

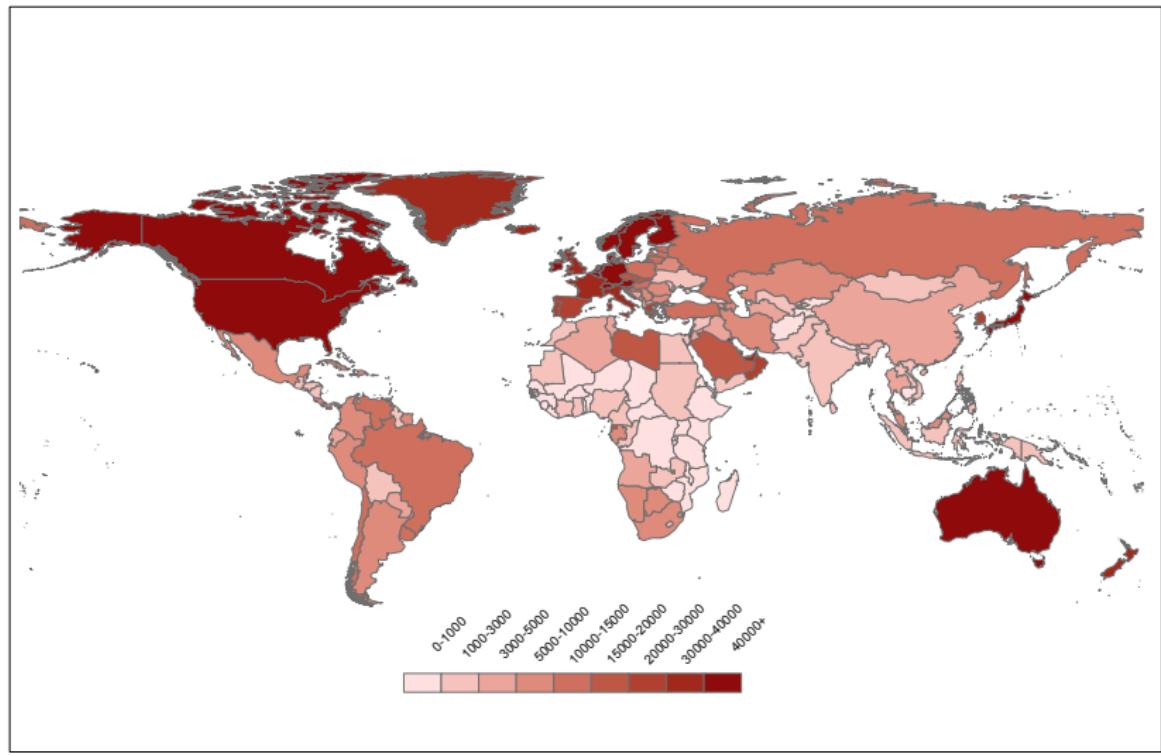
Growth and Comparative Development: An Overview

Ömer Özak

Department of Economics
Southern Methodist University

Economic Growth and Comparative Development

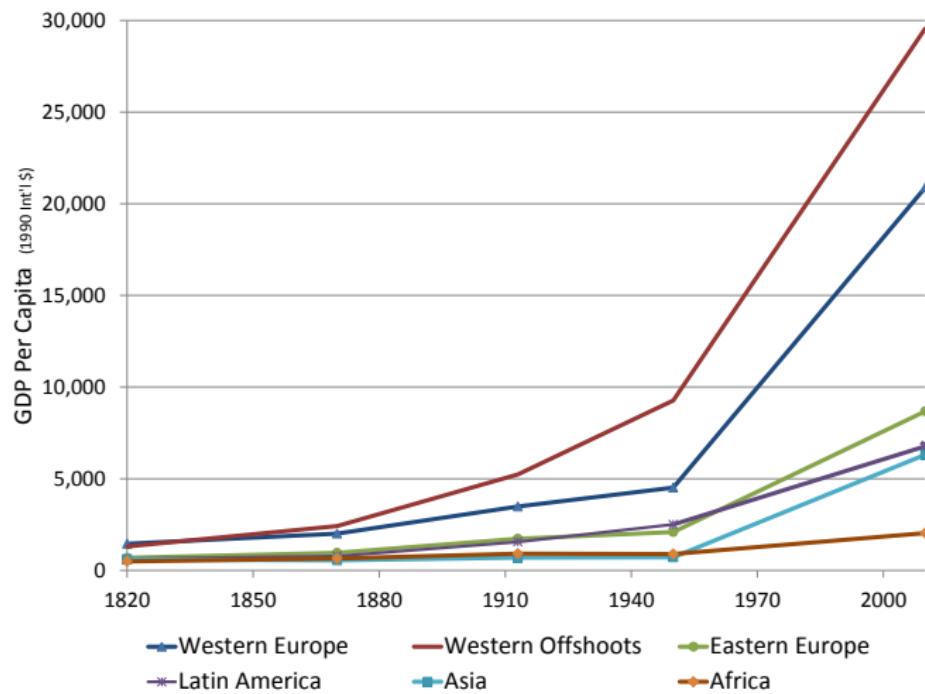
Income per Capita across the Globe in 2010



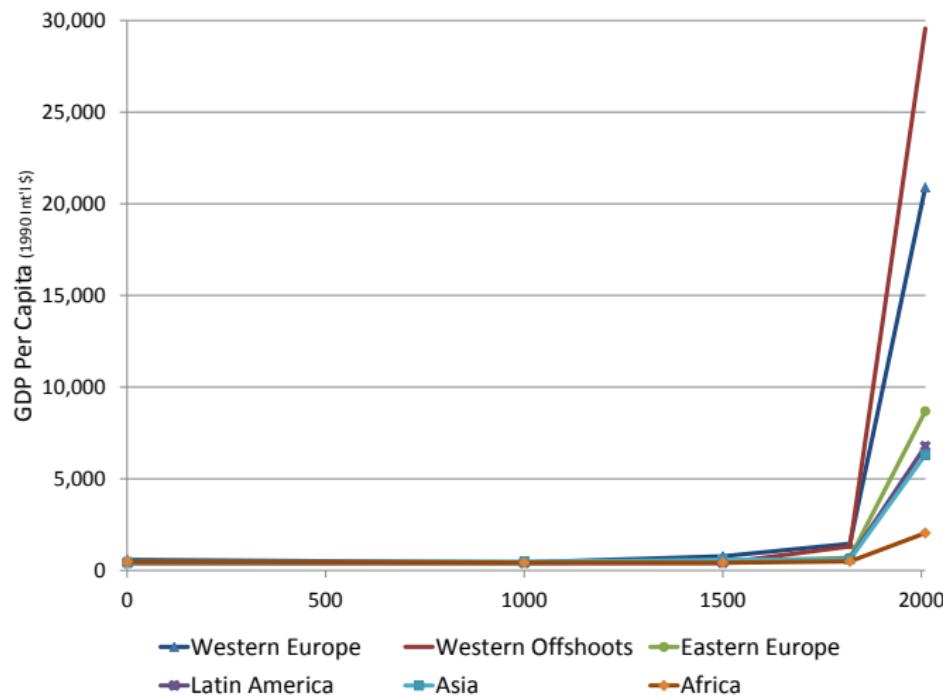
Night Lights across the Globe in 2016



Divergence across Regions: 1820–2010



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.

