Lecture 1
The Malthusian Era

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Economic History
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- This is **not** why we are here
    - though all means to get motivated are allowed
    - we are here to prepare you to face the *future*

"[Ancient Greeks] saw the future as something that came upon them from behind their backs with the past receding away before their eyes. When you think about it, that's a more accurate metaphor than our present one. Who really can face the future? All you can do is project from the past, even when the past shows that such projections are often wrong" (Robert M. Pirsig: Zen and the Art of Motorcycle Maintenance, 1974, afterword)

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- We are here to make you better *economists*
    - most of the material published in top economics journals
    - this focus has both limitatations and strengths; you should **not**
      think this as a substitute for "traditional" economic history courses

An anecdote illustrating how much better off we are than people just 150 years ago: Prince Albert, the husband of Queen Victoria, died at the age of 42 in 1861. The likely cause of death was typhoid. It is a bacterial disease typically transmitted by drinking water being polluted by sewage. It was common in the 19th century cities, but has virtually disappeard from rich countries due to vaccinations and better public sanitation such as chlorination of drinking water and the building of effective sewerage systems.

Approximate Date	Country						
	U.S.	U.K.	Sweden	Norway	Netherlands	France	Austria/Hungary
1750	172	165	167	165			166
1800	173	167	166	166		163	163
1850	171	166	168	169	164	167	
1900	171	167	172	171	169	165	
1950	175	175	177	178	178	170	171

Sources: Gould (1869); Davenport and Love (1921); Sokoloff and Villaflor (1982); Fogel (1986); Eveleth and Tanner (1976); Floud, Wachter, and Gregory (1990); Sandberg and Steckel (1987); Vilhelm Kiil (1939); Brinkman, Drukker, and Slot (1988); Weir (1993); Komlos (1989).
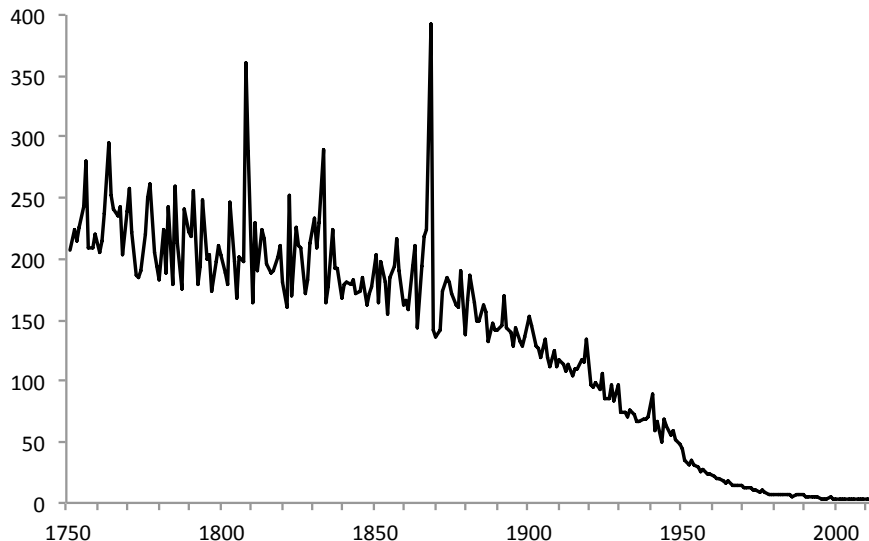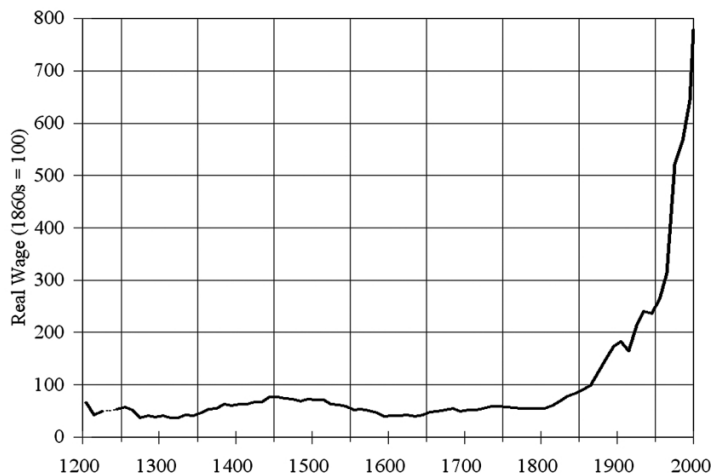
Based on 46,000 quotes of day wages, 90,000 quotes of the prices of 49 commodities, and 20,000 quotes of housing rents. Note that these numbers understate the improvements in the standard of living since they do not account for the introduction of new products and quality improvements of old ones.

Aggregate production is

$$Y = Af(K, L, X)$$

where A is total factor productivity and $f(\cdot)$ is a constant returns to scale production function (factors: capital, labor, land).

