital

## 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
- Technological progress, human capital formation & decline in population growth

## 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

## 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

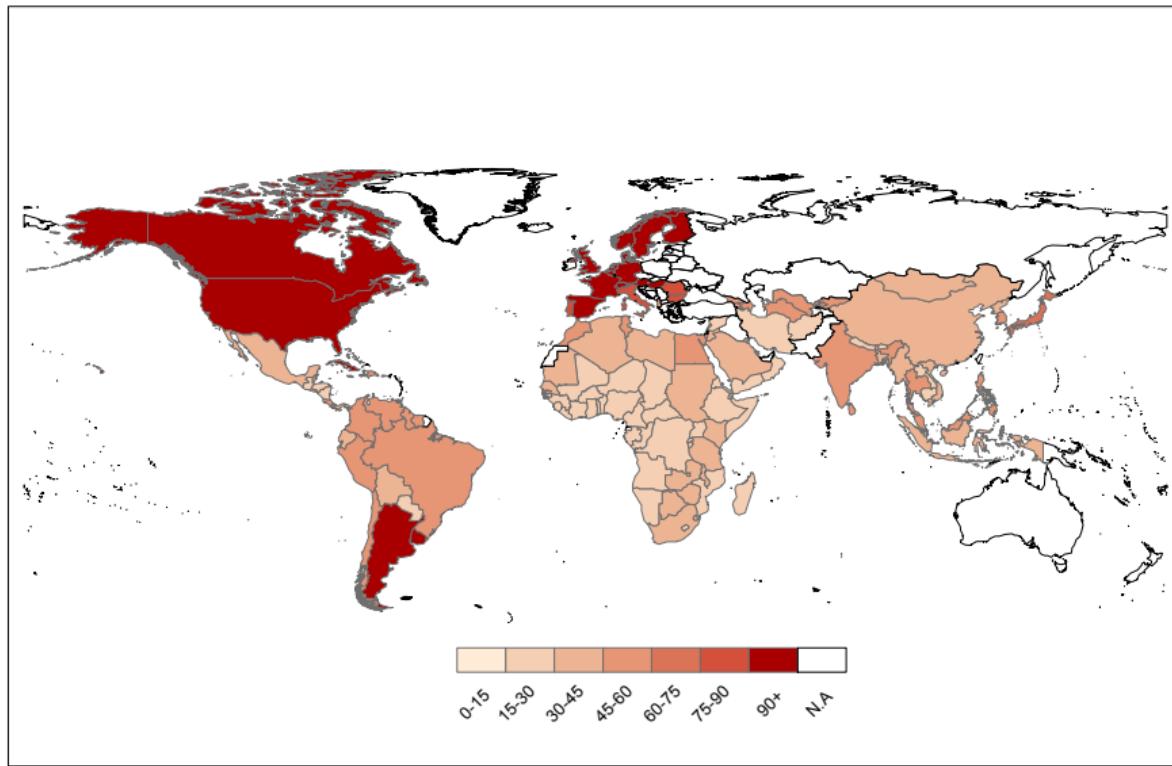
## The Modern Growth Regime

- 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

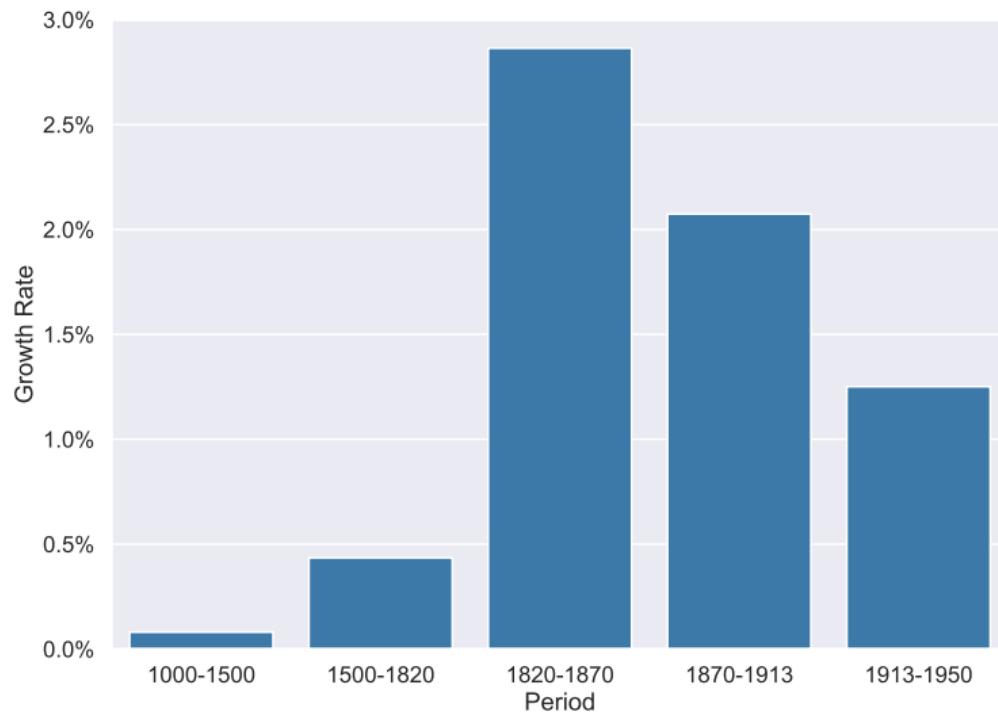
## The Modern Growth Regime

- 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

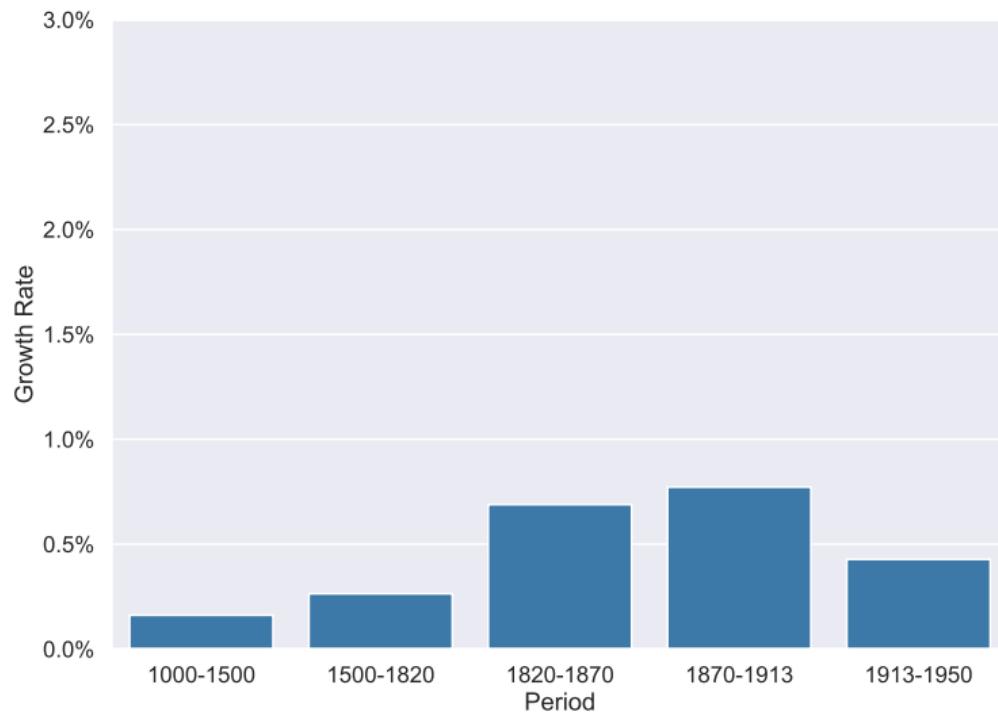
## Variation in Years Elapsed since the Onset of the Fertility Decline



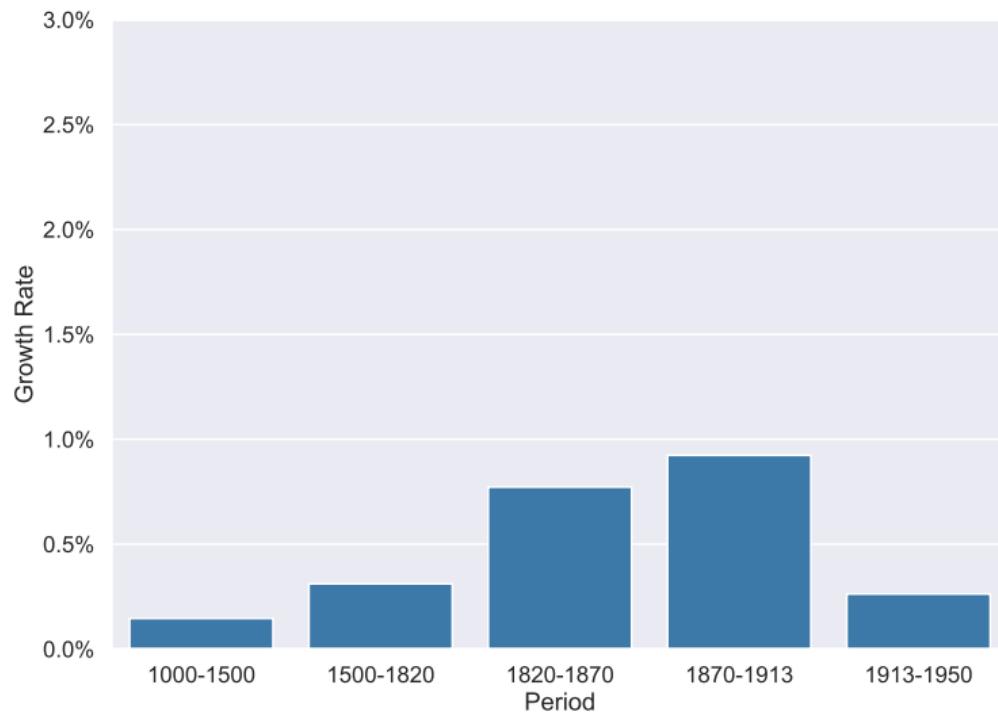
## Early Fertility Decline – Western Offshoots



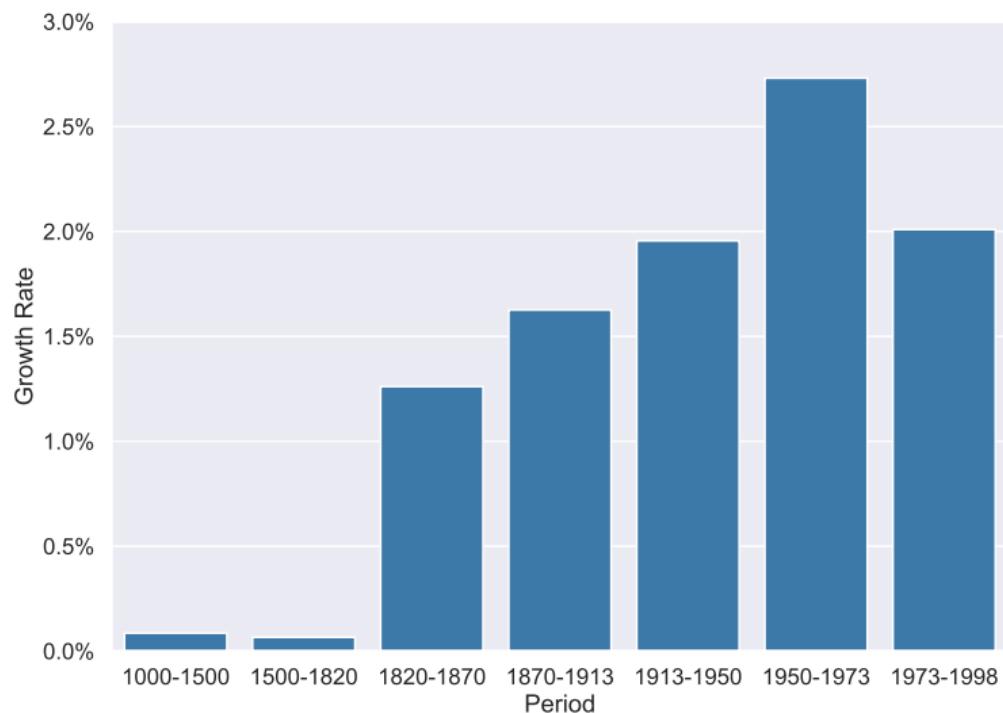
## Early Fertility Decline – Western Europe



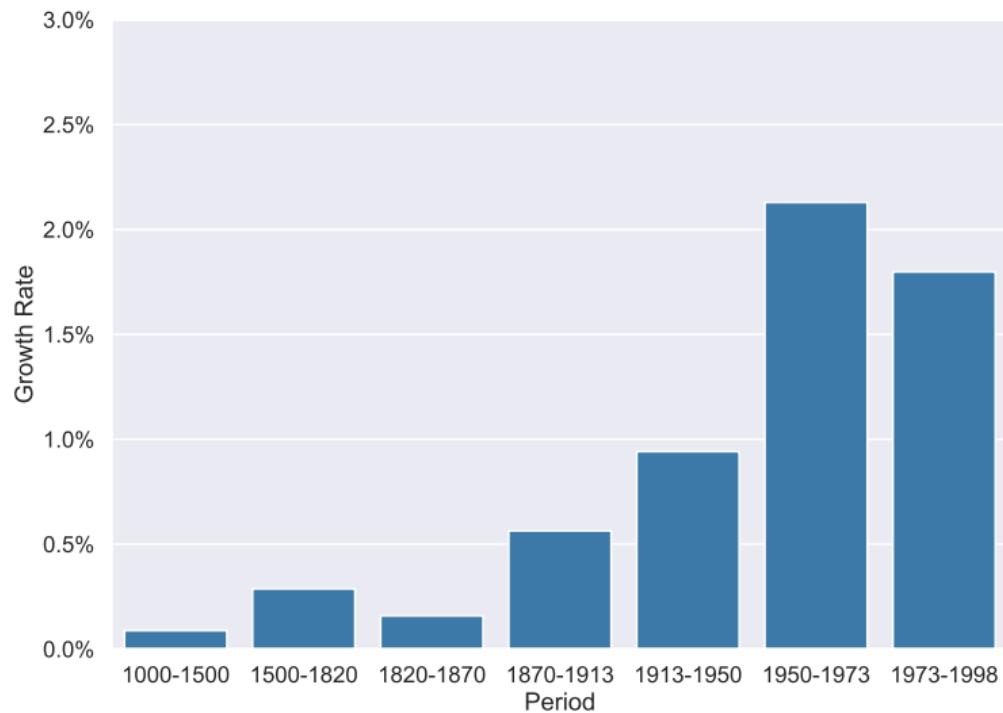
## Early Fertility Decline – Eastern Europe