Inferences from Growth Theory

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

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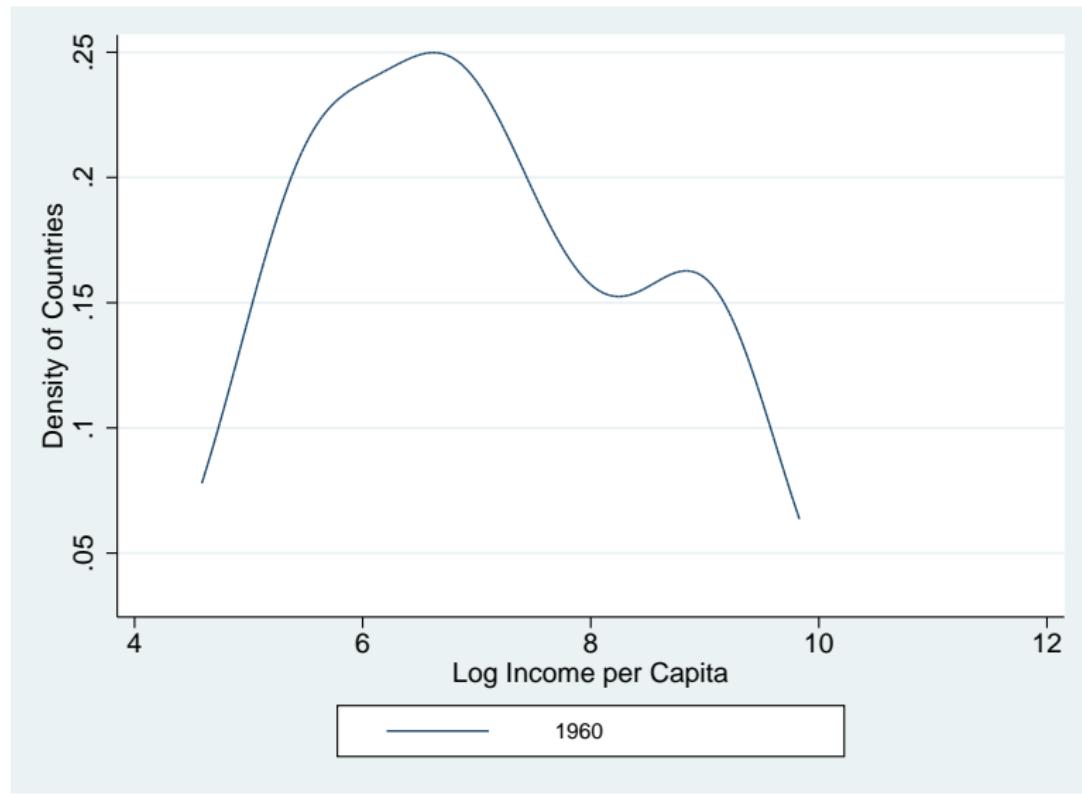
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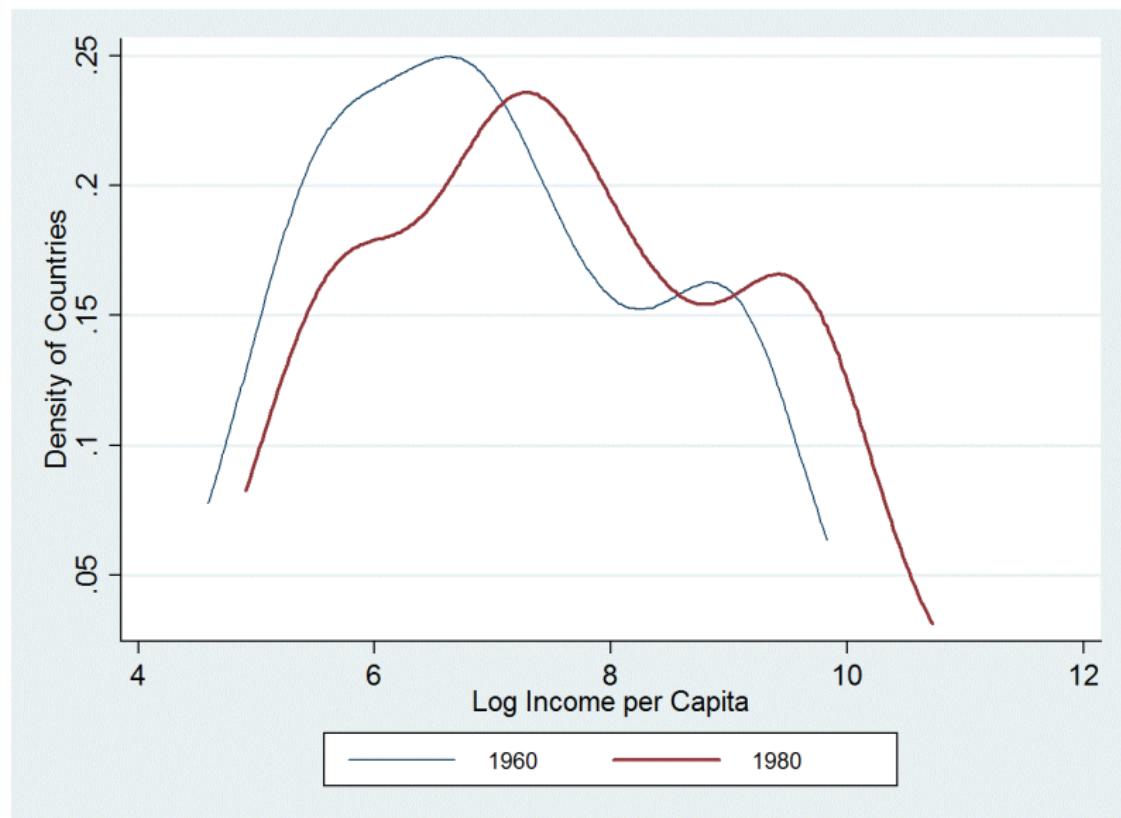
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Income Distribution in 1960



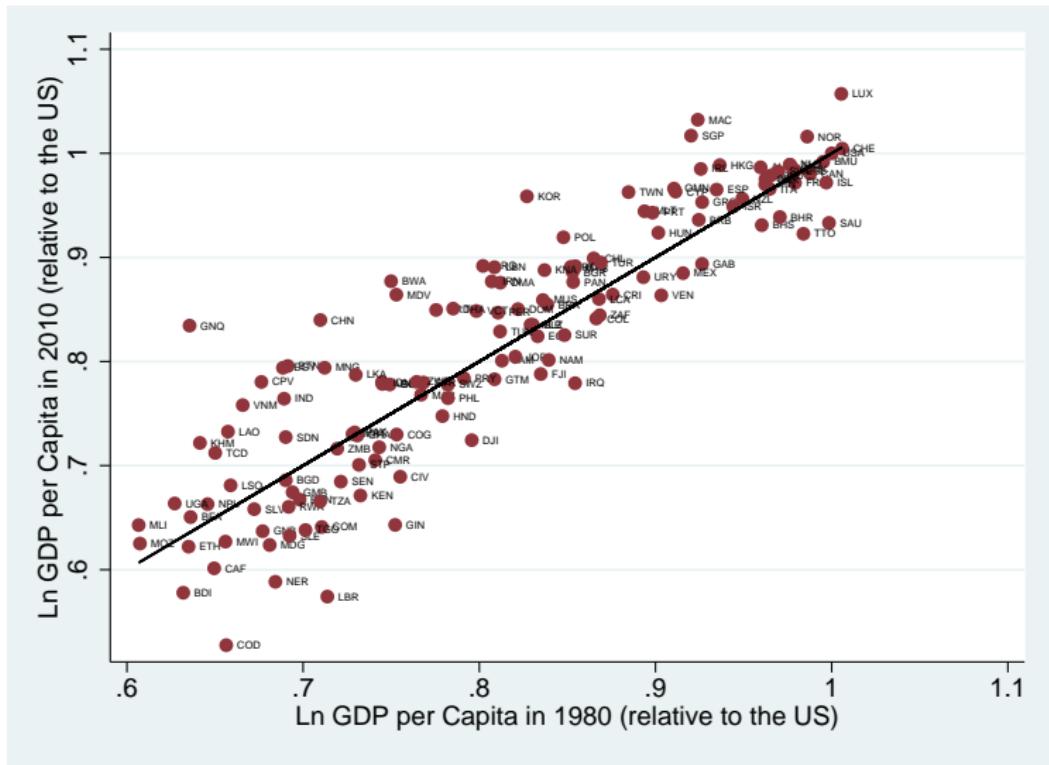
Lack of Convergence across Nations: 1960–1980



Lack of Convergence across Nations: 1960–2000



Persistent Inequality across Nations: 1980–2010



Fundamental Research Questions

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

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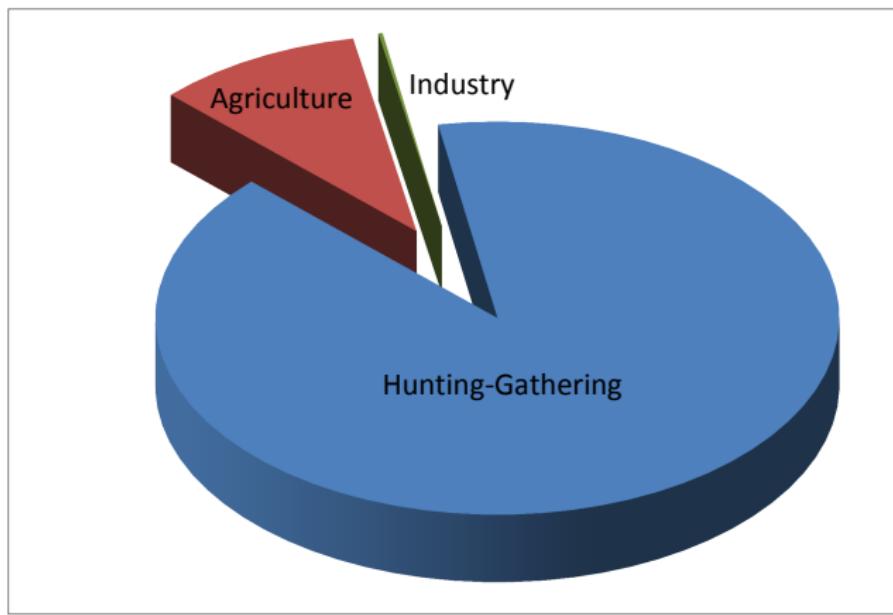
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Phases of Development: Modes of Production



Phases of Development: Standard of Living

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

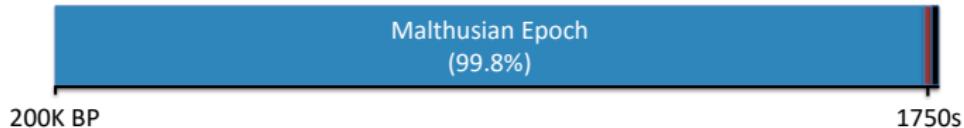
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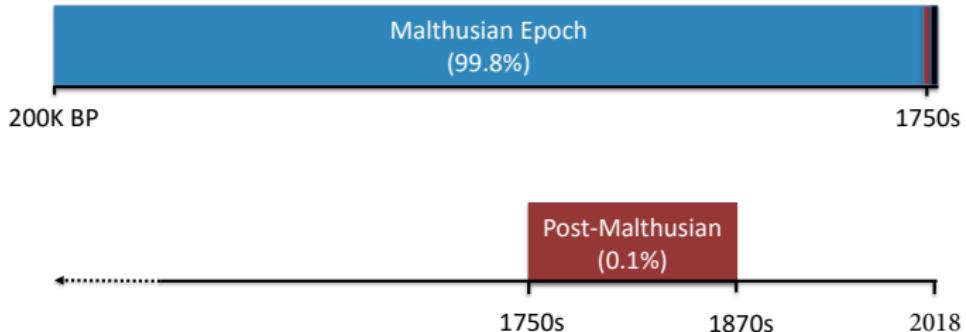
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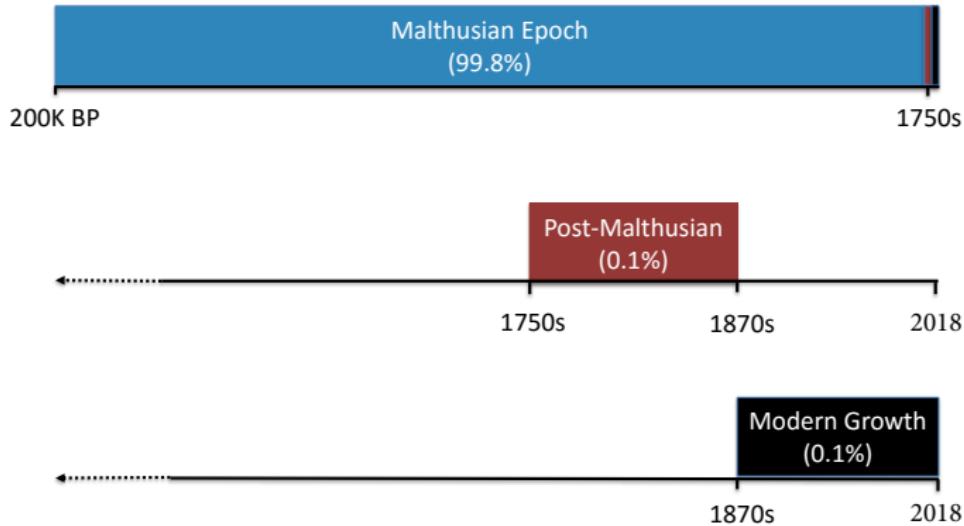
Phases of Development: Timeline of the Most Developed Economies