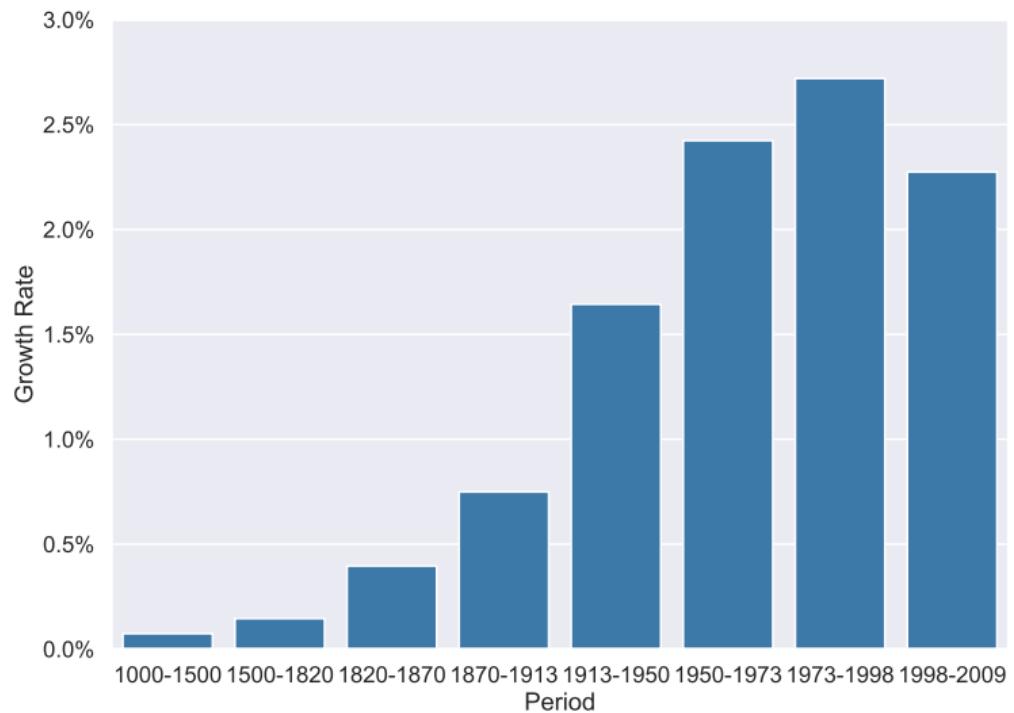
## Late Fertility Decline – Latin America



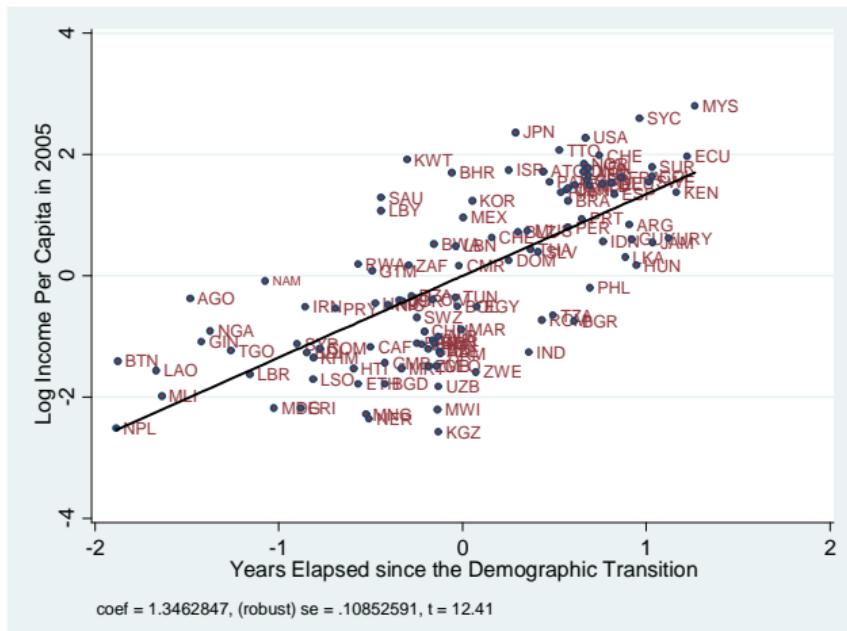
## Late Fertility Decline – Asia



## Late Fertility Decline – Africa

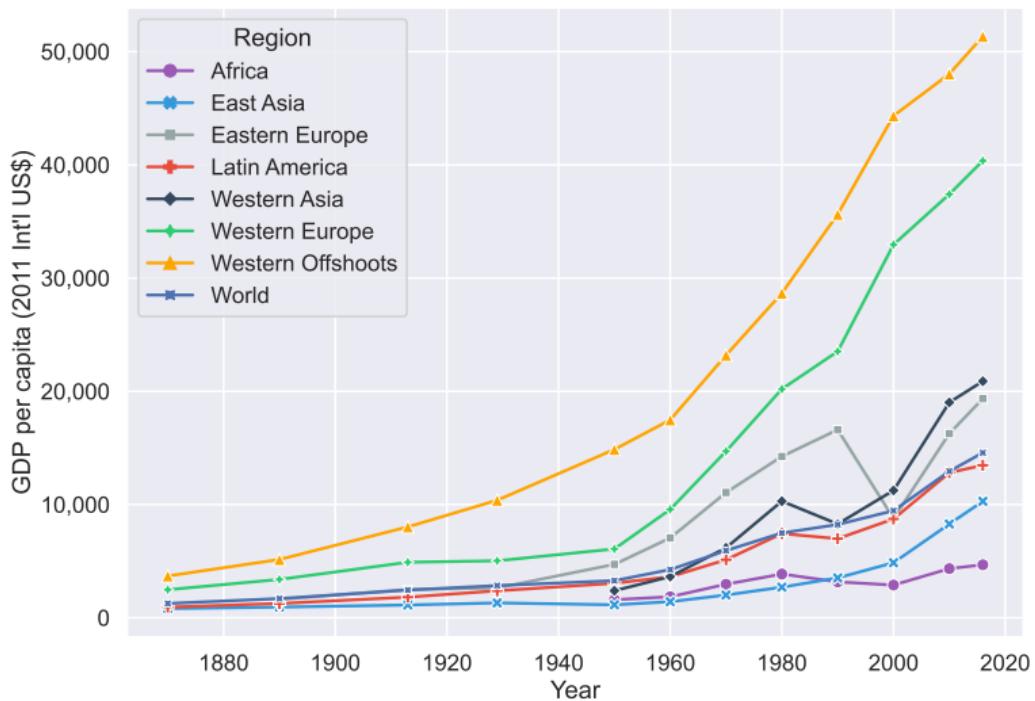


## Timing of the Demographic Transition and Current Income per Capita

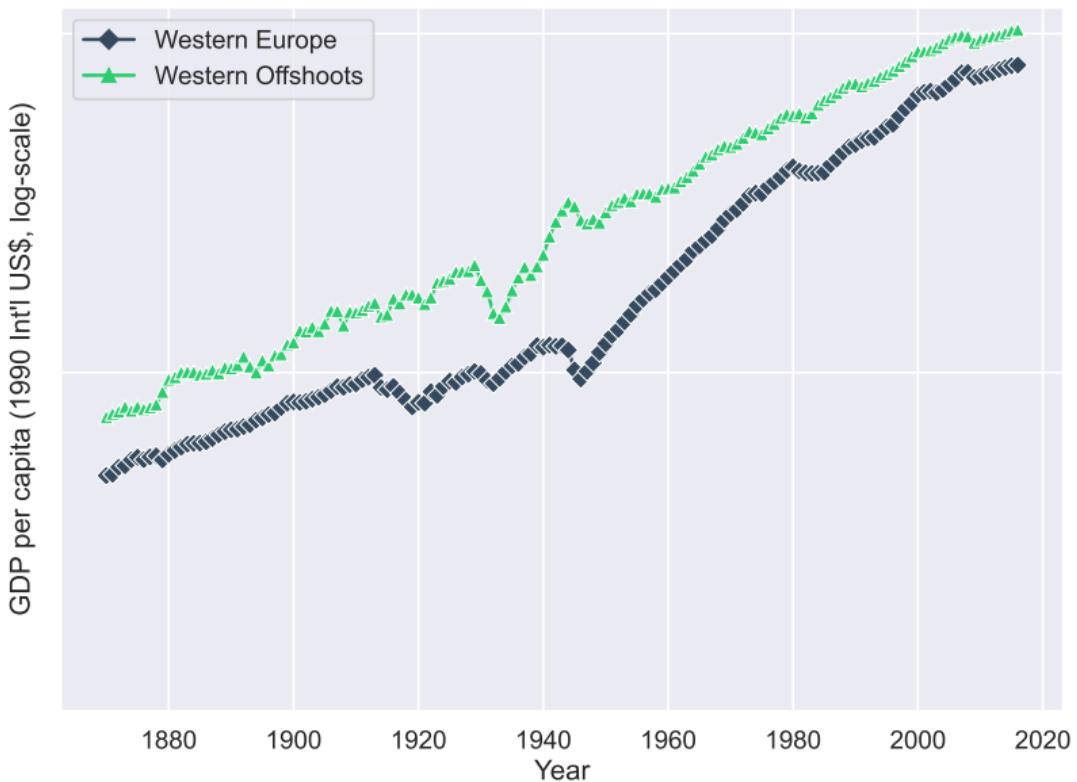


Conditional on absolute latitude.

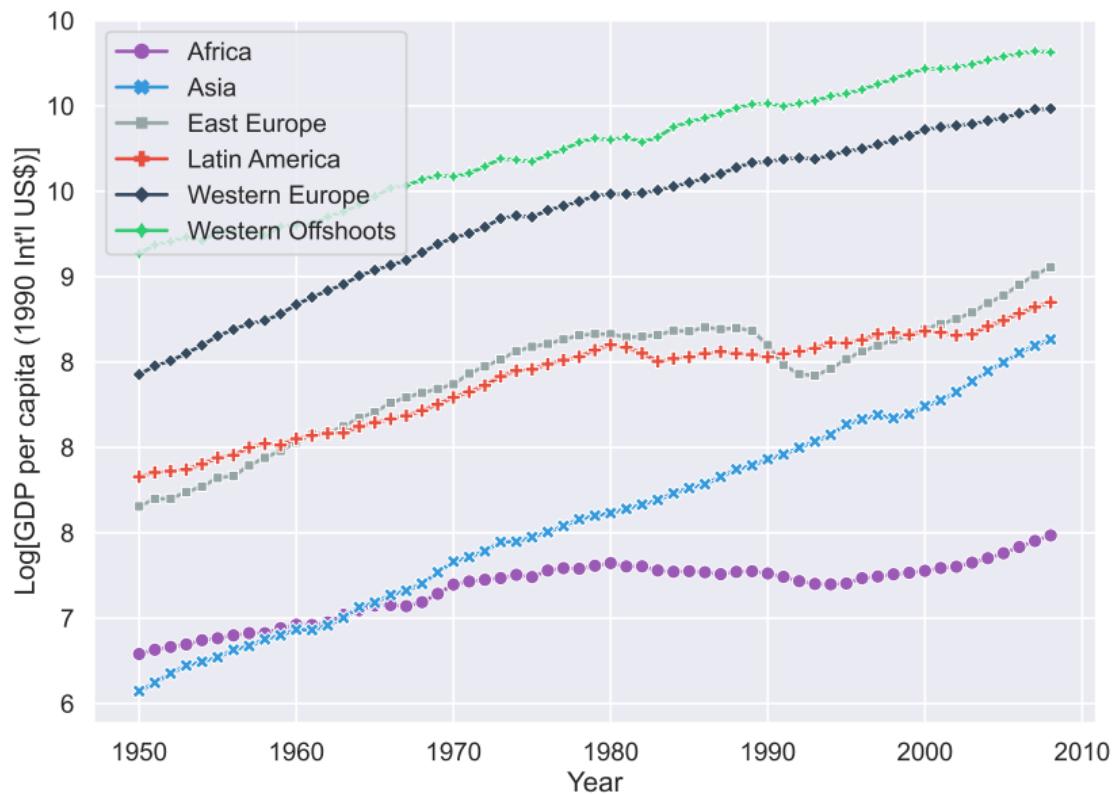
# Timing of the Demographic Transition and Divergence across Regions



## Sustained Economic Growth: 1870–2000



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



# The Big Questions

## The Big Questions

- Why are there differences in the level of welfare/income across societies and time?
- Why do some societies become rich while others remain poor?
- What can we do to improve the lives of those left behind?

## The Big Questions

- Why are there differences in the level of welfare/income across societies and time?
- Why do some societies become rich while others remain poor?
- What can we do to improve the lives of those left behind?

## The Big Questions

- Why are there differences in the level of welfare/income across societies and time?
- Why do some societies become rich while others remain poor?
- What can we do to improve the lives of those left behind?

## Complementary Questions

- Why these huge differences?
  - What causes them?
  - Are they natural?
  - Can we do something about it?
  - Does the enjoyment of the rich depend on the suffering of the poor?

## Complementary Questions

- Why these huge differences?
  - What causes them?
    - Are they natural?
    - Can we do something about it?
    - Does the enjoyment of the rich depend on the suffering of the poor?

## Complementary Questions

- Why these huge differences?
  - What causes them?
  - Are they natural?
  - Can we do something about it?
  - Does the enjoyment of the rich depend on the suffering of the poor?

## Complementary Questions

- Why these huge differences?
  - What causes them?
  - Are they natural?
  - Can we do something about it?
  - Does the enjoyment of the rich depend on the suffering of the poor?

## Complementary Questions

- Why these huge differences?
  - What causes them?
  - Are they natural?
  - Can we do something about it?
  - Does the enjoyment of the rich depend on the suffering of the poor?

## 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?

## 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?

## 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?

## 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?

## 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?

## 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?

## 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?

## Fundamental Research Questions: Transition from Stagnation to Growth

- What are the factors that generated the transition from stagnation to growth of DCs?
- What are the hurdles faced by LDCs in the transition from stagnation to growth?
- What triggered the demographic transition?
- Is the demographic transition a necessary condition for sustained economic growth?

## Fundamental Research Questions: Transition from Stagnation to Growth

- What are the factors that generated the transition from stagnation to growth of DCs?
- What are the hurdles faced by LDCs in the transition from stagnation to growth?
- What triggered the demographic transition?
- Is the demographic transition a necessary condition for sustained economic growth?

## Fundamental Research Questions: Transition from Stagnation to Growth

- What are the factors that generated the transition from stagnation to growth of DCs?
- What are the hurdles faced by LDCs in the transition from stagnation to growth?
- What triggered the demographic transition?
- Is the demographic transition a necessary condition for sustained economic growth?

## Fundamental Research Questions: Transition from Stagnation to Growth

- What are the factors that generated the transition from stagnation to growth of DCs?
- What are the hurdles faced by LDCs in the transition from stagnation to growth?
- What triggered the demographic transition?
- Is the demographic transition a necessary condition for sustained economic growth?

## Fundamental Research Questions: Comparative Development

- What accounts for the transition from stagnation to growth in some countries and the persistent stagnation in others?
- What governs the differential timing of the demographic transition across nations?
- What is the origin of the vast inequality that emerged across countries in the past two centuries?
- Has the earlier transition of advanced economies adversely affected the process of development in LDCs?
- What is the contribution of deep rooted factors to the vast inequality across countries?

## Fundamental Research Questions: Comparative Development

- What accounts for the transition from stagnation to growth in some countries and the persistent stagnation in others?
- What governs the differential timing of the demographic transition across nations?
- What is the origin of the vast inequality that emerged across countries in the past two centuries?
- Has the earlier transition of advanced economies adversely affected the process of development in LDCs?
- What is the contribution of deep rooted factors to the vast inequality across countries?

## Fundamental Research Questions: Comparative Development

- What accounts for the transition from stagnation to growth in some countries and the persistent stagnation in others?
- What governs the differential timing of the demographic transition across nations?
- What is the origin of the vast inequality that emerged across countries in the past two centuries?
- Has the earlier transition of advanced economies adversely affected the process of development in LDCs?
- What is the contribution of deep rooted factors to the vast inequality across countries?

## Fundamental Research Questions: Comparative Development

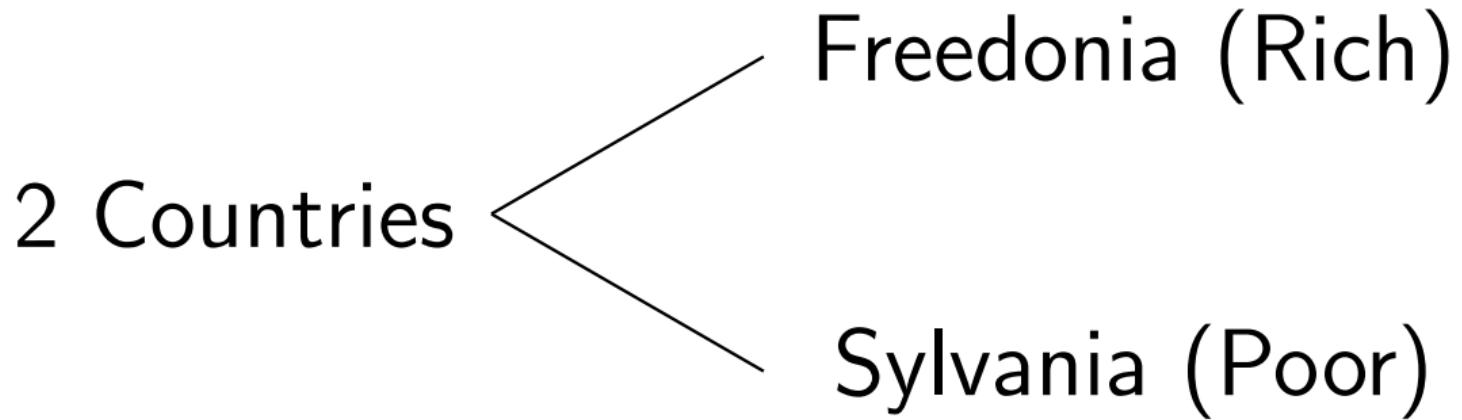
- What accounts for the transition from stagnation to growth in some countries and the persistent stagnation in others?
- What governs the differential timing of the demographic transition across nations?
- What is the origin of the vast inequality that emerged across countries in the past two centuries?
- Has the earlier transition of advanced economies adversely affected the process of development in LDCs?
- What is the contribution of deep rooted factors to the vast inequality across countries?

## Fundamental Research Questions: Comparative Development

- What accounts for the transition from stagnation to growth in some countries and the persistent stagnation in others?
- What governs the differential timing of the demographic transition across nations?
- What is the origin of the vast inequality that emerged across countries in the past two centuries?
- Has the earlier transition of advanced economies adversely affected the process of development in LDCs?
- What is the contribution of deep rooted factors to the vast inequality across countries?

# Framework

## A Simple Parable



## Sylvania vs. Freedonia

We observe

$$\frac{GDP_F}{GDP_S} = 16, \quad \frac{L_F}{L_S} = 2, \quad \implies \frac{GDP_{pcF}}{GDP_{pcS}} = \frac{GDP_F/L_F}{GDP_S/L_S} = 8.$$

We know/assume

$$Y_F = F_F(K_F, L_F),$$

$$Y_S = F_S(K_S, L_S),$$

and we observe

$$\frac{K_F}{L_F} > \frac{K_S}{L_S}.$$

From your macroeconomics class, we know that

$$\text{higher } \frac{K}{L} \implies \text{higher } \frac{Y}{L}.$$

## Sylvania vs. Freedonia

We observe

$$\frac{GDP_F}{GDP_S} = 16, \quad \frac{L_F}{L_S} = 2, \quad \implies \frac{GDPpc_F}{GDPpc_S} = \frac{GDP_F/L_F}{GDP_S/L_S} = 8.$$

We know/assume

$$Y_F = F_F(K_F, L_F),$$

$$Y_S = F_S(K_S, L_S),$$

and we observe

$$\frac{K_F}{L_F} > \frac{K_S}{L_S}.$$

From your macroeconomics class, we know that

$$\text{higher } \frac{K}{L} \implies \text{higher } \frac{Y}{L}.$$

## Sylvania vs. Freedonia

We observe

$$\frac{GDP_F}{GDP_S} = 16, \quad \frac{L_F}{L_S} = 2, \quad \implies \frac{GDPpc_F}{GDPpc_S} = \frac{GDP_F/L_F}{GDP_S/L_S} = 8.$$

We know/assume

$$Y_F = F_F(K_F, L_F),$$

$$Y_S = F_S(K_S, L_S),$$

and we observe

$$\frac{K_F}{L_F} > \frac{K_S}{L_S}.$$

From your macroeconomics class, we know that

$$\text{higher } \frac{K}{L} \implies \text{higher } \frac{Y}{L}.$$

## Sylvania vs. Freedonia

We observe

$$\frac{GDP_F}{GDP_S} = 16, \quad \frac{L_F}{L_S} = 2, \quad \implies \frac{GDPpc_F}{GDPpc_S} = \frac{GDP_F/L_F}{GDP_S/L_S} = 8.$$

We know/assume

$$Y_F = F_F(K_F, L_F),$$

$$Y_S = F_S(K_S, L_S),$$

and we observe

$$\frac{K_F}{L_F} > \frac{K_S}{L_S}.$$

From your macroeconomics class, we know that

$$\text{higher } \frac{K}{L} \implies \text{higher } \frac{Y}{L}.$$

## Sylvania vs. Freedonia

We observe

$$\frac{GDP_F}{GDP_S} = 16, \quad \frac{L_F}{L_S} = 2, \quad \implies \frac{GDPpc_F}{GDPpc_S} = \frac{GDP_F/L_F}{GDP_S/L_S} = 8.$$

We know/assume

$$Y_F = F_F(K_F, L_F),$$

$$Y_S = F_S(K_S, L_S),$$

and we observe

$$\frac{K_F}{L_F} > \frac{K_S}{L_S}.$$

From your macroeconomics class, we know that

$$\text{higher } \frac{K}{L} \implies \text{higher } \frac{Y}{L}.$$

## Sylvania vs. Freedonia

One possible answer:

Freedonia invests more in  $K$  than Sylvania.

How do we test this?

We observe

$$\frac{I_F}{I_S} = 32$$

We know in equilibrium  $I = S$  and  $S = s \cdot Y$ .

So,

$$\frac{S_F}{S_S} = \frac{s_F \cdot Y_F}{s_S \cdot Y_S} = \frac{s_F}{s_S} \cdot 16.$$

Which implies that

$$32 = \frac{I_F}{I_S} = \frac{S_F}{S_S} = \frac{s_F}{s_S} \cdot 16 \iff \frac{s_F}{s_S} = 2.$$

## Sylvania vs. Freedonia

One possible answer:

Freedonia invests more in  $K$  than Sylvania.

How do we test this?

We observe

$$\frac{I_F}{I_S} = 32$$

We know in equilibrium  $I = S$  and  $S = s \cdot Y$ .

So,

$$\frac{S_F}{S_S} = \frac{s_F \cdot Y_F}{s_S \cdot Y_S} = \frac{s_F}{s_S} \cdot 16.$$

Which implies that

$$32 = \frac{I_F}{I_S} = \frac{S_F}{S_S} = \frac{s_F}{s_S} \cdot 16 \iff \frac{s_F}{s_S} = 2.$$

## Sylvania vs. Freedonia

One possible answer:

Freedonia invests more in  $K$  than Sylvania.

How do we test this?

We observe

$$\frac{I_F}{I_S} = 32$$

We know in equilibrium  $I = S$  and  $S = s \cdot Y$ .

So,

$$\frac{S_F}{S_S} = \frac{s_F \cdot Y_F}{s_S \cdot Y_S} = \frac{s_F}{s_S} \cdot 16.$$

Which implies that

$$32 = \frac{I_F}{I_S} = \frac{S_F}{S_S} = \frac{s_F}{s_S} \cdot 16 \iff \frac{s_F}{s_S} = 2.$$

## Sylvania vs. Freedonia

One possible answer:

Freedonia invests more in  $K$  than Sylvania.

How do we test this?

We observe

$$\frac{I_F}{I_S} = 32$$

We know in equilibrium  $I = S$  and  $S = s \cdot Y$ .

So,

$$\frac{S_F}{S_S} = \frac{s_F \cdot Y_F}{s_S \cdot Y_S} = \frac{s_F}{s_S} \cdot 16.$$

Which implies that

$$32 = \frac{I_F}{I_S} = \frac{S_F}{S_S} = \frac{s_F}{s_S} \cdot 16 \iff \frac{s_F}{s_S} = 2.$$

## Sylvania vs. Freedonia

One possible answer:

Freedonia invests more in  $K$  than Sylvania.

How do we test this?

We observe

$$\frac{I_F}{I_S} = 32$$

We know in equilibrium  $I = S$  and  $S = s \cdot Y$ .

So,

$$\frac{S_F}{S_S} = \frac{s_F \cdot Y_F}{s_S \cdot Y_S} = \frac{s_F}{s_S} \cdot 16.$$

Which implies that

$$32 = \frac{I_F}{I_S} = \frac{S_F}{S_S} = \frac{s_F}{s_S} \cdot 16 \iff \frac{s_F}{s_S} = 2.$$

## Sylvania vs. Freedonia

### Note

Given the data we have, Freedonia would need to save twice as much as Sylvania to explain the differences in investment.

But, the ratio of their actual savings rates may be different from the computed ratio of 2.

What now?

## Sylvania vs. Freedonia

### Note

Given the data we have, Freedonia would need to save twice as much as Sylvania to explain the differences in investment.

**But**, the ratio of their actual savings rates may be different from the computed ratio of 2.

What now?

## Sylvania vs. Freedonia

### Note

Given the data we have, Freedonia would need to save twice as much as Sylvania to explain the differences in investment.

**But**, the ratio of their actual savings rates may be different from the computed ratio of 2.

What now?

## Sylvania vs. Freedonia

### Note

Given the data we have, Freedonia would need to save twice as much as Sylvania to explain the differences in investment.

**But**, the ratio of their actual savings rates may be different from the computed ratio of 2.

What now?

- *Get data on savings rates*
- *Compare ratio to the value we computed*
- *How much of the income differences can be explained by this?*

## Sylvania vs. Freedonia

### Note

Given the data we have, Freedonia would need to save twice as much as Sylvania to explain the differences in investment.

**But**, the ratio of their actual savings rates may be different from the computed ratio of 2.

What now?

- *Get data on savings rates*
- *Compare ratio to the value we computed*
- *How much of the income differences can be explained by this?*

## Sylvania vs. Freedonia

### Note

Given the data we have, Freedonia would need to save twice as much as Sylvania to explain the differences in investment.

**But**, the ratio of their actual savings rates may be different from the computed ratio of 2.

What now?

- *Get data on savings rates*
- *Compare ratio to the value we computed*
- *How much of the income differences can be explained by this?*

# Sylvania vs. Freedonia

Two possible outcomes

## Sylvania vs. Freedonia

### Two possible outcomes

- Difference in  $s$  explains **all** the difference in income per capita  $y$

⇒ Why are there differences in  $s$ ?

- Difference in  $s$  explains **only part** of the difference in  $y$

⇒ What else explains the difference in  $y$ ?

## Sylvania vs. Freedonia

### Two possible outcomes

- Difference in  $s$  explains **all** the difference in income per capita  $y$   
     $\Rightarrow$  Why are there differences in  $s$ ?
- Difference in  $s$  explains **only part** of the difference in  $y$

## Sylvania vs. Freedonia

### Two possible outcomes

- Difference in  $s$  explains **all** the difference in income per capita  $y$ 
  - ⇒ Why are there differences in  $s$ ?
- Difference in  $s$  explains **only part** of the difference in  $y$ 
  - What else can explain the difference in  $y$ ?
  - Why are there differences in  $s$ ?

## Sylvania vs. Freedonia

### Two possible outcomes

- Difference in  $s$  explains **all** the difference in income per capita  $y$   
     $\Rightarrow$  Why are there differences in  $s$ ?
- Difference in  $s$  explains **only part** of the difference in  $y$ 
  - What else can explain the difference in  $y$ ?
  - Why are there differences in  $s$ ?

## Sylvania vs. Freedonia

### Two possible outcomes

- Difference in  $s$  explains **all** the difference in income per capita  $y$   
     $\Rightarrow$  Why are there differences in  $s$ ?
- Difference in  $s$  explains **only part** of the difference in  $y$ 
  - What else can explain the difference in  $y$ ?
  - Why are there differences in  $s$ ?

## Sylvania vs. Freedonia

Additional possible answer:

Freedonia is more technologically advanced than Sylvania.

Additional possible answer:

Freedonia is more efficient than Sylvania at production, i.e., with same technology and inputs it can produce more output.

Assume these three forces explain all the differences in income

- Why are there differences in savings/investment rates?
- Why are there differences in technology?
- Why are there differences in efficiency?

Our original answers

Do not provide **fundamental** answers

They are only **proximate** answers to our big questions

## Sylvania vs. Freedonia

### Additional possible answer:

Freedonia is more technologically advanced than Sylvania.

### Additional possible answer:

Freedonia is more efficient than Sylvania at production, i.e., with same technology and inputs it can produce more output.

Assume these three forces explain all the differences in income

- Why are there differences in savings/investment rates?
- Why are there differences in technology?
- Why are there differences in efficiency?

Our original answers

Do not provide **fundamental** answers

They are only **proximate** answers to our big questions

## Sylvania vs. Freedonia

Additional possible answer:

Freedonia is more technologically advanced than Sylvania.

Additional possible answer:

Freedonia is more efficient than Sylvania at production, i.e., with same technology and inputs it can produce more output.

Assume these three forces explain all the differences in income

Our original answers

Do not provide fundamental answers

They are only proximate answers to our big questions

## Sylvania vs. Freedonia

### Additional possible answer:

Freedonia is more technologically advanced than Sylvania.

### Additional possible answer:

Freedonia is more efficient than Sylvania at production, i.e., with same technology and inputs it can produce more output.

### Assume these three forces explain all the differences in income

- Why are there differences in savings/investment rates?
- Why are there differences in technology?
- Why are there differences in efficiency?