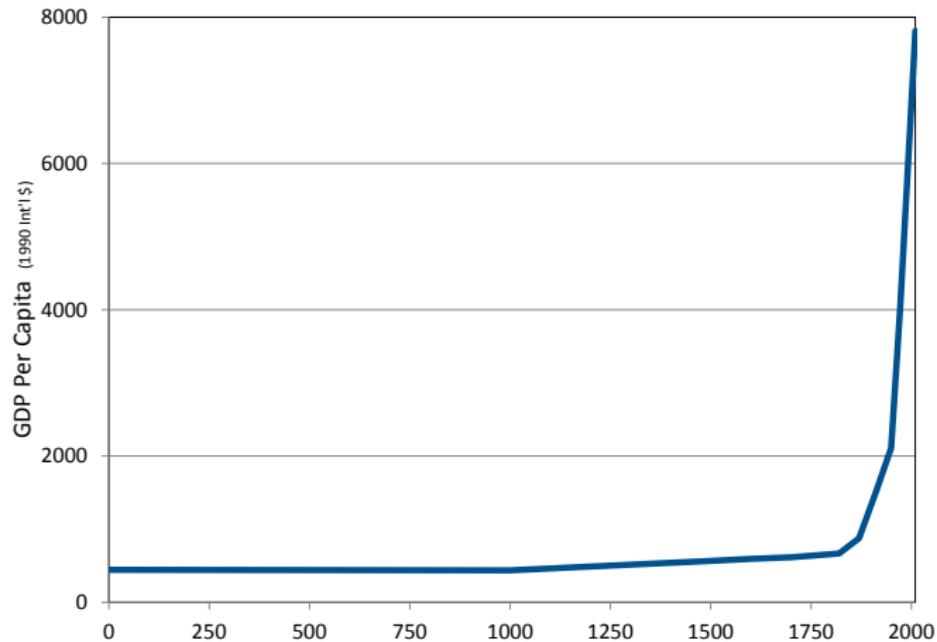
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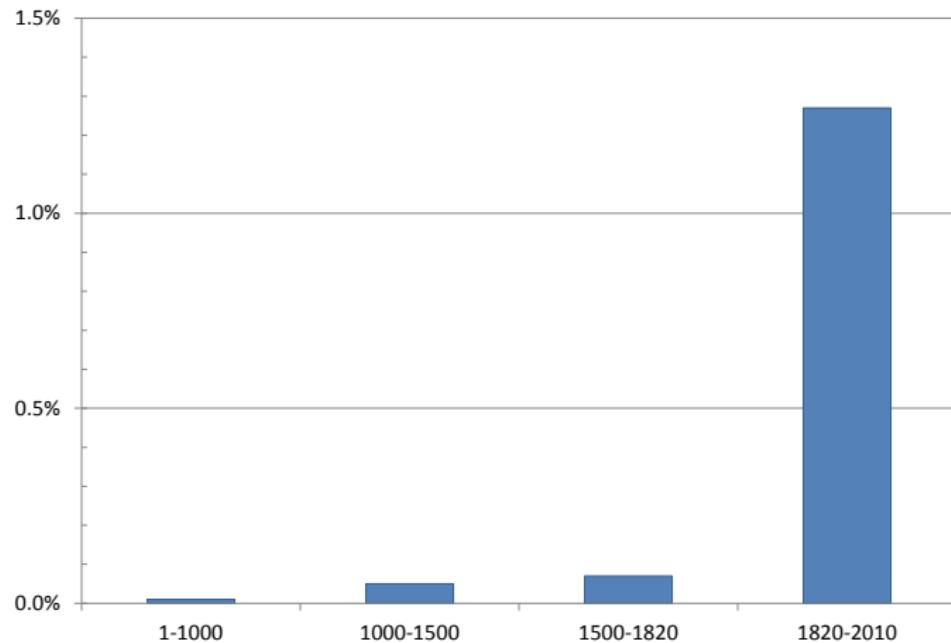
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World Income per Capita: 1–2010



Growth of World Income per Capita: 1–2010



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

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Malthusian Dynamics - Prominent Examples

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

- The Columbian Exchange \implies 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 \implies Great Famine
 - Population decreases by about 2 million
 - (1M Famine death & 1M emigration to the New World)

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- 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

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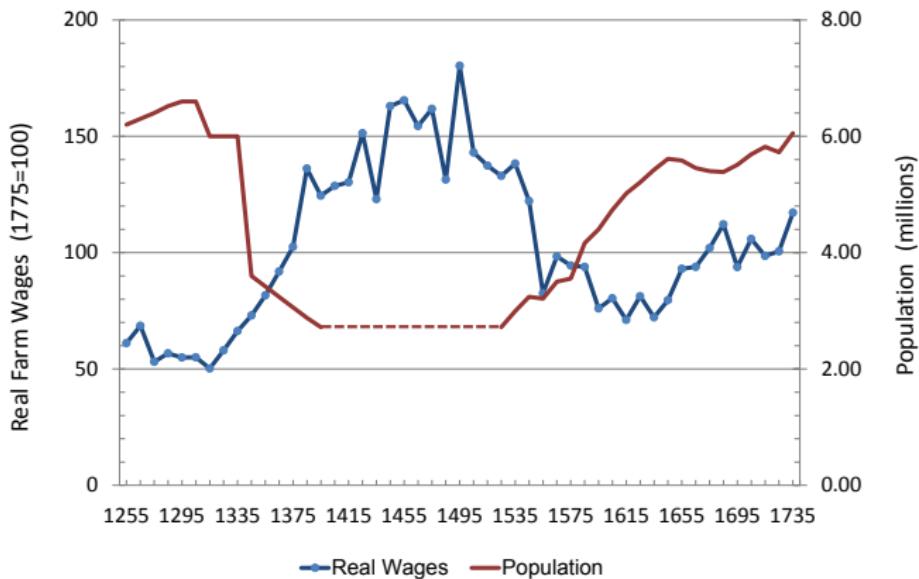
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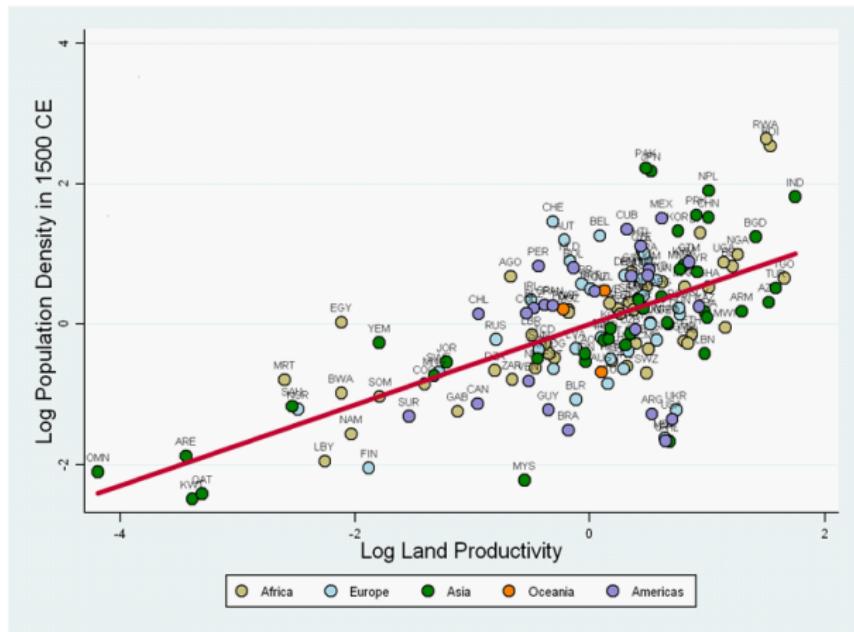
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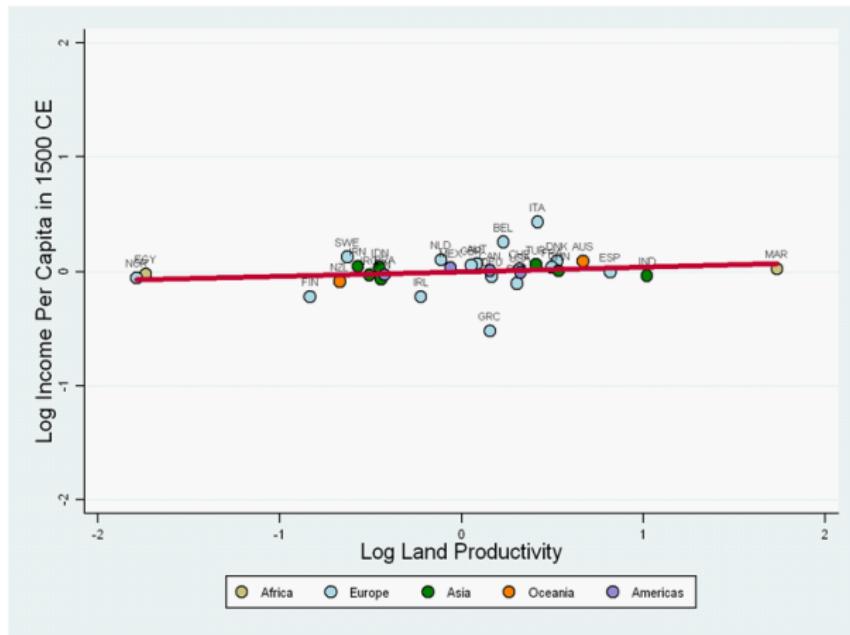
Malthusian Adjustments to the Black Death: England, 1348–1750



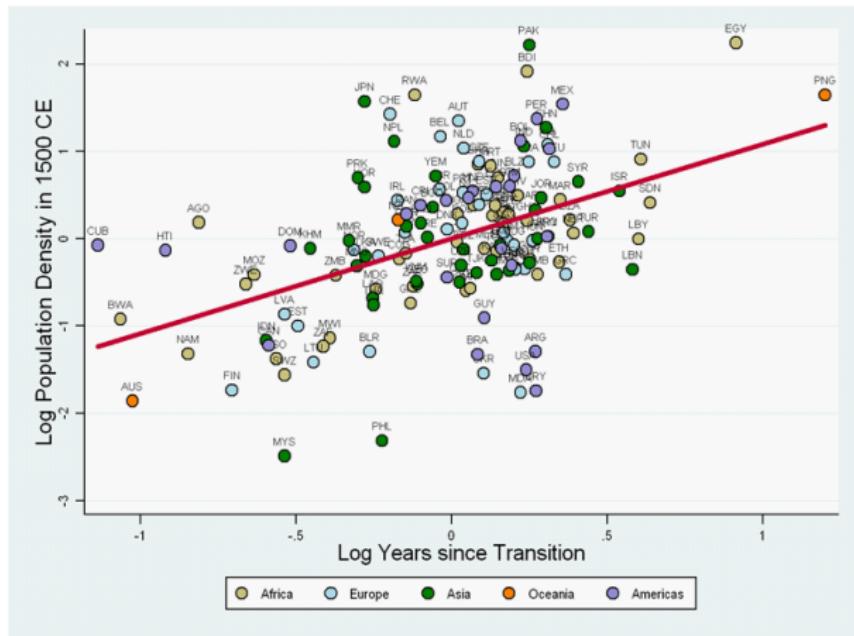
Land Productivity and Population Density in 1500



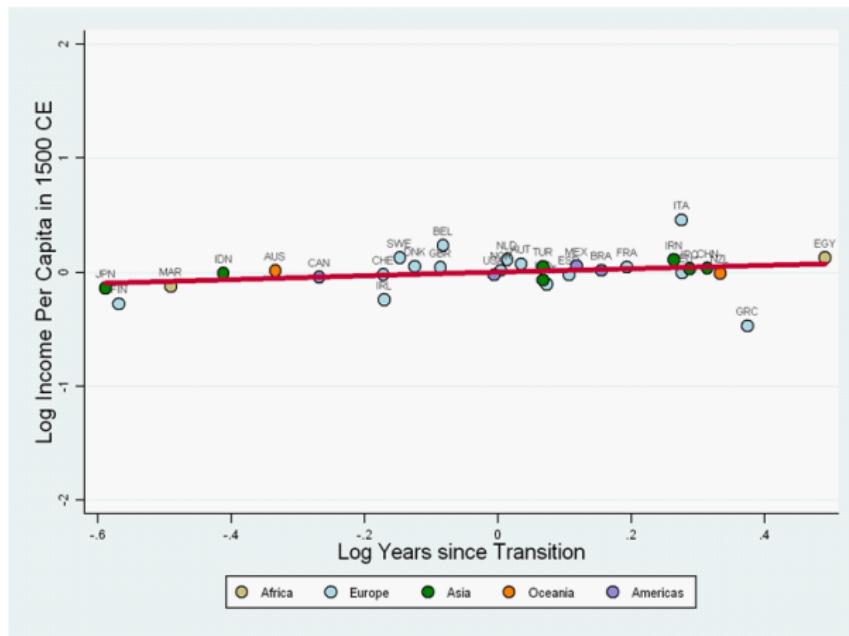
Land Productivity and Income per Capita in 1500



Technology and Population Density in 1500



Technology and Income per Capita in 1500



The Post-Malthusian Regime

- 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
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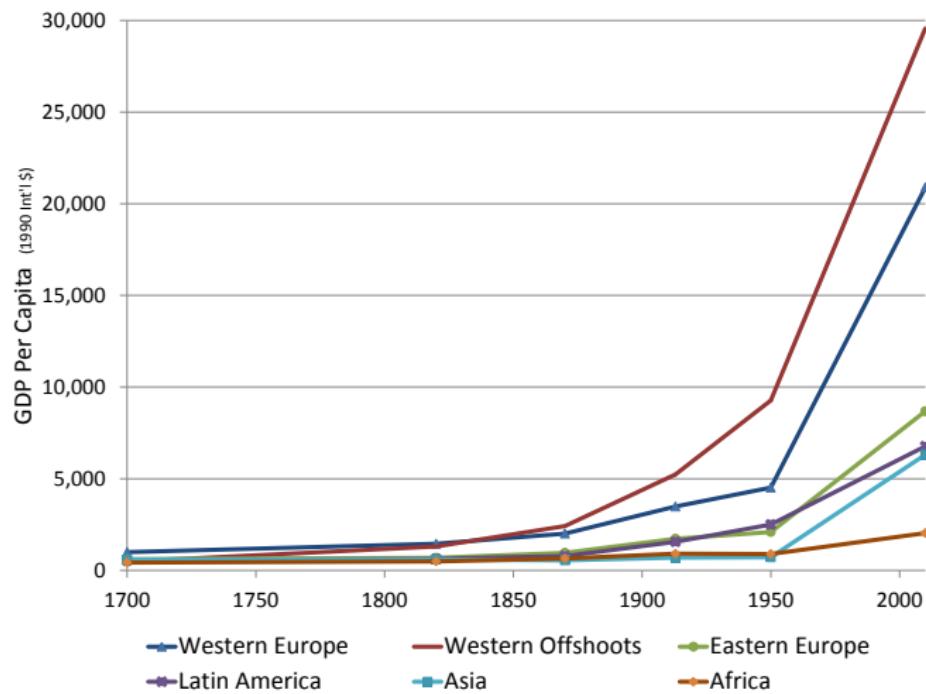
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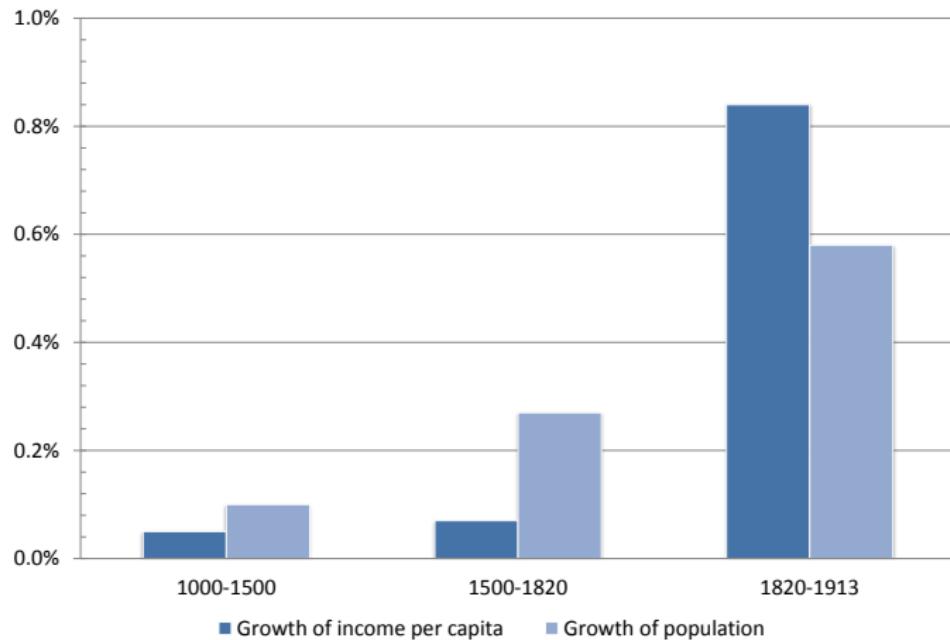
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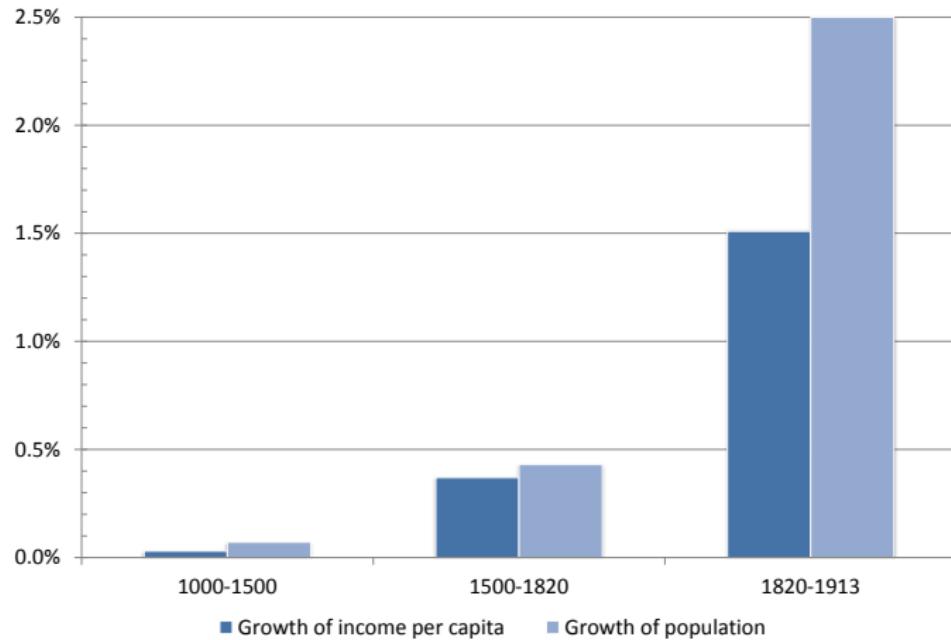
Regional Variation in the Timing of the Take-off