### Our original answers

Do not provide **fundamental** answers

They are only **proximate** answers to our big questions

## Sylvania vs. Freedonia

Additional possible answer:

Freedonia is more technologically advanced than Sylvania.

Additional possible answer:

Freedonia is more efficient than Sylvania at production, i.e., with same technology and inputs it can produce more output.

Assume these three forces explain all the differences in income

- Why are there differences in savings/investment rates?
- Why are there differences in technology?
- Why are there differences in efficiency?

Our original answers

Do not provide fundamental answers

They are only proximate answers to our big questions

## Sylvania vs. Freedonia

Additional possible answer:

Freedonia is more technologically advanced than Sylvania.

Additional possible answer:

Freedonia is more efficient than Sylvania at production, i.e., with same technology and inputs it can produce more output.

Assume these three forces explain all the differences in income

- Why are there differences in savings/investment rates?
- Why are there differences in technology?
- Why are there differences in efficiency?

Our original answers

Do not provide fundamental answers

They are only proximate answers to our big questions

## Sylvania vs. Freedonia

### Additional possible answer:

Freedonia is more technologically advanced than Sylvania.

### Additional possible answer:

Freedonia is more efficient than Sylvania at production, i.e., with same technology and inputs it can produce more output.

### Assume these three forces explain all the differences in income

- Why are there differences in savings/investment rates?
- Why are there differences in technology?
- Why are there differences in efficiency?

### Our original answers

Do not provide **fundamental** answers

They are only **proximate** answers to our big questions

## Proximate vs. Fundamental/Ultimate/Deep Causes

### How shall we answer

### Two Types of Answers

- Proximate
- Fundamental/Ultimate/Deep

Both are important and interesting!

## Proximate vs. Fundamental/Ultimate/Deep Causes

### How shall we answer

- Why did  $X$  happen?
- Why is something this way?

### Two Types of Answers

- Proximate
- Fundamental/Ultimate/Deep

Both are important and interesting!

## Proximate vs. Fundamental/Ultimate/Deep Causes

### How shall we answer

- Why did  $X$  happen?
- Why is something this way?

### Two Types of Answers

- Proximate
- Fundamental/Ultimate/Deep

Both are important and interesting!

## Proximate vs. Fundamental/Ultimate/Deep Causes

### How shall we answer

- Why did  $X$  happen?
- Why is something this way?

### Two Types of Answers

Both are important and interesting!

## Proximate vs. Fundamental/Ultimate/Deep Causes

### How shall we answer

- Why did  $X$  happen?
- Why is something this way?

### Two Types of Answers

- Proximate
- Fundamental/Ultimate/Deep

Both are important and interesting!

## Proximate vs. Fundamental/Ultimate/Deep Causes

### How shall we answer

- Why did  $X$  happen?
- Why is something this way?

### Two Types of Answers

- Proximate
- Fundamental/Ultimate/Deep

Both are important and interesting!

## Proximate vs. Fundamental/Ultimate/Deep Causes

### How shall we answer

- Why did  $X$  happen?
- Why is something this way?

### Two Types of Answers

- Proximate
- Fundamental/Ultimate/Deep

Both are important and interesting!

## Flaubert's - Madame Bovary

### Plot

- Charles Bovary becomes a doctor in Normandy, France in XIX century
- Emma Rouault is a young, beautiful, and educated woman
- She has a powerful yearning for luxury and romance inspired by reading popular novels
- She marries Charles Bovary, becomes Madame Bovary
- She is disappointed at married life and motherhood
- She takes on lovers, but is disappointed
- She indulges in shopping sprees using credit
- Huge debt that gets collected...
- No one, including lovers, help her out
- Desperate, she kills herself with arsenic

## Flaubert's - Madame Bovary

### Plot

- Charles Bovary becomes a doctor in Normandy, France in XIX century
- Emma Rouault is a young, beautiful, and educated woman
- She has a powerful yearning for luxury and romance inspired by reading popular novels
- She marries Charles Bovary, becomes Madame Bovary
- She is disappointed at married life and motherhood
- She takes on lovers, but is disappointed
- She indulges in shopping sprees using credit
- Huge debt that gets collected...
- No one, including lovers, help her out
- Desperate, she kills herself with arsenic

## Flaubert's - Madame Bovary

### Plot

- Charles Bovary becomes a doctor in Normandy, France in XIX century
- Emma Rouault is a young, beautiful, and educated woman
- She has a powerful yearning for luxury and romance inspired by reading popular novels
- She marries Charles Bovary, becomes Madame Bovary
- She is disappointed at married life and motherhood
- She takes on lovers, but is disappointed
- She indulges in shopping sprees using credit
- Huge debt that gets collected...
- No one, including lovers, help her out
- Desperate, she kills herself with arsenic

## Flaubert's - Madame Bovary

### Plot

- Charles Bovary becomes a doctor in Normandy, France in XIX century
- Emma Rouault is a young, beautiful, and educated woman
- She has a powerful yearning for luxury and romance inspired by reading popular novels
- She marries Charles Bovary, becomes Madame Bovary
- She is disappointed at married life and motherhood
- She takes on lovers, but is disappointed
- She indulges in shopping sprees using credit
- Huge debt that gets collected...
- No one, including lovers, help her out
- Desperate, she kills herself with arsenic

## Flaubert's - Madame Bovary

### Plot

- Charles Bovary becomes a doctor in Normandy, France in XIX century
- Emma Rouault is a young, beautiful, and educated woman
- She has a powerful yearning for luxury and romance inspired by reading popular novels
- She marries Charles Bovary, becomes Madame Bovary
- She is disappointed at married life and motherhood
  - She takes on lovers, but is disappointed
  - She indulges in shopping sprees using credit
  - Huge debt that gets collected...
  - No one, including lovers, help her out
  - Desperate, she kills herself with arsenic

## Flaubert's - Madame Bovary

### Plot

- Charles Bovary becomes a doctor in Normandy, France in XIX century
- Emma Rouault is a young, beautiful, and educated woman
- She has a powerful yearning for luxury and romance inspired by reading popular novels
- She marries Charles Bovary, becomes Madame Bovary
- She is disappointed at married life and motherhood
- She takes on lovers, but is disappointed
  - She indulges in shopping sprees using credit
  - Huge debt that gets collected...
  - No one, including lovers, help her out
  - Desperate, she kills herself with arsenic

## Flaubert's - Madame Bovary

### Plot

- Charles Bovary becomes a doctor in Normandy, France in XIX century
- Emma Rouault is a young, beautiful, and educated woman
- She has a powerful yearning for luxury and romance inspired by reading popular novels
- She marries Charles Bovary, becomes Madame Bovary
- She is disappointed at married life and motherhood
- She takes on lovers, but is disappointed
- She indulges in shopping sprees using credit
- Huge debt that gets collected...
- No one, including lovers, help her out
- Desperate, she kills herself with arsenic

## Flaubert's - Madame Bovary

### Plot

- Charles Bovary becomes a doctor in Normandy, France in XIX century
- Emma Rouault is a young, beautiful, and educated woman
- She has a powerful yearning for luxury and romance inspired by reading popular novels
- She marries Charles Bovary, becomes Madame Bovary
- She is disappointed at married life and motherhood
- She takes on lovers, but is disappointed
- She indulges in shopping sprees using credit
- Huge debt that gets collected...
- No one, including lovers, help her out
- Desperate, she kills herself with arsenic

## Flaubert's - Madame Bovary

### Plot

- Charles Bovary becomes a doctor in Normandy, France in XIX century
- Emma Rouault is a young, beautiful, and educated woman
- She has a powerful yearning for luxury and romance inspired by reading popular novels
- She marries Charles Bovary, becomes Madame Bovary
- She is disappointed at married life and motherhood
- She takes on lovers, but is disappointed
- She indulges in shopping sprees using credit
- Huge debt that gets collected...
- No one, including lovers, help her out
- Desperate, she kills herself with arsenic

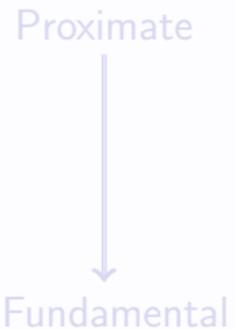
## Flaubert's - Madame Bovary

### Plot

- Charles Bovary becomes a doctor in Normandy, France in XIX century
- Emma Rouault is a young, beautiful, and educated woman
- She has a powerful yearning for luxury and romance inspired by reading popular novels
- She marries Charles Bovary, becomes Madame Bovary
- She is disappointed at married life and motherhood
- She takes on lovers, but is disappointed
- She indulges in shopping sprees using credit
- Huge debt that gets collected...
- No one, including lovers, help her out
- Desperate, she kills herself with arsenic

# Why did Madame Bovary die?

Possible answers:



## Why did Madame Bovary die?

### Possible answers:

- Consumed arsenic
- Desire to commit suicide
- Infidelity and financial ruin
- Unrealizable romantic feelings
- Limited role for women in XIX century France

Proximate



Fundamental

## Why did Madame Bovary die?

### Possible answers:

- Consumed arsenic
- Desire to commit suicide
- Infidelity and financial ruin
- Unrealizable romantic feelings
- Limited role for women in XIX century France

Proximate



Fundamental

## Why did Madame Bovary die?

### Possible answers:

- Consumed arsenic
- Desire to commit suicide
- Infidelity and financial ruin
- Unrealizable romantic feelings
- Limited role for women in XIX century France

Proximate



Fundamental

## Why did Madame Bovary die?

### Possible answers:

- Consumed arsenic
- Desire to commit suicide
- Infidelity and financial ruin
- Unrealizable romantic feelings
- Limited role for women in XIX century France

Proximate



Fundamental

## Why did Madame Bovary die?

### Possible answers:

- Consumed arsenic
- Desire to commit suicide
- Infidelity and financial ruin
- Unrealizable romantic feelings
- Limited role for women in XIX century France

Proximate



Fundamental

## Why did Madame Bovary die?

Possible answers:

- Consumed arsenic
- Desire to commit suicide
- Infidelity and financial ruin
- Unrealizable romantic feelings
- Limited role for women in XIX century France

Proximate



Fundamental

# Causes of Economic Development

## Proximate Causes

- Capital accumulation
- Technological progress
- Political stability
- Good governance
- Free trade
- Openness to foreign investment
- Efficient institutions
- Skilled labor force
- Natural resources
- Infrastructure

## Fundamental Causes

- Institutions
- Culture
- Geography & Climate

# Causes of Economic Development

## Proximate Causes

- Production Function: Recipe -  $F(A, K, L)$
- Factor Accumulation: Ingredients -  $K, L, H$ , etc.
- Productivity: Use of Ingredients and Recipe
  - Technology

## Fundamental Causes

- Institutions
- Culture
- Geography & Climate

## Causes of Economic Development

### Proximate Causes

- Production Function: Recipe -  $F(A, K, L)$
- Factor Accumulation: Ingredients -  $K, L, H$ , etc.
- Productivity: Use of Ingredients and Recipe

Technology  
Institutions

### Fundamental Causes

- Institutions
- Culture
- Geography & Climate

## Causes of Economic Development

### Proximate Causes

- Production Function: Recipe -  $F(A, K, L)$
- Factor Accumulation: Ingredients -  $K, L, H$ , etc.
- Productivity: Use of Ingredients and Recipe
  - Technology
  - Efficiency

### Fundamental Causes

- Institutions
- Culture
- Geography & Climate

## Causes of Economic Development

### Proximate Causes

- Production Function: Recipe -  $F(A, K, L)$
- Factor Accumulation: Ingredients -  $K, L, H$ , etc.
- Productivity: Use of Ingredients and Recipe
  - Technology
  - Efficiency

### Fundamental Causes

- Institutions
- Culture
- Geography & Climate

## Causes of Economic Development

### Proximate Causes

- Production Function: Recipe -  $F(A, K, L)$
- Factor Accumulation: Ingredients -  $K, L, H$ , etc.
- Productivity: Use of Ingredients and Recipe
  - Technology
  - Efficiency

### Fundamental Causes

- Institutions
- Culture
- Geography & Climate

## Causes of Economic Development

### Proximate Causes

- Production Function: Recipe -  $F(A, K, L)$
- Factor Accumulation: Ingredients -  $K, L, H$ , etc.
- Productivity: Use of Ingredients and Recipe
  - Technology
  - Efficiency

### Fundamental Causes

## Causes of Economic Development

### Proximate Causes

- Production Function: Recipe -  $F(A, K, L)$
- Factor Accumulation: Ingredients -  $K, L, H$ , etc.
- Productivity: Use of Ingredients and Recipe
  - Technology
  - Efficiency

### Fundamental Causes

- Institutions
- Culture
- Geography & Climate

## Causes of Economic Development

### Proximate Causes

- Production Function: Recipe -  $F(A, K, L)$
- Factor Accumulation: Ingredients -  $K, L, H$ , etc.
- Productivity: Use of Ingredients and Recipe
  - Technology
  - Efficiency

### Fundamental Causes

- Institutions
- Culture
- Geography & Climate

## Causes of Economic Development

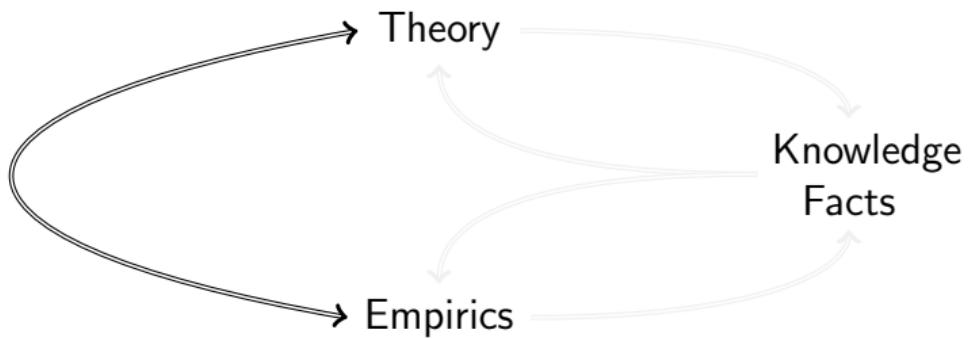
### Proximate Causes

- Production Function: Recipe -  $F(A, K, L)$
- Factor Accumulation: Ingredients -  $K, L, H$ , etc.
- Productivity: Use of Ingredients and Recipe
  - Technology
  - Efficiency

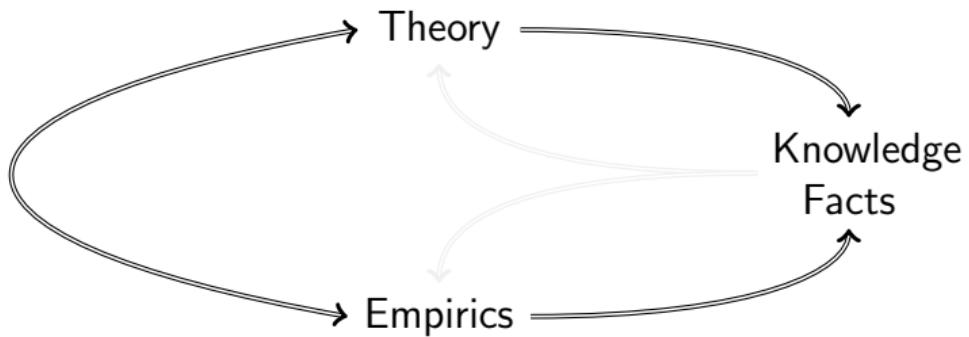
### Fundamental Causes

- Institutions
- Culture
- Geography & Climate

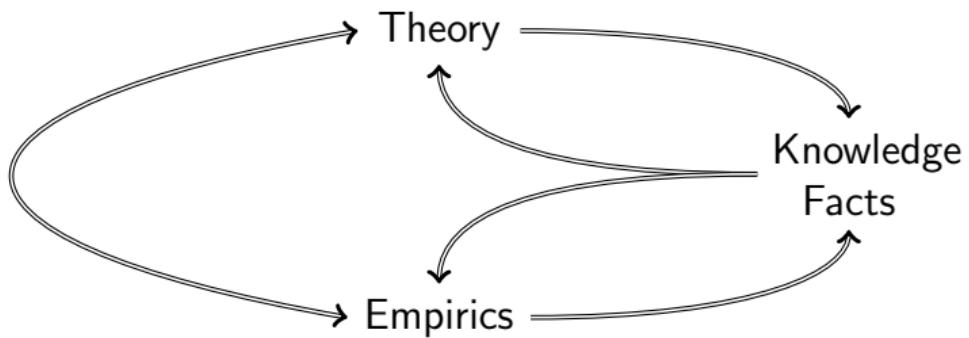
## Finding and Understanding Causes



## Finding and Understanding Causes



## Finding and Understanding Causes



## Proximate Causes of Growth

- Factor Accumulation:

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

- Technological Progress:

Technological progress is often attributed to the accumulation of knowledge and ideas.

## Proximate Causes of Growth

- Factor Accumulation:
  - Physical capital accumulation (Solow, QJE 1956)
  - Human capital accumulation (Lucas, JME 1988)
- Technological Progress:

## Proximate Causes of Growth

- Factor Accumulation:
  - Physical capital accumulation (Solow, QJE 1956)
  - Human capital accumulation (Lucas, JME 1988)
- Technological Progress:

## Proximate Causes of Growth

- Factor Accumulation:
  - Physical capital accumulation (Solow, QJE 1956)
  - Human capital accumulation (Lucas, JME 1988)
- Technological Progress:
  - Endogenous Growth (Romer, JPE 1990; Grossman-Helpman, 1991; Aghion-Howitt, ECT 1992)

## Proximate Causes of Growth

- Factor Accumulation:
  - Physical capital accumulation (Solow, QJE 1956)
  - Human capital accumulation (Lucas, JME 1988)
- Technological Progress:
  - Endogenous Growth (Romer, JPE 1990; Grossman-Helpman, 1991; Aghion-Howitt, ECT 1992)

## Neoclassical Growth Theory (GT)

- Inconsistent with the development process over most of human history:
  - GT: growth rates decline in the transition to sustained growth
    - 1000 BC – 1000 AD: 1% per year → 1% per year
    - 1000 AD – 1800 AD: 1% per year → 0.5% per year
  - GT: technological progress increases steady-state income per capita
    - 1000 BC – 1000 AD: 1% per year → 1% per year
    - 1000 AD – 1800 AD: 1% per year → 1% per year
  - GT: does not capture the demographic transition (DT)
    - 1000 BC – 1000 AD: 1% per year → 1% per year
    - 1000 AD – 1800 AD: 1% per year → 0.5% per year
  - GT: does not capture the take-off from stagnation to growth
    - 1000 BC – 1000 AD: 1% per year → 1% per year
    - 1000 AD – 1800 AD: 1% per year → 1% per year
  - GT: convergence
    - 1000 BC – 1000 AD: 1% per year → 1% per year
    - 1000 AD – 1800 AD: 1% per year → 0.5% per year

## Neoclassical Growth Theory (GT)

- Inconsistent with the development process over most of human history:
  - GT: growth rates decline in the transition to sustained growth
    - Evidence: non-decreasing growth rates in the development of DCs
  - GT: technological progress increases steady-state income per capita
    - Evidence: non-decreasing growth rates in the development of DCs
  - GT: does not capture the demographic transition (DT)
    - Evidence: non-decreasing growth rates in the development of DCs
  - GT: does not capture the take-off from stagnation to growth
    - Evidence: non-decreasing growth rates in the development of DCs
  - GT: convergence
    - Evidence: non-decreasing growth rates in the development of DCs

## Neoclassical Growth Theory (GT)

- Inconsistent with the development process over most of human history:
  - GT: growth rates decline in the transition to sustained growth
    - Evidence: non-decreasing growth rates in the development of DCs
  - GT: technological progress increases steady-state income per capita
    - Evidence: convergence of steady-state income per capita across countries
  - GT: does not capture the demographic transition (DT)
    - Evidence: population growth in developing countries
  - GT: does not capture the take-off from stagnation to growth
    - Evidence: the Industrial Revolution and the Great Divergence
  - GT: convergence
    - Evidence: convergence of steady-state income per capita across countries

## Neoclassical Growth Theory (GT)

- Inconsistent with the development process over most of human history:
  - GT: growth rates decline in the transition to sustained growth
    - Evidence: non-decreasing growth rates in the development of DCs
  - GT: technological progress increases steady-state income per capita
    - Malthusian Epoch - tech progress had no effect on LR income
  - GT: does not capture the demographic transition (DT)
    - Evidence: population growth rate declined from ~2% to ~0.1%
  - GT: does not capture the take-off from stagnation to growth
    - Evidence: stagnation in Europe until 18th century, followed by rapid growth
  - GT: convergence
    - Evidence: rich countries grow faster than poor countries

## Neoclassical Growth Theory (GT)

- Inconsistent with the development process over most of human history:
  - GT: growth rates decline in the transition to sustained growth
    - Evidence: non-decreasing growth rates in the development of DCs
  - GT: technological progress increases steady-state income per capita
    - Malthusian Epoch - tech progress had no effect on LR income
  - GT: does not capture the demographic transition (DT)
    - Evidence: population growth rate declined from ~2% to ~0.5% over last 200 years
  - GT: does not capture the take-off from stagnation to growth
    - Evidence: 100 countries stagnated for centuries before taking off
  - GT: convergence
    - Evidence: rich countries converge to similar steady-state income levels

## Neoclassical Growth Theory (GT)

- Inconsistent with the development process over most of human history:
  - GT: growth rates decline in the transition to sustained growth
    - Evidence: non-decreasing growth rates in the development of DCs
  - GT: technological progress increases steady-state income per capita
    - Malthusian Epoch - tech progress had no effect on LR income
  - GT: does not capture the demographic transition (DT)
    - Evidence: DT is central for the take-off to modern growth
  - GT: does not capture the take-off from stagnation to growth
    - Evidence: stagnation in the long run
  - GT: convergence
    - Evidence: slow growth in the long run

## Neoclassical Growth Theory (GT)

- Inconsistent with the development process over most of human history:
  - GT: growth rates decline in the transition to sustained growth
    - Evidence: non-decreasing growth rates in the development of DCs
  - GT: technological progress increases steady-state income per capita
    - Malthusian Epoch - tech progress had no effect on LR income
  - GT: does not capture the demographic transition (DT)
    - Evidence: DT is central for the take-off to modern growth
  - GT: does not capture the take-off from stagnation to growth
    - Evidence: stagnation in Europe and Japan before the Industrial Revolution
  - GT: convergence
    - Evidence: slow growth in Europe and Japan after the Industrial Revolution

## Neoclassical Growth Theory (GT)

- Inconsistent with the development process over most of human history:
  - GT: growth rates decline in the transition to sustained growth
    - Evidence: non-decreasing growth rates in the development of DCs
  - GT: technological progress increases steady-state income per capita
    - Malthusian Epoch - tech progress had no effect on LR income
  - GT: does not capture the demographic transition (DT)
    - Evidence: DT is central for the take-off to modern growth
  - GT: does not capture the take-off from stagnation to growth
    - Evidence: key for the understanding of comparative development
  - GT: convergence

Source: Acemoglu, Daron, and Anil Subramanian, 2012.

## Neoclassical Growth Theory (GT)

- Inconsistent with the development process over most of human history:
  - GT: growth rates decline in the transition to sustained growth
    - Evidence: non-decreasing growth rates in the development of DCs
  - GT: technological progress increases steady-state income per capita
    - Malthusian Epoch - tech progress had no effect on LR income
  - GT: does not capture the demographic transition (DT)
    - Evidence: DT is central for the take-off to modern growth
  - GT: does not capture the take-off from stagnation to growth
    - Evidence: key for the understanding of comparative development
  - GT: convergence

## Neoclassical Growth Theory (GT)

- Inconsistent with the development process over most of human history:
  - GT: growth rates decline in the transition to sustained growth
    - Evidence: non-decreasing growth rates in the development of DCs
  - GT: technological progress increases steady-state income per capita
    - Malthusian Epoch - tech progress had no effect on LR income
  - GT: does not capture the demographic transition (DT)
    - Evidence: DT is central for the take-off to modern growth
  - GT: does not capture the take-off from stagnation to growth
    - Evidence: key for the understanding of comparative development
  - GT: convergence
    - Evidence: divergence in the past two centuries

## Neoclassical Growth Theory (GT)

- Inconsistent with the development process over most of human history:
  - GT: growth rates decline in the transition to sustained growth
    - Evidence: non-decreasing growth rates in the development of DCs
  - GT: technological progress increases steady-state income per capita
    - Malthusian Epoch - tech progress had no effect on LR income
  - GT: does not capture the demographic transition (DT)
    - Evidence: DT is central for the take-off to modern growth
  - GT: does not capture the take-off from stagnation to growth
    - Evidence: key for the understanding of comparative development
  - GT: convergence
    - Evidence: divergence in the past two centuries

## Non-Unified Growth Theory

- Captures the role of factor accumulation and technological progress in the modern growth regime
- Not designed to shed light on:
  - The long-run dynamics of economic development
  - The reasons why some countries have grown rapidly while others have not
  - The causes of economic crises and recessions
  - The determinants of income inequality

## Non-Unified Growth Theory

- Captures the role of factor accumulation and technological progress in the modern growth regime
- Not designed to shed light on:
  - The historical origins of vast and persistent inequality across countries
  - The forces that triggered the transition of DCs from stagnation to growth
  - The hurdles faced by LDCs in their take-off from stagnation to growth
  - The factors that hindered convergence across countries

## Non-Unified Growth Theory

- Captures the role of factor accumulation and technological progress in the modern growth regime
- Not designed to shed light on:
  - The historical origins of vast and persistent inequality across countries
  - The forces that triggered the transition of DCs from stagnation to growth
  - The hurdles faced by LDCs in their take-off from stagnation to growth
  - The factors that hindered convergence across countries

## Non-Unified Growth Theory

- Captures the role of factor accumulation and technological progress in the modern growth regime
- Not designed to shed light on:
  - The historical origins of vast and persistent inequality across countries
  - The forces that triggered the transition of DCs from stagnation to growth
  - The hurdles faced by LDCs in their take-off from stagnation to growth
  - The factors that hindered convergence across countries

## Non-Unified Growth Theory

- Captures the role of factor accumulation and technological progress in the modern growth regime
- Not designed to shed light on:
  - The historical origins of vast and persistent inequality across countries
  - The forces that triggered the transition of DCs from stagnation to growth
  - The hurdles faced by LDCs in their take-off from stagnation to growth
  - The factors that hindered convergence across countries

## Non-Unified Growth Theory

- Captures the role of factor accumulation and technological progress in the modern growth regime
- Not designed to shed light on:
  - The historical origins of vast and persistent inequality across countries
  - The forces that triggered the transition of DCs from stagnation to growth
  - The hurdles faced by LDCs in their take-off from stagnation to growth
  - The factors that hindered convergence across countries

# Unified Growth Theory



## Unified Growth Theory

- Captures the:

- Process of development in its entirety
- Forces that permitted the transition from stagnation to growth
- Hurdles faced by LDCs in their transitions from stagnation to growth
- The origins of the uneven distribution of wealth across the globe
- Persistent effect of initial biogeographical factors on the growth process

## Unified Growth Theory

- Captures the:
  - Process of development in its entirety
  - Forces that permitted the transition from stagnation to growth
  - Hurdles faced by LDCs in their transitions from stagnation to growth
  - The origins of the uneven distribution of wealth across the globe
  - Persistent effect of initial biogeographical factors on the growth process

## Unified Growth Theory

- Captures the:
  - Process of development in its entirety
  - Forces that permitted the transition from stagnation to growth
  - Hurdles faced by LDCs in their transitions from stagnation to growth
  - The origins of the uneven distribution of wealth across the globe
  - Persistent effect of initial biogeographical factors on the growth process

## Unified Growth Theory

- Captures the:
  - Process of development in its entirety
  - Forces that permitted the transition from stagnation to growth
  - Hurdles faced by LDCs in their transitions from stagnation to growth
  - The origins of the uneven distribution of wealth across the globe
  - Persistent effect of initial biogeographical factors on the growth process

## Unified Growth Theory

- Captures the:
  - Process of development in its entirety
  - Forces that permitted the transition from stagnation to growth
  - Hurdles faced by LDCs in their transitions from stagnation to growth
  - The origins of the uneven distribution of wealth across the globe
  - Persistent effect of initial biogeographical factors on the growth process

## Unified Growth Theory

- Captures the:
  - Process of development in its entirety
  - Forces that permitted the transition from stagnation to growth
  - Hurdles faced by LDCs in their transitions from stagnation to growth
  - The origins of the uneven distribution of wealth across the globe
  - Persistent effect of initial biogeographical factors on the growth process

## Major Challenge - From Proximate to Fundamental Causes

- Policy based on insights from growth theory encourage
  - Investment in education and health
  - Openness to international capital markets
  - Technological diffusion
- failed to generate convergence
- Why do some societies fail to:

## Major Challenge - From Proximate to Fundamental Causes

- Policy based on insights from growth theory encourage
  - Investment in education and health
  - Openness to international capital markets
  - Technological diffusion
- failed to generate convergence
- Why do some societies fail to:

• Capital accumulation, technological progress, institutions

• Political instability, corruption, ethnic divisions

• Poor governance, lack of rule of law

• Inadequate infrastructure, lack of basic services

• Limited access to finance, market distortions

• Natural resource curse, environmental degradation

• Lack of political will, institutional reform

## Major Challenge - From Proximate to Fundamental Causes

- Policy based on insights from growth theory encourage
  - Investment in education and health
  - Openness to international capital markets
  - Technological diffusion
- ⇒ failed to generate convergence
- Why do some societies fail to:

## Major Challenge - From Proximate to Fundamental Causes

- Policy based on insights from growth theory encourage
  - Investment in education and health
  - Openness to international capital markets
  - Technological diffusion
- failed to generate convergence
- Why do some societies fail to:

## Major Challenge - From Proximate to Fundamental Causes

- Policy based on insights from growth theory encourage
  - Investment in education and health
  - Openness to international capital markets
  - Technological diffusion
- ⇒ failed to generate convergence
- Why do some societies fail to:

## Major Challenge - From Proximate to Fundamental Causes

- Policy based on insights from growth theory encourage
  - Investment in education and health
  - Openness to international capital markets
  - Technological diffusion

⇒ failed to generate convergence
- Why do some societies fail to:
  - Efficiently invest in physical and human capital?
  - Adopt advanced technologies?