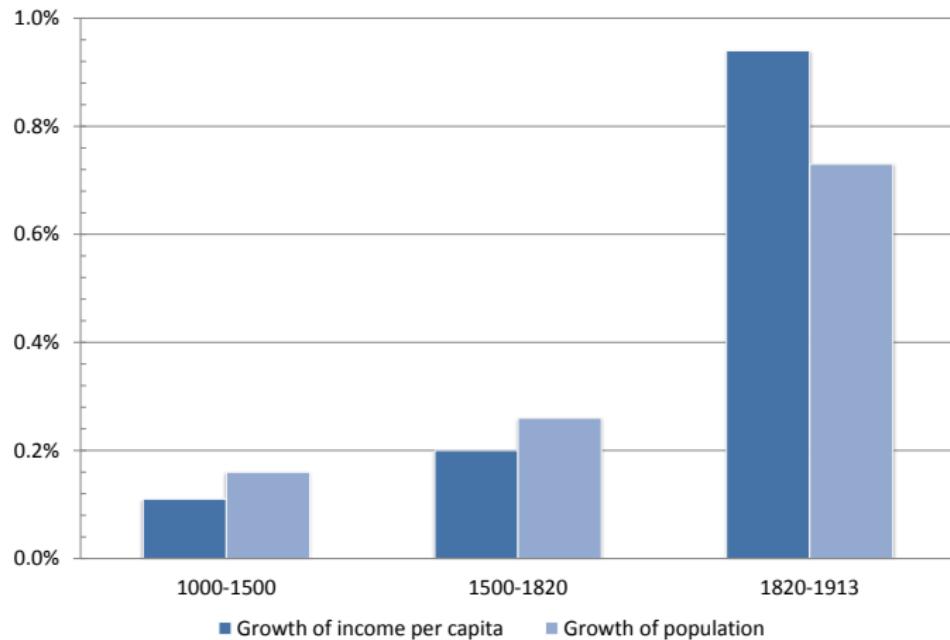
Take-off: Growth of Population & Income per Capita – World



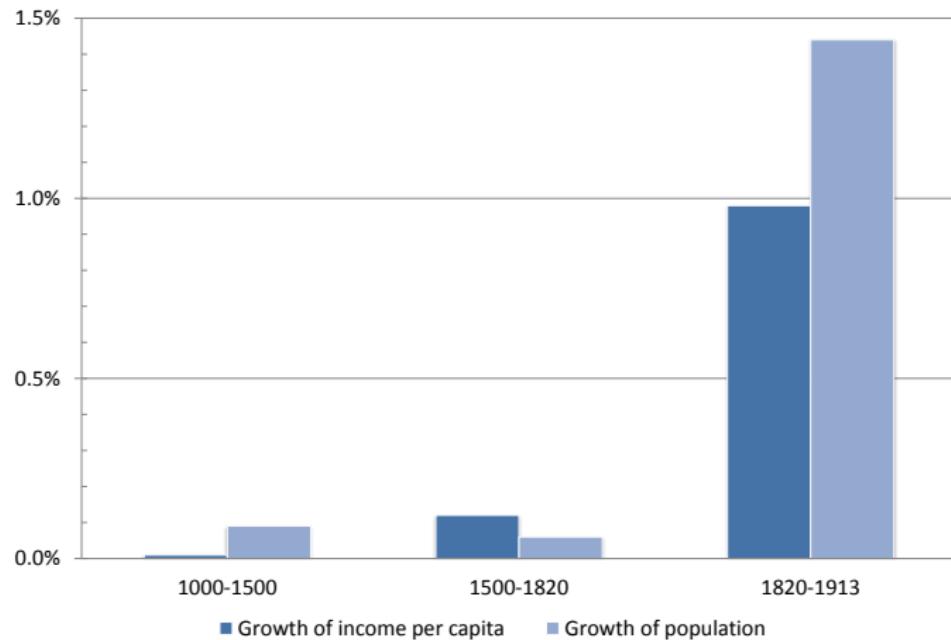
Take-off: Growth of Population & Income per Capita – Western Offshoots



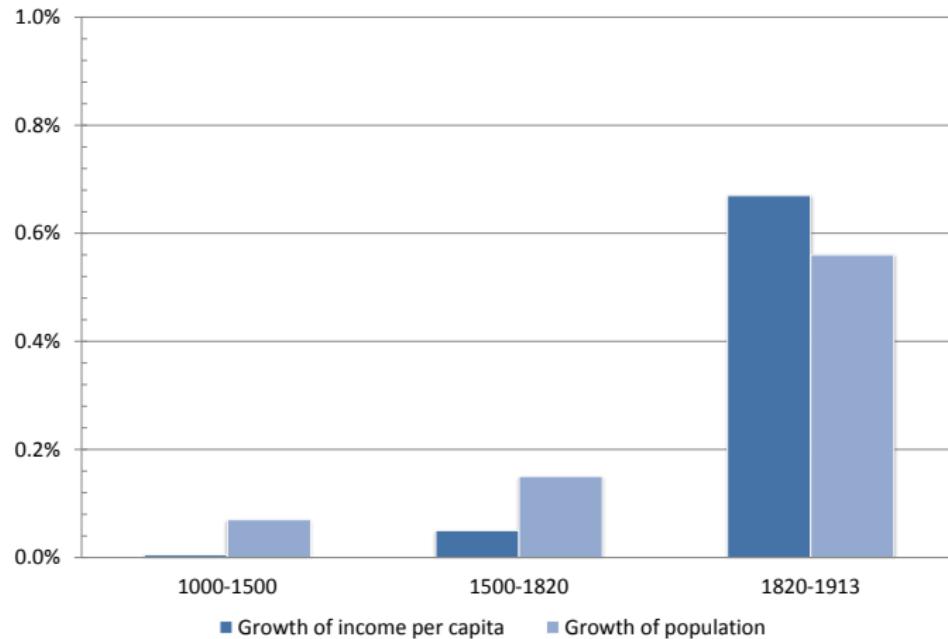
Take-off: Growth of Population & Income per Capita – Western Europe



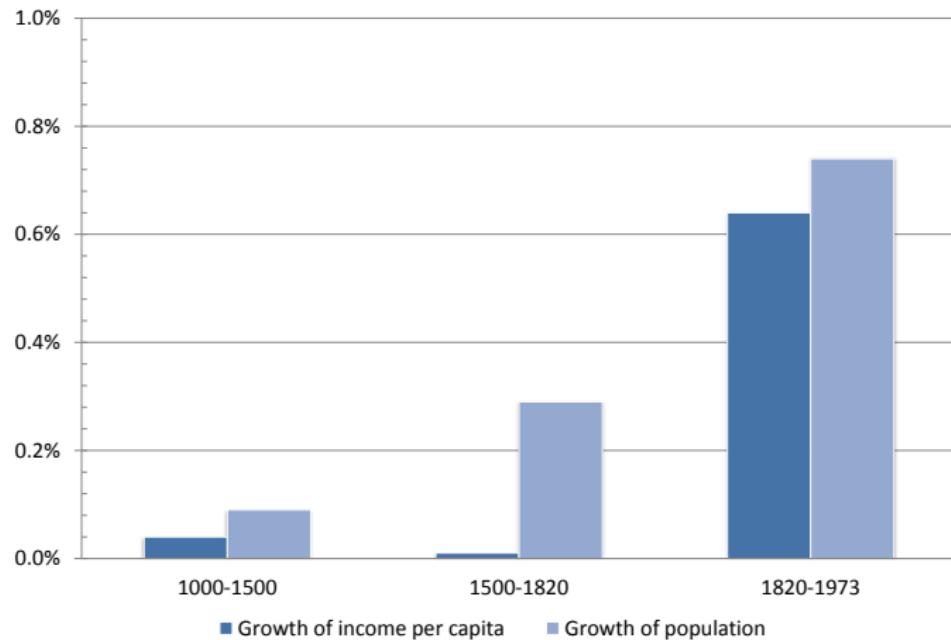
Take-off: Growth of Population & Income per Capita – Latin America



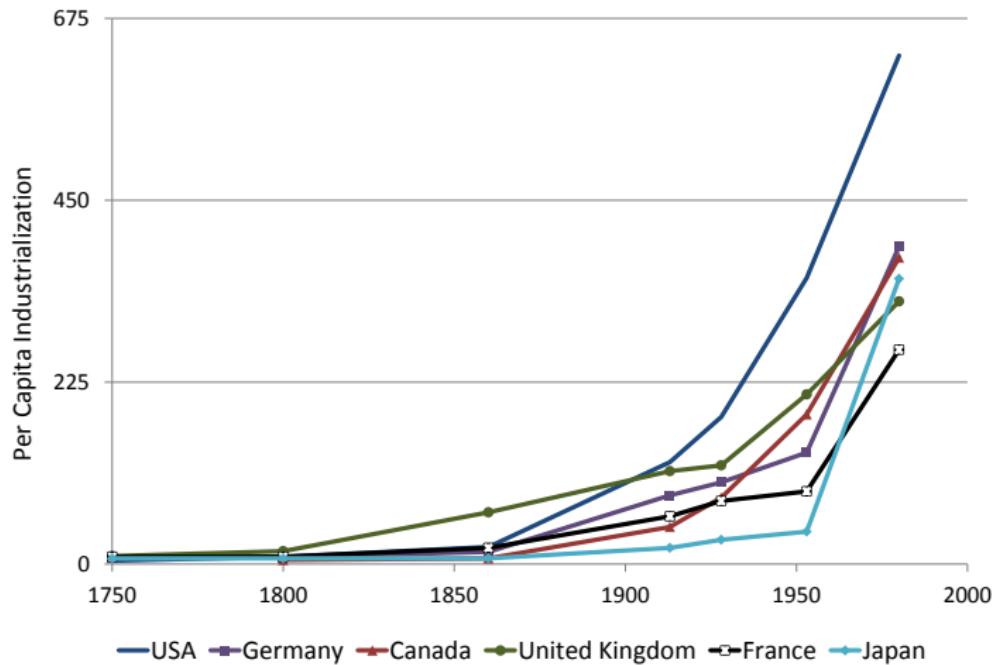
Take-off: Growth of Population & Income per Capita – Africa