## Major Challenge - From Proximate to Fundamental Causes

- Policy based on insights from growth theory encourage
  - Investment in education and health
  - Openness to international capital markets
  - Technological diffusion
- ⇒ failed to generate convergence
- Why do some societies fail to:
  - Efficiently invest in physical and human capital?
  - Adopt advanced technologies?

## Major Challenge - From Proximate to Fundamental Causes

- Policy based on insights from growth theory encourage
  - Investment in education and health
  - Openness to international capital markets
  - Technological diffusion
- ⇒ 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

→ Capital accumulation is lower than its optimal level due to unequal access to resources.

→ Capital accumulation is lower than its optimal level due to unequal access to resources.

→ Capital accumulation is lower than its optimal level due to unequal access to resources.

- Inefficient Institutions (limited protection of property rights & rule of law)

→ Capital accumulation is lower than its optimal level due to inefficient institutions.

- Ethnic fractionalization

→ Capital accumulation is lower than its optimal level due to ethnic fractionalization.

- Limited Social capital (limited trust & cooperation)

→ Capital accumulation is lower than its optimal level due to limited social capital.

## Barriers to Accumulation and Innovation

- Inequality

- Suboptimal accumulation of human and physical capital

- Credit market imperfections (Galor-Zeira, RES 1993)
    - Sociopolitical instability (Alesina et al., JEG 1996)
    - Inferior institutions (Engerman-Sokoloff, 1997)
    - Inefficient provision of education (Galor-Moav-Vollrath, RES 2009)

- Inefficient Institutions (limited protection of property rights & rule of law)

→ Incentives for innovation and accumulation are undermined by corruption and political instability.

- Ethnic fractionalization

→ Incentives for innovation and accumulation are undermined by ethnic conflict and discrimination.

- Limited Social capital (limited trust & cooperation)

→ Incentives for innovation and accumulation are undermined by lack of social cohesion and norms.

## Barriers to Accumulation and Innovation

- Inequality
  - Suboptimal accumulation of human and physical capital
    - Credit market imperfections (Galor-Zeira, RES 1993)
    - Sociopolitical instability (Alesina et al., JEG 1996)
    - Inferior institutions (Engerman-Sokoloff, 1997)
    - Inefficient provision of education (Galor-Moav-Vollrath, RES 2009)
  - Inefficient Institutions (limited protection of property rights & rule of law)  
↳ Incentives for innovation and accumulation are undermined by corruption and political instability.
  - Ethnic fractionalization  
↳ Incentives for innovation and accumulation are undermined by ethnic conflict and discrimination.
  - Limited Social capital (limited trust & cooperation)  
↳ Incentives for innovation and accumulation are undermined by lack of social cohesion and norms.

## Barriers to Accumulation and Innovation

- Inequality
  - Suboptimal accumulation of human and physical capital
    - Credit market imperfections (Galor-Zeira, RES 1993)
    - Sociopolitical instability (Alesina et al., JEG 1996)
    - Inferior institutions (Engerman-Sokoloff, 1997)
    - Inefficient provision of education (Galor-Moav-Vollrath, RES 2009)
- Inefficient Institutions (limited protection of property rights & rule of law)
  - Inadequate property rights (Acemoglu-Darling, 2001)
  - Rule of law (Acemoglu-Darling, 2001)
- Ethnic fractionalization
  - Inadequate ethnic group representation in government (Acemoglu-Darling, 2001)
  - Inadequate ethnic group representation in economy (Acemoglu-Darling, 2001)
- Limited Social capital (limited trust & cooperation)
  - Inadequate social capital (Acemoglu-Darling, 2001)

## Barriers to Accumulation and Innovation

- Inequality
  - Suboptimal accumulation of human and physical capital
    - Credit market imperfections (Galor-Zeira, RES 1993)
    - Sociopolitical instability (Alesina et al., JEG 1996)
    - Inferior institutions (Engerman-Sokoloff, 1997)
    - Inefficient provision of education (Galor-Moav-Vollrath, RES 2009)
- Inefficient Institutions (limited protection of property rights & rule of law)
  - Inadequate property rights (Galor-Gómez-Noguera, JEG 2009)
- Ethnic fractionalization
  - Inadequate ethnic group cooperation (Acemoglu-Dixit, JEG 2009)
- Limited Social capital (limited trust & cooperation)
  - Inadequate social capital (Acemoglu-Dixit, JEG 2009)

## Barriers to Accumulation and Innovation

- Inequality
  - Suboptimal accumulation of human and physical capital
    - Credit market imperfections (Galor-Zeira, RES 1993)
    - Sociopolitical instability (Alesina et al., JEG 1996)
    - Inferior institutions (Engerman-Sokoloff, 1997)
    - Inefficient provision of education (Galor-Moav-Vollrath, RES 2009)
- Inefficient Institutions (limited protection of property rights & rule of law)
  - Incomplete contracts, corruption, lack of accountability, and lack of rule of law
- Ethnic fractionalization
  - High levels of ethnic fractionalization can lead to political instability, conflict, and economic inefficiency
- Limited Social capital (limited trust & cooperation)
  - Lack of social capital can limit the effectiveness of markets and governments

## Barriers to Accumulation and Innovation

- Inequality

- Suboptimal accumulation of human and physical capital

- Credit market imperfections (Galor-Zeira, RES 1993)

- Sociopolitical instability (Alesina et al., JEG 1996)

- Inferior institutions (Engerman-Sokoloff, 1997)

- Inefficient provision of education (Galor-Moav-Vollrath, RES 2009)

- Inefficient Institutions (limited protection of property rights & rule of law)

- Reduced incentive to accumulate/innovate (North, 1981; Acemoglu-Robinson, 2012)

- Ethnic fractionalization

- Reduced incentives to accumulate/innovate due to ethnic conflict and discrimination

- Limited Social capital (limited trust & cooperation)

- Reduced incentives to accumulate/innovate due to lack of social trust and cooperation

## Barriers to Accumulation and Innovation

- Inequality
  - Suboptimal accumulation of human and physical capital
    - Credit market imperfections (Galor-Zeira, RES 1993)
    - Sociopolitical instability (Alesina et al., JEG 1996)
    - Inferior institutions (Engerman-Sokoloff, 1997)
    - Inefficient provision of education (Galor-Moav-Vollrath, RES 2009)
  - Inefficient Institutions (limited protection of property rights & rule of law)
    - Reduced incentive to accumulate/innovate (North, 1981; Acemoglu-Robinson, 2012)
  - Ethnic fractionalization

## Barriers to Accumulation and Innovation

- Inequality
  - Suboptimal accumulation of human and physical capital
    - Credit market imperfections (Galor-Zeira, RES 1993)
    - Sociopolitical instability (Alesina et al., JEG 1996)
    - Inferior institutions (Engerman-Sokoloff, 1997)
    - Inefficient provision of education (Galor-Moav-Vollrath, RES 2009)
  - 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
  - Limited Social capital (limited trust & cooperation)

## Barriers to Accumulation and Innovation

- Inequality
  - Suboptimal accumulation of human and physical capital
    - Credit market imperfections (Galor-Zeira, RES 1993)
    - Sociopolitical instability (Alesina et al., JEG 1996)
    - Inferior institutions (Engerman-Sokoloff, 1997)
    - Inefficient provision of education (Galor-Moav-Vollrath, RES 2009)
  - 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
      - Suboptimal investment (Easterly-Levine, QJE 1997; Alesina et al., JEG 2003)
  - Limited Social capital (limited trust & cooperation)

## Barriers to Accumulation and Innovation

- Inequality
  - Suboptimal accumulation of human and physical capital
    - Credit market imperfections (Galor-Zeira, RES 1993)
    - Sociopolitical instability (Alesina et al., JEG 1996)
    - Inferior institutions (Engerman-Sokoloff, 1997)
    - Inefficient provision of education (Galor-Moav-Vollrath, RES 2009)
  - 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
      - Suboptimal investment (Easterly-Levine, QJE 1997; Alesina et al., JEG 2003)
  - Limited Social capital (limited trust & cooperation)

## Barriers to Accumulation and Innovation

- Inequality
  - Suboptimal accumulation of human and physical capital
    - Credit market imperfections (Galor-Zeira, RES 1993)
    - Sociopolitical instability (Alesina et al., JEG 1996)
    - Inferior institutions (Engerman-Sokoloff, 1997)
    - Inefficient provision of education (Galor-Moav-Vollrath, RES 2009)
  - 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
      - Suboptimal investment (Easterly-Levine, QJE 1997; Alesina et al., JEG 2003)
  - Limited Social capital (limited trust & cooperation)
    - Suboptimal investment (Putnam, 1993; Guiso et al., JEP 2006; Tabellini, JEEA 2010)

## Barriers to Accumulation and Innovation

- Inequality
  - Suboptimal accumulation of human and physical capital
    - Credit market imperfections (Galor-Zeira, RES 1993)
    - Sociopolitical instability (Alesina et al., JEG 1996)
    - Inferior institutions (Engerman-Sokoloff, 1997)
    - Inefficient provision of education (Galor-Moav-Vollrath, RES 2009)
  - 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
      - Suboptimal investment (Easterly-Levine, QJE 1997; Alesina et al., JEG 2003)
  - Limited Social capital (limited trust & cooperation)
    - Suboptimal investment (Putnam, 1993; Guiso et al., JEP 2006; Tabellini, JEEA 2010)

## Colonialism and the Persistent Effects of Institutions and Human Capital

- Persistent effect of institutions implemented by colonial powers
    - Reversal of fortune (Engerman-Sokoloff, 1997; Acemoglu et al., AER 2001, QJE 2002)
      - The introduction of new institutions can reverse centuries-old patterns of economic development
    - Slavery (Nunn, QJE 2008)
      - Slaveholding colonies had lower levels of economic development than non-slaveholding colonies
  - Persistent effect of the human capital and diversity brought by the colonists
    - Colonization led to significant increases in the level of education and skills in the colonies
  - Persistent effect of the legal system of colonial powers
    - The legal systems of former colonies often reflect the legal traditions of their colonizers
  - Persistent effect of artificial borders & ethnic division created by colonists

## Colonialism and the Persistent Effects of Institutions and Human Capital

- Persistent effect of institutions implemented by colonial powers
  - Reversal of fortune (Engerman-Sokoloff, 1997; Acemoglu et al., AER 2001, QJE 2002)
    - Exclusive institutions imposed in densely populated areas
    - Inclusive institutions implemented in sparsely populated areas
  - Slavery (Nunn, QJE 2008)
- Persistent effect of the human capital and diversity brought by the colonists
  - Slave trade & colonialism increased the share of slaves in the population, which had long-term negative effects on economic development (Acemoglu et al., 2008)
- Persistent effect of the legal system of colonial powers
  - Slave codes & colonial legal systems imposed by colonists were often harsh and discriminatory, leading to long-term negative effects on economic development (Acemoglu et al., 2008)
- Persistent effect of artificial borders & ethnic division created by colonists
  - Colonial borders often did not respect ethnic or linguistic divisions, creating artificial ethnic groups and dividing populations, which has had long-term negative effects on economic development (Acemoglu et al., 2008)

## Colonialism and the Persistent Effects of Institutions and Human Capital

- Persistent effect of institutions implemented by colonial powers
  - Reversal of fortune (Engerman-Sokoloff, 1997; Acemoglu et al., AER 2001, QJE 2002)
    - Exclusive institutions imposed in densely populated areas
    - Inclusive institutions implemented in sparsely populated areas
  - Slavery (Nunn, QJE 2008)
- Persistent effect of the human capital and diversity brought by the colonists
  - Slave trade & colonialism increased the share of slaves in the population, which had long-term negative effects on economic development.
- Persistent effect of the legal system of colonial powers
  - Slave codes and other laws imposed by colonists were often harsh and discriminatory, leading to long-term social and economic inequality.
- Persistent effect of artificial borders & ethnic division created by colonists
  - Colonists often drew arbitrary borders that divided ethnic groups, creating political and economic divisions that persist to this day.

## Colonialism and the Persistent Effects of Institutions and Human Capital

- Persistent effect of institutions implemented by colonial powers
  - Reversal of fortune (Engerman-Sokoloff, 1997; Acemoglu et al., AER 2001, QJE 2002)
    - Exclusive institutions imposed in densely populated areas
    - Inclusive institutions implemented in sparsely populated areas
  - Slavery (Nunn, QJE 2008)
- Persistent effect of the human capital and diversity brought by the colonists
  - Slave trade & colonialism increased the number of slaves in Africa, leading to a significant increase in the African population.
  - Slave trade & colonialism increased the number of slaves in Africa, leading to a significant increase in the African population.
- Persistent effect of the legal system of colonial powers
  - Slave trade & colonialism increased the number of slaves in Africa, leading to a significant increase in the African population.
  - Slave trade & colonialism increased the number of slaves in Africa, leading to a significant increase in the African population.
- Persistent effect of artificial borders & ethnic division created by colonists
  - Slave trade & colonialism increased the number of slaves in Africa, leading to a significant increase in the African population.
  - Slave trade & colonialism increased the number of slaves in Africa, leading to a significant increase in the African population.

## Colonialism and the Persistent Effects of Institutions and Human Capital

- Persistent effect of institutions implemented by colonial powers
  - Reversal of fortune (Engerman-Sokoloff, 1997; Acemoglu et al., AER 2001, QJE 2002)
    - Exclusive institutions imposed in densely populated areas
    - Inclusive institutions implemented in sparsely populated areas
  - Slavery (Nunn, QJE 2008)
- Persistent effect of the human capital and diversity brought by the colonists
  - Slave trade (Acemoglu et al., 2001; Nunn, 2008)
  - Migration (Acemoglu et al., 2001; Nunn, 2008)
- Persistent effect of the legal system of colonial powers
  - Slave codes (Acemoglu et al., 2001; Nunn, 2008)
  - Property rights (Acemoglu et al., 2001; Nunn, 2008)
- Persistent effect of artificial borders & ethnic division created by colonists
  - Ethnic divisions (Acemoglu et al., 2001; Nunn, 2008)
  - Artificial borders (Acemoglu et al., 2001; Nunn, 2008)

## Colonialism and the Persistent Effects of Institutions and Human Capital

- Persistent effect of institutions implemented by colonial powers
  - Reversal of fortune (Engerman-Sokoloff, 1997; Acemoglu et al., AER 2001, QJE 2002)
    - Exclusive institutions imposed in densely populated areas
    - Inclusive institutions implemented in sparsely populated areas
  - Slavery (Nunn, QJE 2008)
- Persistent effect of the human capital and diversity brought by the colonists
  - Larger effect of colonizers in sparsely populated areas (Glaeser et al., JEG 2004; Easterly-Levine, 2012; Ashraf-Galor, 2014)
- Persistent effect of the legal system of colonial powers
  - Legal system of the colonizers imposed on the colonies
  - Colonizers imposed their legal system on the colonies
- Persistent effect of artificial borders & ethnic division created by colonists
  - Colonizers imposed their legal system on the colonies
  - Colonizers imposed their legal system on the colonies

## Colonialism and the Persistent Effects of Institutions and Human Capital

- Persistent effect of institutions implemented by colonial powers
  - Reversal of fortune (Engerman-Sokoloff, 1997; Acemoglu et al., AER 2001, QJE 2002)
    - Exclusive institutions imposed in densely populated areas
    - Inclusive institutions implemented in sparsely populated areas
  - Slavery (Nunn, QJE 2008)
- Persistent effect of the human capital and diversity brought by the colonists
  - Larger effect of colonizers in sparsely populated areas (Glaeser et al., JEG 2004; Easterly-Levine, 2012; Ashraf-Galor, 2014)
- Persistent effect of the legal system of colonial powers
- Persistent effect of artificial borders & ethnic division created by colonists

## Colonialism and the Persistent Effects of Institutions and Human Capital

- Persistent effect of institutions implemented by colonial powers
  - Reversal of fortune (Engerman-Sokoloff, 1997; Acemoglu et al., AER 2001, QJE 2002)
    - Exclusive institutions imposed in densely populated areas
    - Inclusive institutions implemented in sparsely populated areas
  - Slavery (Nunn, QJE 2008)
- Persistent effect of the human capital and diversity brought by the colonists
  - Larger effect of colonizers in sparsely populated areas (Glaeser et al., JEG 2004; Easterly-Levine, 2012; Ashraf-Galor, 2014)
- Persistent effect of the legal system of colonial powers
  - Common law (Britain) is more complementary than civil law (France, Spain & Portugal) to the development of financial systems (La Porta et al., JF 1997)
- Persistent effect of artificial borders & ethnic division created by colonists

## Colonialism and the Persistent Effects of Institutions and Human Capital

- Persistent effect of institutions implemented by colonial powers
  - Reversal of fortune (Engerman-Sokoloff, 1997; Acemoglu et al., AER 2001, QJE 2002)
    - Exclusive institutions imposed in densely populated areas
    - Inclusive institutions implemented in sparsely populated areas
  - Slavery (Nunn, QJE 2008)
- Persistent effect of the human capital and diversity brought by the colonists
  - Larger effect of colonizers in sparsely populated areas (Glaeser et al., JEG 2004; Easterly-Levine, 2012; Ashraf-Galor, 2014)
- Persistent effect of the legal system of colonial powers
  - Common law (Britain) is more complementary than civil law (France, Spain & Portugal) to the development of financial systems (La Porta et al., JF 1997)
- Persistent effect of artificial borders & ethnic division created by colonists

## Colonialism and the Persistent Effects of Institutions and Human Capital

- Persistent effect of institutions implemented by colonial powers
  - Reversal of fortune (Engerman-Sokoloff, 1997; Acemoglu et al., AER 2001, QJE 2002)
    - Exclusive institutions imposed in densely populated areas
    - Inclusive institutions implemented in sparsely populated areas
  - Slavery (Nunn, QJE 2008)
- Persistent effect of the human capital and diversity brought by the colonists
  - Larger effect of colonizers in sparsely populated areas (Glaeser et al., JEG 2004; Easterly-Levine, 2012; Ashraf-Galor, 2014)
- Persistent effect of the legal system of colonial powers
  - Common law (Britain) is more complementary than civil law (France, Spain & Portugal) to the development of financial systems (La Porta et al., JF 1997)
- Persistent effect of artificial borders & ethnic division created by colonists
  - Sub-Saharan Africa (Alesina et al., JEEA 2011; Papaioannou-Michalopoulos, ECT 2012)

## Colonialism and the Persistent Effects of Institutions and Human Capital

- Persistent effect of institutions implemented by colonial powers
  - Reversal of fortune (Engerman-Sokoloff, 1997; Acemoglu et al., AER 2001, QJE 2002)
    - Exclusive institutions imposed in densely populated areas
    - Inclusive institutions implemented in sparsely populated areas
  - Slavery (Nunn, QJE 2008)
- Persistent effect of the human capital and diversity brought by the colonists
  - Larger effect of colonizers in sparsely populated areas (Glaeser et al., JEG 2004; Easterly-Levine, 2012; Ashraf-Galor, 2014)
- Persistent effect of the legal system of colonial powers
  - Common law (Britain) is more complementary than civil law (France, Spain & Portugal) to the development of financial systems (La Porta et al., JF 1997)
- Persistent effect of artificial borders & ethnic division created by colonists
  - Sub-Saharan Africa (Alesina et al., JEEA 2011; Papaioannou-Michalopoulos, ECT 2012)

## Origin and Persistence of Cultural Factors

- Geographical origins and persistence of:

- Trust & Cooperation (Guiso et al., QJE 2009; Algan-Cahuc, AER 2010; Durante, 2010; Litina, 2016)
- Cultural diversity (Ashraf-Galor, 2012)
- The European Marriage Pattern (Voigtlander-Voth, AER 2013)
- Female labor force participation (Alesina et al., QJE 2013)
- Time preference (Galor and Özak, AER 2016)

- Religious origins of:

- Protestant work ethic (Fagerberg, 1994; Acemoglu-Dar Zusman, 2012)
- Religious tolerance (Acemoglu-Dar Zusman, 2012)

- Intergenerational transmission of:

- Religious beliefs (Acemoglu-Dar Zusman, 2012)
- Social norms (Acemoglu-Dar Zusman, 2012)
- Cultural values (Acemoglu-Dar Zusman, 2012)

## Origin and Persistence of Cultural Factors

- Geographical origins and persistence of:
  - Trust & Cooperation (Guiso et al., QJE 2009; Algan-Cahuc, AER 2010; Durante, 2010; Litina, 2016)
  - Cultural diversity (Ashraf-Galor, 2012)
  - The European Marriage Pattern (Voigtlander-Voth, AER 2013)
  - Female labor force participation (Alesina et al., QJE 2013)
  - Time preference (Galor and Özak, AER 2016)

- Religious origins of:
  - Religious beliefs and practices
  - Religious institutions and their role in society

- Intergenerational transmission of:
  - Cultural values and norms
  - Religious beliefs and practices

## Origin and Persistence of Cultural Factors

- Geographical origins and persistence of:
  - Trust & Cooperation (Guiso et al., QJE 2009; Algan-Cahuc, AER 2010; Durante, 2010; Litina, 2016)
  - Cultural diversity (Ashraf-Galor, 2012)
  - The European Marriage Pattern (Voigtlander-Voth, AER 2013)
  - Female labor force participation (Alesina et al., QJE 2013)
  - Time preference (Galor and Özak, AER 2016)

- Religious origins of:
  - Protestant work ethic (Fagerberg, 1994)
  - Religious tolerance (Galor and Weil, 2006)
  - Religious heterogeneity (Galor and Weil, 2006)

- Intergenerational transmission of:
  - Religious beliefs (Galor and Weil, 2006)
  - Religious tolerance (Galor and Weil, 2006)
  - Religious heterogeneity (Galor and Weil, 2006)

## Origin and Persistence of Cultural Factors

- Geographical origins and persistence of:
  - Trust & Cooperation (Guiso et al., QJE 2009; Algan-Cahuc, AER 2010; Durante, 2010; Litina, 2016)
  - Cultural diversity (Ashraf-Galor, 2012)
  - The European Marriage Pattern (Voigtlander-Voth, AER 2013)
  - Female labor force participation (Alesina et al., QJE 2013)
  - Time preference (Galor and Özak, AER 2016)
- Religious origins of:
  - Protestant work ethic (Fagerberg, 1994)
  - Religious intensity (Acemoglu et al., 2015)

- Intergenerational transmission of:
  - Religious beliefs (Acemoglu et al., 2015)
  - Cultural traits (Beck et al., 2015)

## Origin and Persistence of Cultural Factors

- Geographical origins and persistence of:
  - Trust & Cooperation (Guiso et al., QJE 2009; Algan-Cahuc, AER 2010; Durante, 2010; Litina, 2016)
  - Cultural diversity (Ashraf-Galor, 2012)
  - The European Marriage Pattern (Voigtlander-Voth, AER 2013)
  - Female labor force participation (Alesina et al., QJE 2013)
  - Time preference (Galor and Özak, AER 2016)
- Religious origins of:
  - Religious tolerance (Acemoglu and Angrist, 2011)
  - Religious intensity (Acemoglu and Angrist, 2011)
  - Religious heterogeneity (Acemoglu and Angrist, 2011)
- Intergenerational transmission of:
  - Religious tolerance (Acemoglu and Angrist, 2011)
  - Religious intensity (Acemoglu and Angrist, 2011)
  - Religious heterogeneity (Acemoglu and Angrist, 2011)

## Origin and Persistence of Cultural Factors

- Geographical origins and persistence of:
  - Trust & Cooperation (Guiso et al., QJE 2009; Algan-Cahuc, AER 2010; Durante, 2010; Litina, 2016)
  - Cultural diversity (Ashraf-Galor, 2012)
  - The European Marriage Pattern (Voigtlander-Voth, AER 2013)
  - Female labor force participation (Alesina et al., QJE 2013)
  - Time preference (Galor and Özak, AER 2016)

- Religious origins of:

- Intergenerational transmission of:

## Origin and Persistence of Cultural Factors

- Geographical origins and persistence of:
  - Trust & Cooperation (Guiso et al., QJE 2009; Algan-Cahuc, AER 2010; Durante, 2010; Litina, 2016)
  - Cultural diversity (Ashraf-Galor, 2012)
  - The European Marriage Pattern (Voigtlander-Voth, AER 2013)
  - Female labor force participation (Alesina et al., QJE 2013)
  - Time preference (Galor and Özak, AER 2016)
- Religious origins of:
  - Preferences for human capital (Becker-Woessmann, QJE 2009; Botticini-Eckstein, 2012)
  - Work ethic & thrift & entrepreneurial spirit (Weber, 1905; Andersen et al., 2013)
- Intergenerational transmission of:
  - Religious transmission (Botticini-Eckstein, 2012)
  - Cultural transmission (Guiso et al., 2009)
  - Economic transmission (Galor and Özak, 2016)

## Origin and Persistence of Cultural Factors

- Geographical origins and persistence of:
  - Trust & Cooperation (Guiso et al., QJE 2009; Algan-Cahuc, AER 2010; Durante, 2010; Litina, 2016)
  - Cultural diversity (Ashraf-Galor, 2012)
  - The European Marriage Pattern (Voigtlander-Voth, AER 2013)
  - Female labor force participation (Alesina et al., QJE 2013)
  - Time preference (Galor and Özak, AER 2016)
- Religious origins of:
  - Preferences for human capital (Becker-Woessmann, QJE 2009; Botticini-Eckstein, 2012)
  - Work ethic & thrift & entrepreneurial spirit (Weber, 1905; Andersen et al., 2013)
- Intergenerational transmission of:

## Origin and Persistence of Cultural Factors

- Geographical origins and persistence of:
  - Trust & Cooperation (Guiso et al., QJE 2009; Algan-Cahuc, AER 2010; Durante, 2010; Litina, 2016)
  - Cultural diversity (Ashraf-Galor, 2012)
  - The European Marriage Pattern (Voigtlander-Voth, AER 2013)
  - Female labor force participation (Alesina et al., QJE 2013)
  - Time preference (Galor and Özak, AER 2016)
- Religious origins of:
  - Preferences for human capital (Becker-Woessmann, QJE 2009; Botticini-Eckstein, 2012)
  - Work ethic & thrift & entrepreneurial spirit (Weber, 1905; Andersen et al., 2013)
- Intergenerational transmission of:

## Origin and Persistence of Cultural Factors

- Geographical origins and persistence of:
  - Trust & Cooperation (Guiso et al., QJE 2009; Algan-Cahuc, AER 2010; Durante, 2010; Litina, 2016)
  - Cultural diversity (Ashraf-Galor, 2012)
  - The European Marriage Pattern (Voigtlander-Voth, AER 2013)
  - Female labor force participation (Alesina et al., QJE 2013)
  - Time preference (Galor and Özak, AER 2016)
- Religious origins of:
  - Preferences for human capital (Becker-Woessmann, QJE 2009; Botticini-Eckstein, 2012)
  - Work ethic & thrift & entrepreneurial spirit (Weber, 1905; Andersen et al., 2013)
- Intergenerational transmission of:
  - Preferences for human capital (Galor-Moav, QJE 2002)
  - Entrepreneurial spirit & thrift (Deopke-Zilibotti, QJE 2008; Galor-Michalopoulos, JET 2012)
  - Time preference (Galor and Özak, AER 2016)

## Origin and Persistence of Cultural Factors

- Geographical origins and persistence of:
  - Trust & Cooperation (Guiso et al., QJE 2009; Algan-Cahuc, AER 2010; Durante, 2010; Litina, 2016)
  - Cultural diversity (Ashraf-Galor, 2012)
  - The European Marriage Pattern (Voigtlander-Voth, AER 2013)
  - Female labor force participation (Alesina et al., QJE 2013)
  - Time preference (Galor and Özak, AER 2016)
- Religious origins of:
  - Preferences for human capital (Becker-Woessmann, QJE 2009; Botticini-Eckstein, 2012)
  - Work ethic & thrift & entrepreneurial spirit (Weber, 1905; Andersen et al., 2013)
- Intergenerational transmission of:
  - Preferences for human capital (Galor-Moav, QJE 2002)
  - Entrepreneurial spirit & thrift (Deopke-Zilibotti, QJE 2008; Galor-Michalopoulos, JET 2012)
  - Time preference (Galor and Özak, AER 2016)

## Origin and Persistence of Cultural Factors

- Geographical origins and persistence of:
  - Trust & Cooperation (Guiso et al., QJE 2009; Algan-Cahuc, AER 2010; Durante, 2010; Litina, 2016)
  - Cultural diversity (Ashraf-Galor, 2012)
  - The European Marriage Pattern (Voigtlander-Voth, AER 2013)
  - Female labor force participation (Alesina et al., QJE 2013)
  - Time preference (Galor and Özak, AER 2016)
- Religious origins of:
  - Preferences for human capital (Becker-Woessmann, QJE 2009; Botticini-Eckstein, 2012)
  - Work ethic & thrift & entrepreneurial spirit (Weber, 1905; Andersen et al., 2013)
- Intergenerational transmission of:
  - Preferences for human capital (Galor-Moav, QJE 2002)
  - Entrepreneurial spirit & thrift (Deopke-Zilibotti, QJE 2008; Galor-Michalopoulos, JET 2012)
  - Time preference (Galor and Özak, AER 2016)

## Origin and Persistence of Cultural Factors

- Geographical origins and persistence of:
  - Trust & Cooperation (Guiso et al., QJE 2009; Algan-Cahuc, AER 2010; Durante, 2010; Litina, 2016)
  - Cultural diversity (Ashraf-Galor, 2012)
  - The European Marriage Pattern (Voigtlander-Voth, AER 2013)
  - Female labor force participation (Alesina et al., QJE 2013)
  - Time preference (Galor and Özak, AER 2016)
- Religious origins of:
  - Preferences for human capital (Becker-Woessmann, QJE 2009; Botticini-Eckstein, 2012)
  - Work ethic & thrift & entrepreneurial spirit (Weber, 1905; Andersen et al., 2013)
- Intergenerational transmission of:
  - Preferences for human capital (Galor-Moav, QJE 2002)
  - Entrepreneurial spirit & thrift (Deopke-Zilibotti, QJE 2008; Galor-Michalopoulos, JET 2012)
  - Time preference (Galor and Özak, AER 2016)

## Persistent Effects of Geographical Factors

- Biogeographical conditions that triggered the Neolithic Revolution

- Technological head-start: (Diamond, 1997; Olsson-Hibbs, EER, 2005)

Geographical factors like latitude, rainfall, and soil quality influenced the development of agriculture and animal husbandry.