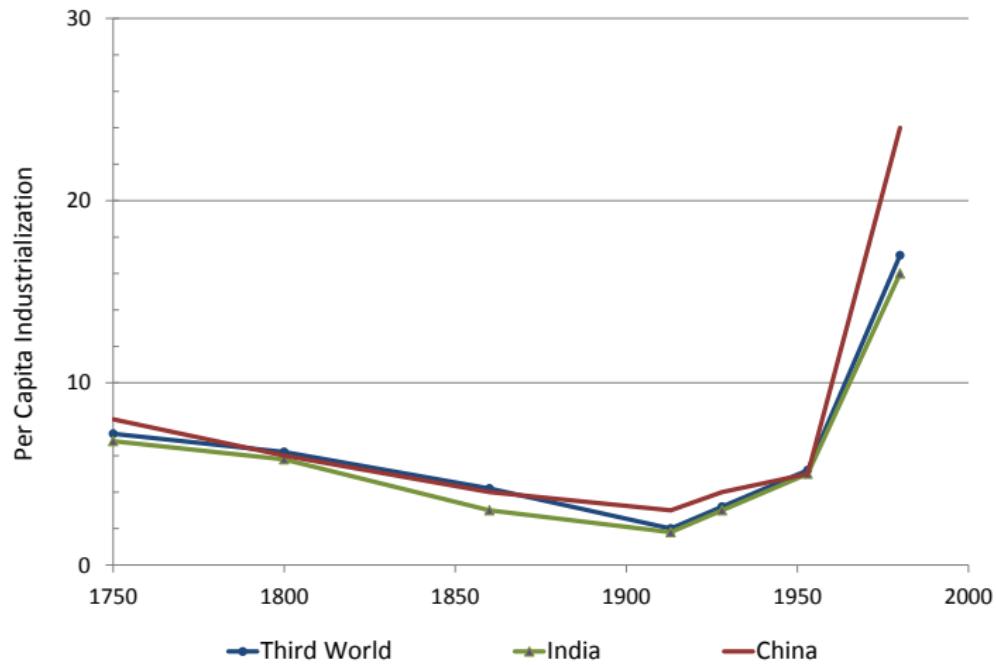
Take-off: Growth of Population & Income per Capita – Asia



Take-off & Increased Industrialization per Capita



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



The Modern Growth Regime

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

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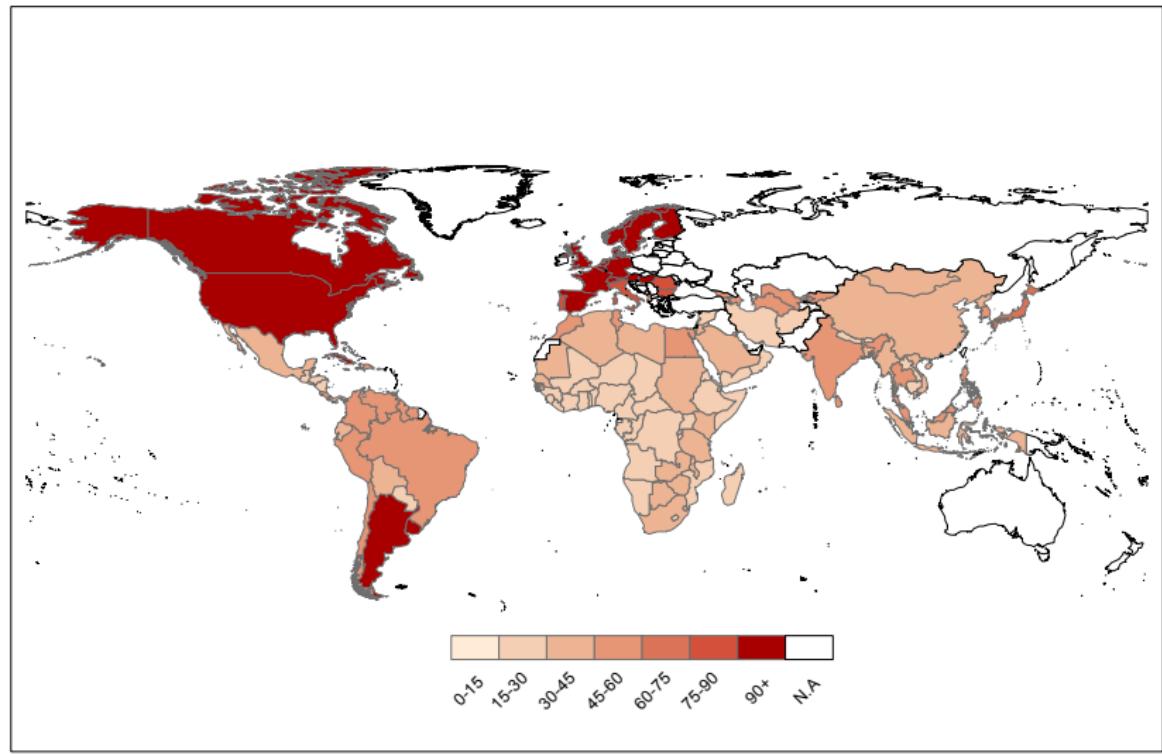
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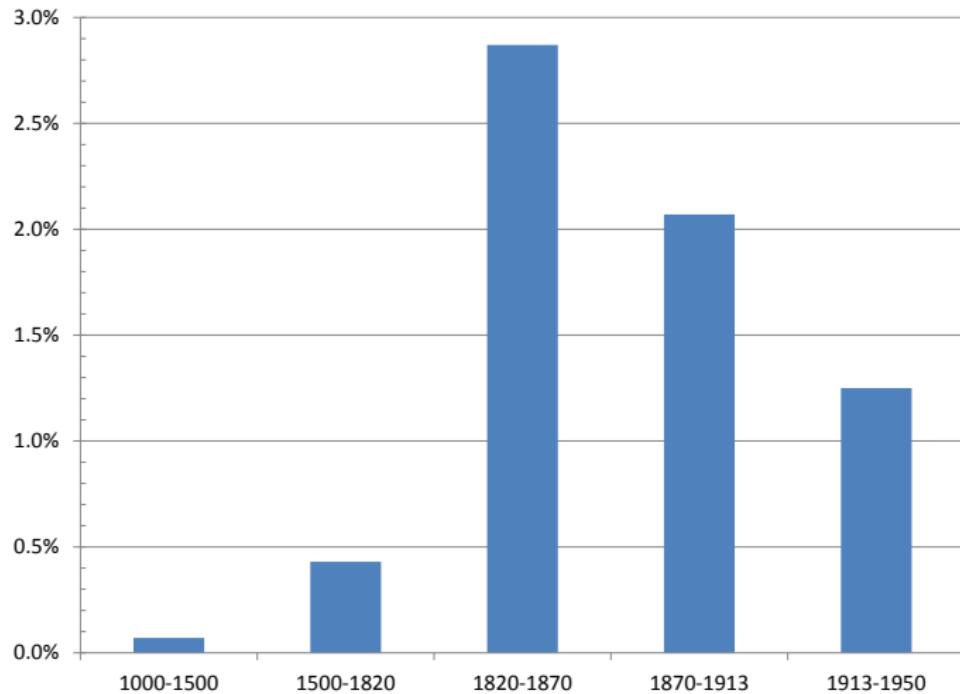
The Modern Growth Regime

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

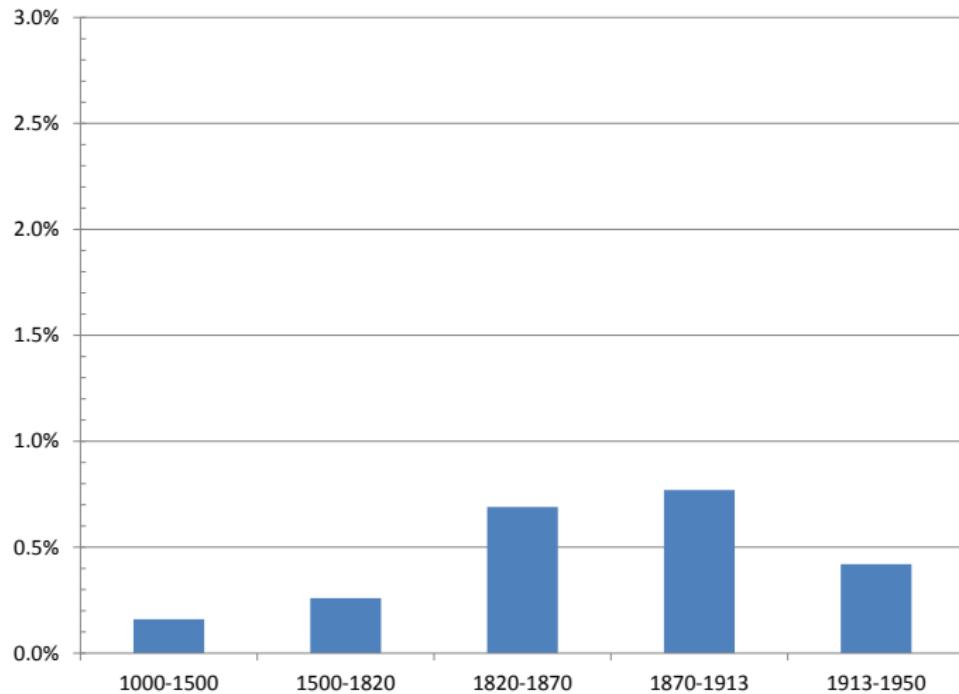
Variation in Years Elapsed since the Onset of the Fertility Decline



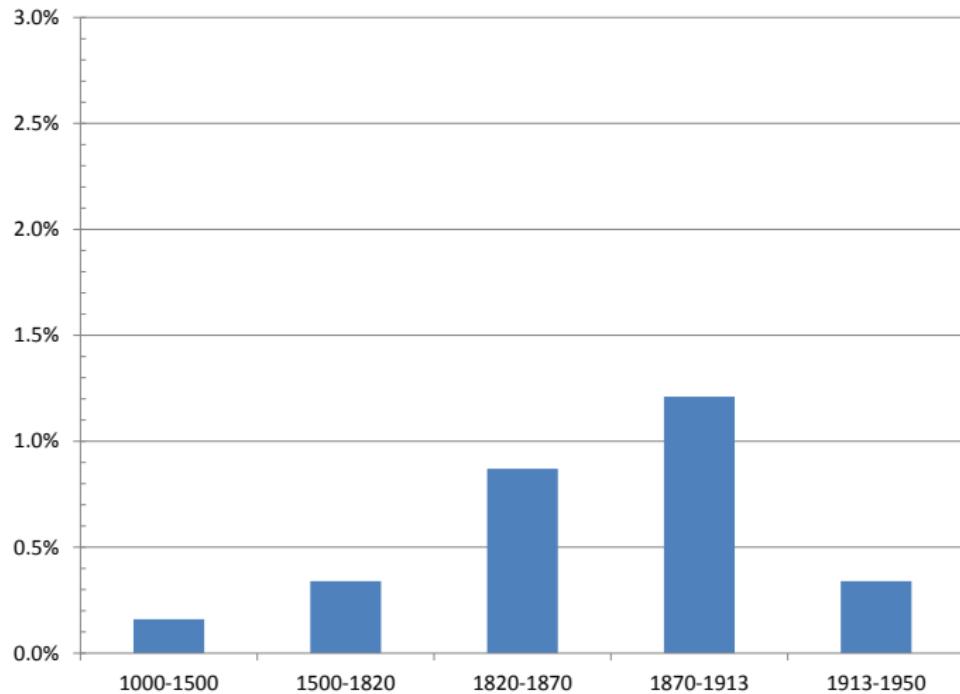
Early Fertility Decline – Western Offshoots



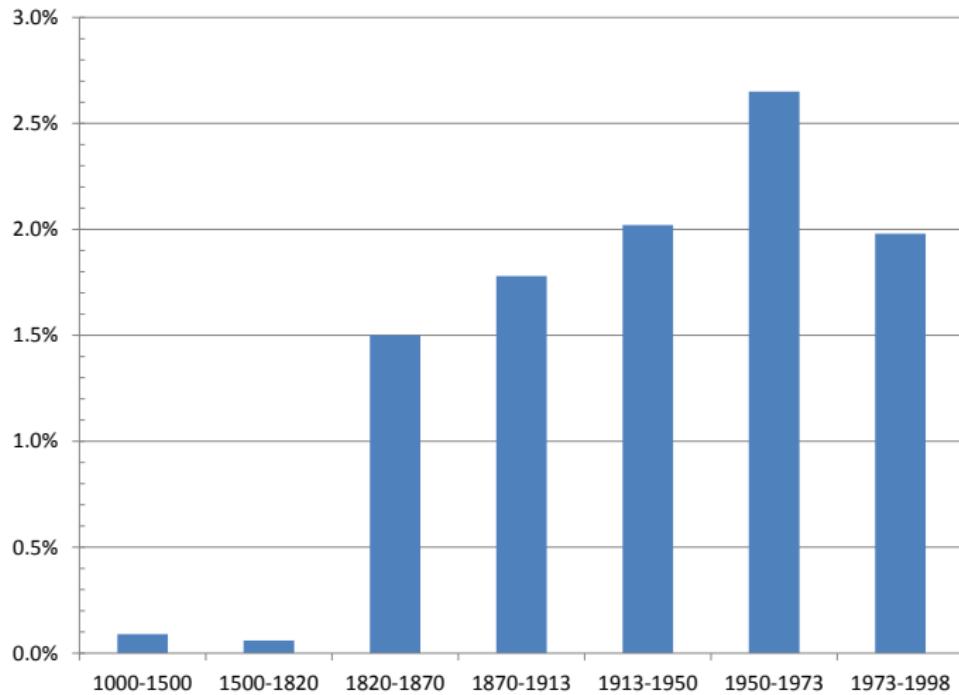
Early Fertility Decline – Western Europe



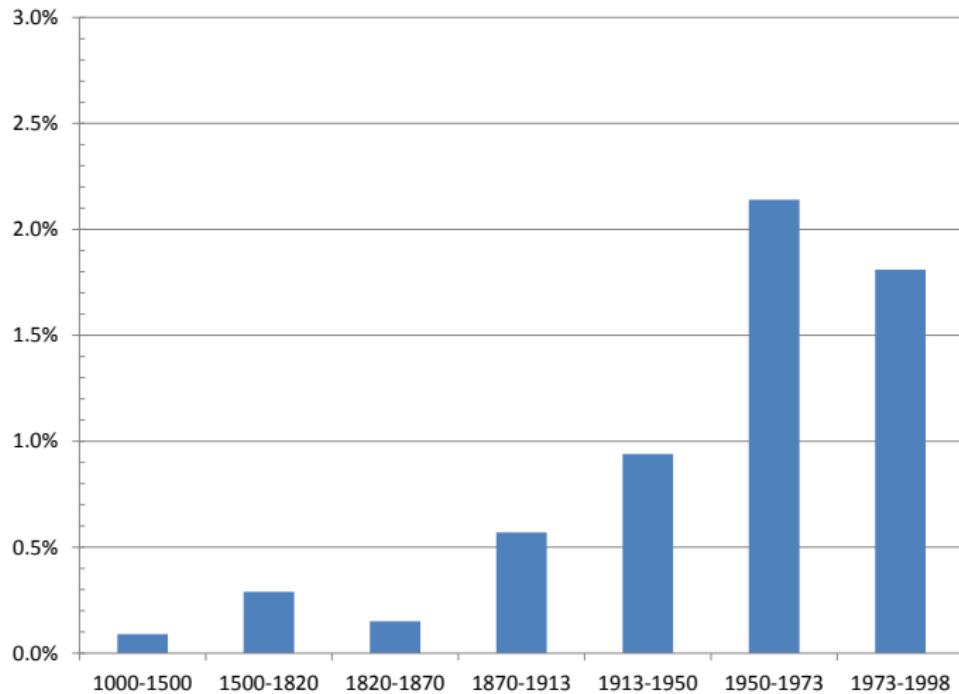
Early Fertility Decline – Eastern Europe