- Persistent effect on life expectancy (Galor-Moav, 2009; Franck-Galor-Özak, 2019)

- Disease environment

Geographical factors like latitude, rainfall, and soil quality influenced the development of agriculture and animal husbandry.

Geographical isolation from disease reservoirs led to lower mortality rates.

- Geographical isolation

Geographical factors like latitude, rainfall, and soil quality influenced the development of agriculture and animal husbandry.

Geographical isolation from disease reservoirs led to lower mortality rates.

## Persistent Effects of Geographical Factors

- Biogeographical conditions that triggered the Neolithic Revolution

- Technological head-start: (Diamond, 1997; Olsson-Hibbs, EER, 2005)

- Persistent effect on population density (1-1500) (Ashraf-Galor, AER 2011)

- No effect on contemporary income per capita (Ashraf-Galor, AER 2013)

- Persistent effect on life expectancy (Galor-Moav, 2009; Franck-Galor-Özak, 2019)

- Disease environment

- Geographic environment influences disease environment, which in turn influences economic development.

- Geographic environment influences disease environment, which in turn influences economic development.

- Geographical isolation

- Geographic isolation influences disease environment, which in turn influences economic development.

- Geographic isolation influences disease environment, which in turn influences economic development.

## Persistent Effects of Geographical Factors

- Biogeographical conditions that triggered the Neolithic Revolution
  - Technological head-start: (Diamond, 1997; Olsson-Hibbs, EER, 2005)
    - Persistent effect on population density (1-1500) (Ashraf-Galor, AER 2011)
    - No effect on contemporary income per capita (Ashraf-Galor, AER 2013)
  - Persistent effect on life expectancy (Galor-Moav, 2009; Franck-Galor-Özak, 2019)

- Disease environment

Geographical factors have been shown to have a significant impact on disease environments. Diseases such as malaria, cholera, and tuberculosis have had a profound impact on human health and development. These diseases are often associated with specific geographical regions and have shaped the course of history through their effects on population density, migration patterns, and technological development.

- Geographical isolation

Geographical isolation has been shown to have both positive and negative effects on economic development. On the one hand, it can provide a degree of protection from external influences and allow for the development of unique cultural and economic traditions. On the other hand, it can also limit access to markets, technology, and information, which can hinder economic growth and development.

## Persistent Effects of Geographical Factors

- Biogeographical conditions that triggered the Neolithic Revolution
  - Technological head-start: (Diamond, 1997; Olsson-Hibbs, EER, 2005)
    - Persistent effect on population density (1-1500) (Ashraf-Galor, AER 2011)
    - No effect on contemporary income per capita (Ashraf-Galor, AER 2013)
  - Persistent effect on life expectancy (Galor-Moav, 2009; Franck-Galor-Özak, 2019)

- Disease environment

Geographical factors have been shown to have a significant impact on disease environments, particularly in terms of the incidence and prevalence of various diseases.

- Geographical isolation

Geographical isolation has been linked to slower technological progress and lower levels of economic development.

Geographical isolation can lead to a lack of access to information, markets, and resources, which can limit economic opportunities and growth.

## Persistent Effects of Geographical Factors

- Biogeographical conditions that triggered the Neolithic Revolution
  - Technological head-start: (Diamond, 1997; Olsson-Hibbs, EER, 2005)
    - Persistent effect on population density (1-1500) (Ashraf-Galor, AER 2011)
    - No effect on contemporary income per capita (Ashraf-Galor, AER 2013)
  - Persistent effect on life expectancy (Galor-Moav, 2009; Franck-Galor-Özak, 2019)

### ● Disease environment

Geographical factors have been shown to have a significant impact on disease environments, which in turn influence economic development.

### ● Geographical isolation

Geographical isolation has been shown to have a significant impact on economic development, particularly through its effects on trade and technological diffusion.

## Persistent Effects of Geographical Factors

- Biogeographical conditions that triggered the Neolithic Revolution
  - Technological head-start: (Diamond, 1997; Olsson-Hibbs, EER, 2005)
    - Persistent effect on population density (1-1500) (Ashraf-Galor, AER 2011)
    - No effect on contemporary income per capita (Ashraf-Galor, AER 2013)
  - Persistent effect on life expectancy (Galor-Moav, 2009; Franck-Galor-Özak, 2019)
- Disease environment
  - Persistent effect on labor productivity & investment in human capital (Gallup-Sachs, 2001; Andersen-Dalgaard-Selmay, REStud 2012; Alsan AER 2015)
- Geographical isolation
  - Isolation from other civilizations has led to slower technological progress and lower income levels (Acemoglu-Angrist-Pischke, 2012; Acemoglu-Angrist-Pischke, 2015)

## Persistent Effects of Geographical Factors

- Biogeographical conditions that triggered the Neolithic Revolution
  - Technological head-start: (Diamond, 1997; Olsson-Hibbs, EER, 2005)
    - Persistent effect on population density (1-1500) (Ashraf-Galor, AER 2011)
    - No effect on contemporary income per capita (Ashraf-Galor, AER 2013)
  - Persistent effect on life expectancy (Galor-Moav, 2009; Franck-Galor-Özak, 2019)
- Disease environment
  - Persistent effect on labor productivity & investment in human capital (Gallup-Sachs, 2001; Andersen-Dalgaard-Selmay, REStud 2012; Alsan AER 2015)
- Geographical isolation

## Persistent Effects of Geographical Factors

- Biogeographical conditions that triggered the Neolithic Revolution
  - Technological head-start: (Diamond, 1997; Olsson-Hibbs, EER, 2005)
    - Persistent effect on population density (1-1500) (Ashraf-Galor, AER 2011)
    - No effect on contemporary income per capita (Ashraf-Galor, AER 2013)
  - Persistent effect on life expectancy (Galor-Moav, 2009; Franck-Galor-Özak, 2019)
- Disease environment
  - Persistent effect on labor productivity & investment in human capital (Gallup-Sachs, 2001; Andersen-Dalgaard-Selmay, REStud 2012; Alsan AER 2015)
- Geographical isolation
  - Reduced trade and technological diffusion (Gallup-Mellinger-Sachs, 1999)
  - Persistence of culture conducive for innovations (Ashraf-Galor-Özak, JEEA 2010; Özak, JOEG 2018)

## Persistent Effects of Geographical Factors

- Biogeographical conditions that triggered the Neolithic Revolution
  - Technological head-start: (Diamond, 1997; Olsson-Hibbs, EER, 2005)
    - Persistent effect on population density (1-1500) (Ashraf-Galor, AER 2011)
    - No effect on contemporary income per capita (Ashraf-Galor, AER 2013)
  - Persistent effect on life expectancy (Galor-Moav, 2009; Franck-Galor-Özak, 2019)
- Disease environment
  - Persistent effect on labor productivity & investment in human capital (Gallup-Sachs, 2001; Andersen-Dalgaard-Selmay, REStud 2012; Alsan AER 2015)
- Geographical isolation
  - Reduced trade and technological diffusion (Gallup-Mellinger-Sachs, 1999)
  - Persistence of culture conducive for innovations (Ashraf-Galor-Özak, JEEA 2010; Özak, JOEG 2018)

## Persistent Effects of Geographical Factors

- Biogeographical conditions that triggered the Neolithic Revolution
  - Technological head-start: (Diamond, 1997; Olsson-Hibbs, EER, 2005)
    - Persistent effect on population density (1-1500) (Ashraf-Galor, AER 2011)
    - No effect on contemporary income per capita (Ashraf-Galor, AER 2013)
  - Persistent effect on life expectancy (Galor-Moav, 2009; Franck-Galor-Özak, 2019)
- Disease environment
  - Persistent effect on labor productivity & investment in human capital (Gallup-Sachs, 2001; Andersen-Dalgaard-Selmay, REStud 2012; Alsan AER 2015)
- Geographical isolation
  - Reduced trade and technological diffusion (Gallup-Mellinger-Sachs, 1999)
  - Persistence of culture conducive for innovations (Ashraf-Galor-Özak, JEEA 2010; Özak, JOEG 2018)

## Persistent Effects of Geographical Factors

- Land suitable for large plantations

- Inequality:

Land suitable for large plantations → Inequality → Large plantations → Inequality

- Concentration of landownership:

Land suitable for large plantations → Concentration of landownership → Large plantations → Concentration of landownership

- Soil quality conducive for agriculture

Land suitable for large plantations → Soil quality conducive for agriculture → Large plantations → Soil quality conducive for agriculture

## Persistent Effects of Geographical Factors

- Land suitable for large plantations
  - Inequality:
    - Extractive institutions (Engerman-Sokoloff, 1997)
    - Concentration of landownership:
      - Incentives for investment in agriculture
  - Soil quality conducive for agriculture
    - Incentives for investment in agriculture

## Persistent Effects of Geographical Factors

- Land suitable for large plantations
  - Inequality:
    - Extractive institutions (Engerman-Sokoloff, 1997)
    - Concentration of landownership:
      - Inequality → Incentives for investment in agriculture
  - Soil quality conducive for agriculture
    - Incentives for investment in agriculture

## 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

↳ Land abundance → more land per capita → more land available for trade

## 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

## 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

## 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
    - Reduces human capital formation & increases fertility & slows the transition to modern growth (Galor-Mountford, RES 2008)

## 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
    - Reduces human capital formation & increases fertility & slows the transition to modern growth (Galor-Mountford, RES 2008)

## Persistent Effects of Geographical Factors

- Range of soil quality

- Emergence of geographical specific human capital  $\implies$  reduced mobility  $\implies$  ethnic fractionalization (Michalopoulos, AER 2012)

↳ Climate and soil characteristics have been shown to have a significant effect on the range of crops that can be grown.

- Ecological diversity & storable crops

↳ Climate and soil characteristics have been shown to have a significant effect on the range of crops that can be grown.

- Geographical determinants of body size

↳ Climate and soil characteristics have been shown to have a significant effect on the range of crops that can be grown.

## 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
  - Environmental determinants of economic development (Barro, Sala-i-Martin, Weil, 1999)
- Geographical determinants of body size
  - Environmental determinants of economic development (Barro, Sala-i-Martin, Weil, 1999)

## 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
- Geographical determinants of body size

## 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; Mayshar-Moav-Neeman, 2013)
  - Geographical determinants of body size

## 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; Mayshar-Moav-Neeman, 2013)
- Geographical determinants of body size

## 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; Mayshar-Moav-Neeman, 2013)
- Geographical determinants of body size
  - Determined fertility & income per capita in the Malthusian epoch and the timing of the take-off (Dalggaard-Strulik, 2013)

## 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; Mayshar-Moav-Neeman, 2013)
- Geographical determinants of body size
  - Determined fertility & income per capita in the Malthusian epoch and the timing of the take-off (Dalgaard-Strulik, 2013)

## 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:
  - Distance to nearest neighbor (Galor-Subrahmanyam, 2012)
  - Distance to nearest ocean (Galor-Subrahmanyam, 2012)
- Cultural diversity within a society:
  - Fraction of ethnic minorities (Galor-Subrahmanyam, 2012)

Source: Galor and Subrahmanyam (2012). The figure shows the correlation between the fraction of ethnic minorities in a country and its economic development. The correlation is negative, indicating that countries with higher ethnic diversity tend to have lower per capita income.

## 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:
  - Distance to nearest neighbor (Galor-Subrahmanyam, 2012)
  - Distance to nearest ocean (Galor-Subrahmanyam, 2012)
- Cultural diversity within a society:
  - Fraction of ethnic minorities (Galor-Subrahmanyam, 2012)

Source: Galor and Subrahmanyam (2012). The figure shows the correlation between the fraction of ethnic minorities in a country and its economic development. The correlation is negative, indicating that countries with higher ethnic diversity tend to have lower per capita income.

Source: Galor and Subrahmanyam (2012). The figure shows the correlation between the distance to the nearest ocean and a country's economic development.

Source: Galor and Subrahmanyam (2012). The figure shows the correlation between the distance to the nearest neighbor and a country's economic development.

Source: Galor and Subrahmanyam (2012). The figure shows the correlation between the preference for education and a country's economic development.

Source: Galor and Subrahmanyam (2012). The figure shows the correlation between the entrepreneurial spirit and a country's economic development.

Source: Galor and Subrahmanyam (2012). The figure shows the correlation between time preference and a country's economic development.

## 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:
  - Distance to nearest neighbor (Galor-Subrahmanyam, 2012)
  - Distance to nearest ocean (Galor-Subrahmanyam, 2012)
- Cultural diversity within a society:
  - Fraction of immigrants (Galor-Subrahmanyam, 2012)

Source: Galor and Subrahmanyam (2012). The figure shows the correlation between the fraction of immigrants in a country and its economic development. The correlation is negative, indicating that countries with higher fractions of immigrants tend to have lower economic development.

## 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:
  - Distance to nearest neighbor
  - Number of ethnic groups
  - Fraction of immigrants
- Cultural diversity within a society:
  - Fraction of immigrants

## 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:
  - Incentives for innovation (Spolaore-Wacziarg, 2014)

Source: Spolaore and Wacziarg (2014). The figure shows the relationship between the level of economic development and the degree of cultural distance between countries.

Source: Spolaore and Wacziarg (2016). The figure shows the relationship between the level of economic development and the degree of cultural diversity within countries.

# 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:

## 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:

• Cultural diversity

• Language diversity

• Ethnic diversity

• Religious diversity

• Political diversity

• Social diversity

• Economic diversity

• Technological diversity

• Geographical diversity

• Institutional diversity

## 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
    - Reduces social capital
    - Reduces social trust
  - Generates a wider range of complementary traits conducive for specialization & innovations (Ashraf-Galor, AER 2013; Depetris-Özak, 2015, 2016)
    - Specialization
    - Innovation
  - 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)
    - 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)
    - 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)
    - 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)
    - 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)
    - 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)  
Lower income in overly homogenous & diverse societies

# Growth and Comparative Development

## The Big Picture & Overview

Ömer Özak

Department of Economics  
Southern Methodist University

Economic Growth and Comparative Development