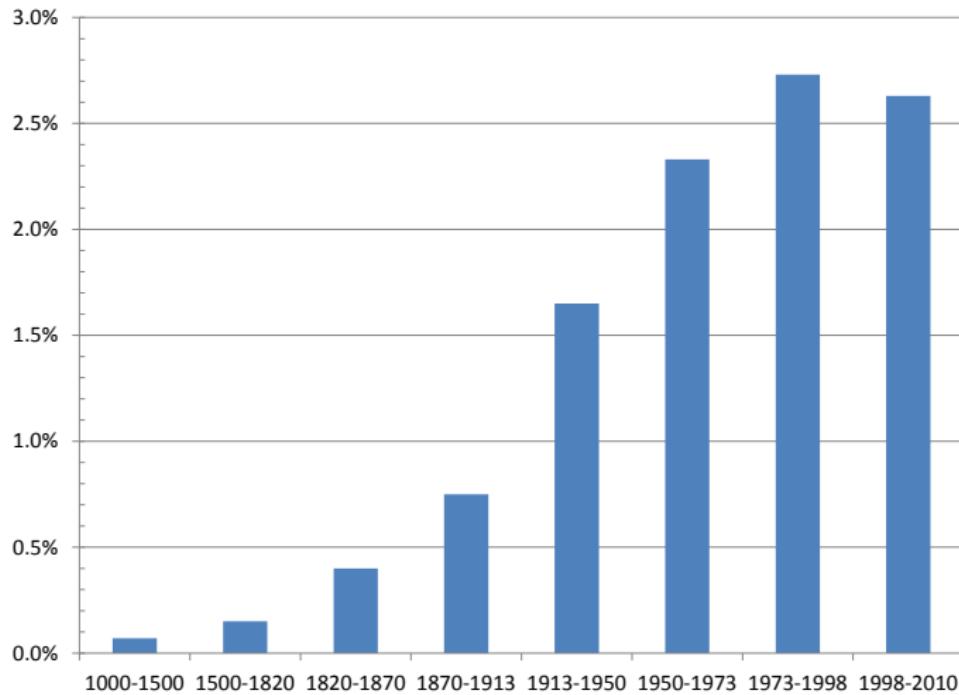
Late Fertility Decline – Latin America



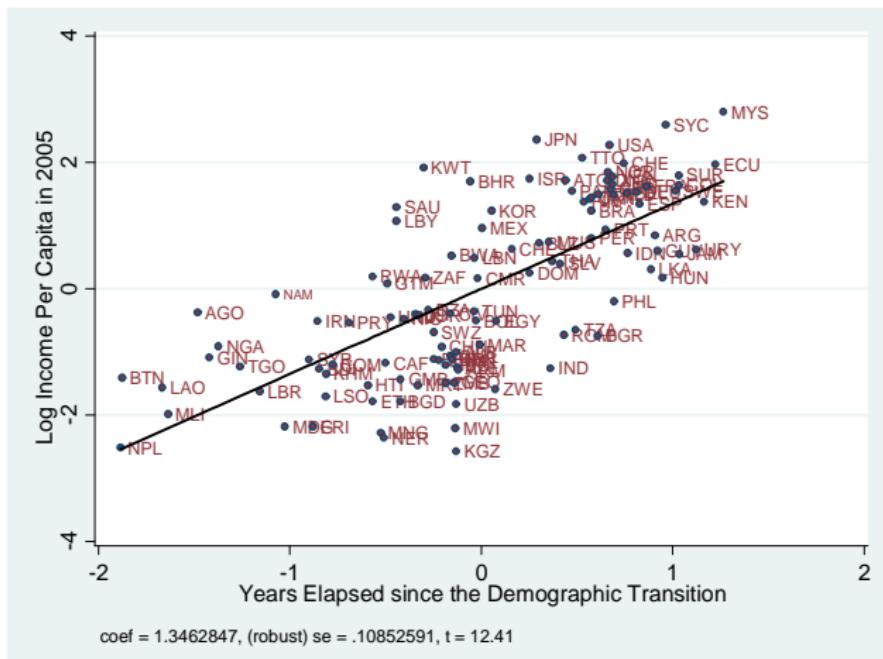
Late Fertility Decline – Asia



Late Fertility Decline – Africa

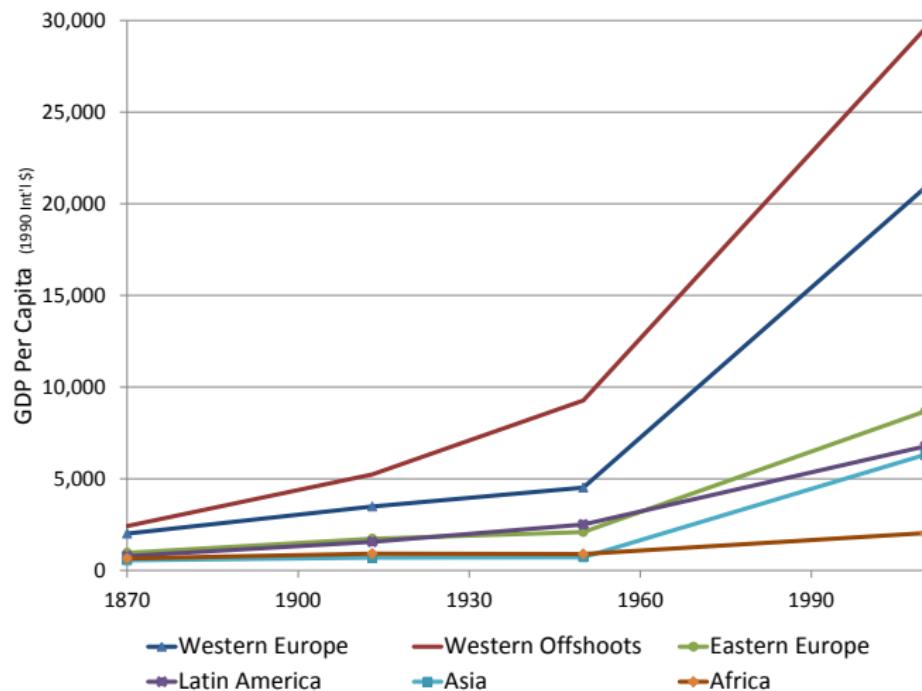


Timing of the Demographic Transition and Current Income per Capita

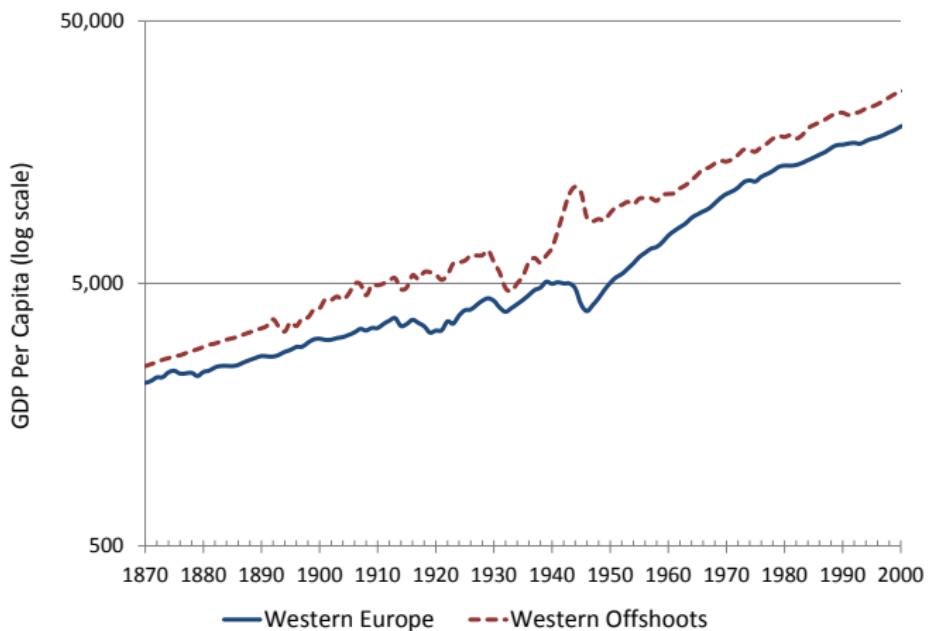


Conditional on absolute latitude.

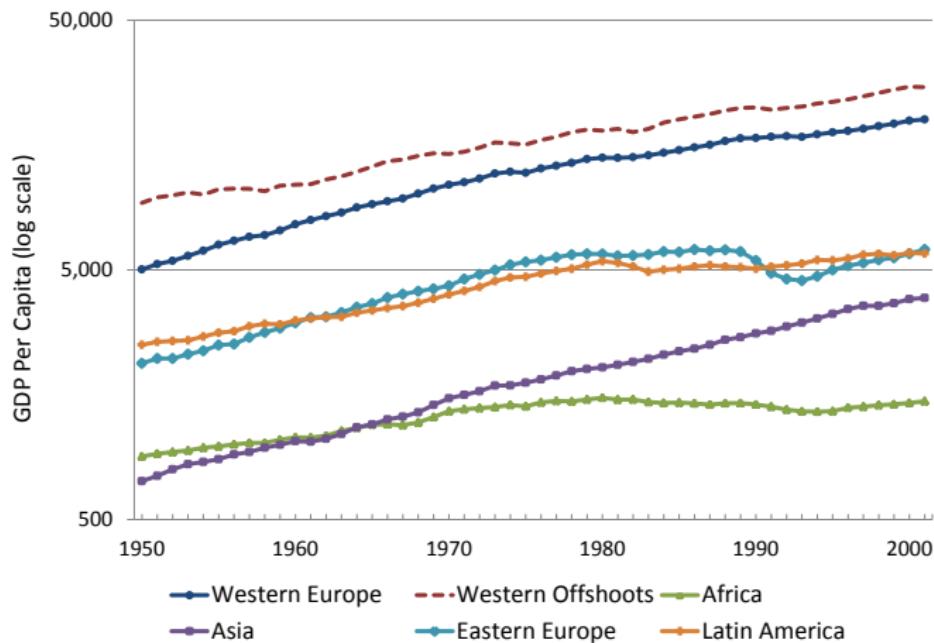
Timing of the Demographic Transition and Divergence across Regions



Sustained Economic Growth: 1870–2000



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



Fundamental Research Questions: The Malthusian Epoch

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

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- 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)

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- 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
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 - Malthusian Epoch - tech progress had no effect on LR income
 - GT: does not capture the demographic transition (DT)
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- Policy based on insights from growth theory encourage
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 - Openness to international capital markets
 - Technological diffusion
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 - Persistent effect on labor productivity & investment in human capital (Gallup-Sachs, 2001; Andersen-Dalgaard-Selaya, REStud 2012; Alsan AER 2015)
- Geographical isolation
 - Reduced trade and technological diffusion (Gallup-Meissner-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)
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 - No effect on contemporary income per capita (Ashraf-Galor, AER 2013)
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Persistent Effects of Geographical Factors

- Land suitable for large plantations
 - Inequality:
 - Extractive institutions (Engerman-Sokoloff, 1997)
 - Concentration of landownership:
 - Suboptimal investment in public education (Galar-Moav-Voth, RES 2009)
- Soil quality conducive for agriculture
 - Specialization in unskilled-intensive goods
 - Fertile soil can support more people per unit area, leading to higher population density and more specialization in agriculture.

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Geographic factors are often considered to be exogenous to economic development. However, they can also be endogenous through their effects on institutions and factor prices.

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 - Inequality:
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Geographical factors can have both positive and negative effects on economic development.
Geographical factors can be persistent over long periods of time.

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Geographical factors can have persistent effects on economic development through their influence on institutions, land ownership patterns, and agricultural specialization.

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Persistent Effects of Geographical Factors

- Range of soil quality
 - Emergence of geographical specific human capital \implies reduced mobility \implies ethnic fractionalization (Michalopoulos, AER 2012)
 - Persistent effect of ethnic fractionalization (Easterly-Levine, QJE 1997)
- Ecological diversity & storable crops
 - Emergence & persistence of state capacity (Fenske, JEEA 2014; Mayshar-Moav-Neeman, 2013)
- Geographical determinants of body size
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Persistent Effects of Intergenerationally Transmitted Traits

- Natural selection of traits that are complementary to the growth process:
 - Preference for education (Galor-Moav, QJE 2002; Galor-Klemp, 2018)
 - Entrepreneurial spirit (Galor-Michalopoulos, JET 2012)
 - Time Preference (Galor-Özak, AER 2016)
- Cultural distance between societies reduces:
 - Diffusion from the technological frontier (Spolaore-Wacziarg, QJE 2009)
 - Conflict (Spolaore-Wacziarg, REStat 2016; Depetris-Özak, 2019)
- Cultural diversity within a society:
 - Reduces cohesiveness:
 - Reduces social capital (Acemoglu-Dixit, 2012)
 - Reduces social trust (Acemoglu-Dixit, 2012)
 - Generates a wider range of complementary traits conducive for specialization & innovations (Ashraf-Galor, AER 2013; Depetris-Özak, 2015, 2016)
 - Specialization & innovation leads to higher productivity (Acemoglu-Dixit, 2012)
 - Specialization & innovation leads to higher income (Acemoglu-Dixit, 2012)
 - Has a hump-shaped effect on productivity (Ashraf-Galor, AER 2013)
 - Lower income in overly homogenous & diverse societies

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 - Reduces cohesiveness:
 - Reduces social capital & trust
 - Reduces social norms & values
 - Reduces social stability & order
 - Generates a wider range of complementary traits conducive for specialization & innovations (Ashraf-Galor, AER 2013; Depetris-Özak, 2015, 2016)
 - Specialization & innovation
 - Technological progress
 - Economic growth
 - Has a hump-shaped effect on productivity (Ashraf-Galor, AER 2013)
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 - Reduces cohesiveness:
 - Reduces social capital & trust
 - Reduces social norms & social control
 - Reduces social costs of conflict
 - Generates a wider range of complementary traits conducive for specialization & innovations (Ashraf-Galor, AER 2013; Depetris-Özak, 2015, 2016)
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 - Increased mistrust & prevalence of civil conflict (Arbati-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)
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