- Standard growth models provide a valuable framework to think systematically about the **proximate causes** of growth

- If technology, physical capital and human capital are so important, why do they differ across locations and time?
- In this course, we focus on the **fundamental causes** of growth
  - i.e. potential reasons for why the proximate causes vary
  - *complements* growth theory taught in macro courses

We will use four *complementary* approaches

1. Narrative history
   - the "story" of what happened and why
2. Formal models
   - internally consistent simplifications of the complex reality
3. Descriptive empirical work
   - careful measurement of what actually happened
4. Causal empirical work
   - (natural) experiments and/or quantitative economic models used to compare counterfactual states of the world

Prerequisites

- I aim to make this course as non-technical as possible, but basic knowledge of statistics / econometrics and causal inference is expected
  - point estimates, standard errors, confidence intervals, statistical significance, causality, correlation, sample...
  - basics of RCTs, dif-in-dif, selection on observables, intsrumental variables

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- Preparation lecutures: Introduction to Causal Inference
  - four lectures for our MSc students recorded in September 2021

Logistics

Outline of the course

1. **The Malthusian Era** (today)
2. Fundamental causes of growth
   1. Luck
   2. Geography
   3. Culture
   4. Institutions
3. Innovation and crises
   1. Technology
   2. Finance
4. Unleashing talent
   1. Migration
   2. Social mobility
   3. Gender

- Two assignments about paper-pairs listed in the syllabus
  - Due by Feb 7th and 21st (6pm) through MyCourses
- <u>Max.</u> 1,000 words, need to answer:
  - What are the "take-aways"? Why are they imporant?
  - What are the key assumptions? Are they plausible? Why (not)?
  - How do the papers contradict/complement each other?

Grading and Requirements: Assignments (50%)

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- You need to show that you understand what is *important*
  - answer *all* the questions, but nothing more
  - <u>underline key sentences</u>

Grading and Requirements: Assignments (50%)

- Looks easy, but is actually really hard. A few tips:
  - distinguish *assumptions* and *results*
  - explain *why* the assumptions are reasonable/questionable
    (what evidence is given to support them, what would be a plausible
    story for why the assumptions do not hold)
  - the papers can contradict each other at some points and
    complement each other in others
- See How to get a good grade at the course website for more

- In the week starting on Feb 21st, 13-16
  - I expect you to know the material covered in the lectures
  - passing the exam required for passing the course
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Grading and Requirements: Exam (50%)

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- How to prepare?
  - go through the lectures and make sure you understand them
  - see How to get a good grade at the course website for more

The Malthusian era

The Malthusian model

Reverend Thomas R. Malthus, 1766–1834.
One of the many English clergymen of his
time, who are still remembered today.

- In order to understand why some countries started to grow rapidly about two centuries ago, we first need to understand why they failed to do so earlier

- The main explanation is due to Thomas Malthus, whose book *An Essay on the Principle of Population* was first published in 1798.

The Malthusian model

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- Given these assumptions, the only way to achieve a permanent increase in per capita income is to restrict population

Steady-State in the Standard Malthusian Model

Voigtländer and Voth (2013)
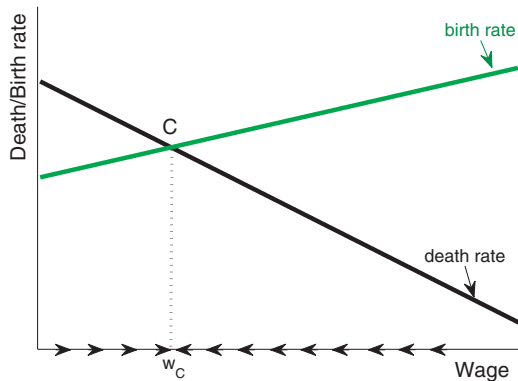
"Death rates are downward sloping in income, and birth rates are either flat or upward sloping. This generates a unique steady state (C) that pins down wages and population size. Decreasing marginal returns to labour set in quickly as population grows because fixed land is an important factor of production. A decline in population can raise wages, moving the economy to the right of C. However, the increase in output per capita is only temporary. Birth rates now exceed death rates and population grows, which in turn will depress wages—the "Iron Law of Wages" holds."

- Malthus presented the first coherent theory about how limited resources constraint economic growth
    - often mistakenly thought to be the reason for why economics is called the "dismall science"
- His key assumption is that technological progress is slow
    - given the historical record, this was a very reasonable assumption in 1798 (the irony is that the book was published just when technological innovation was about to explode)
- While the Malthusian model does poorly in explaining the period following its publication, it remains the workhorse model for explaining pre-Industrial economic growth

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- The Malthusian hypothesis:
  - in the "short-run" per capita income fluctuates with population (population $\downarrow$ $\rightarrow$ wages $\uparrow$ $\rightarrow$ population $\uparrow$ $\rightarrow$ wages $\downarrow$ $\rightarrow$ population $\downarrow$)

- So, setting aside all practical and ethical considerations, we could think of something like
  - let's select 10,000 locations as our study population
  - randomize 5,000 to treatment, 5,000 to control groups
  - remove 50% of the population from the treatment locations
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- Potential natural experiment: sudden decrease in population
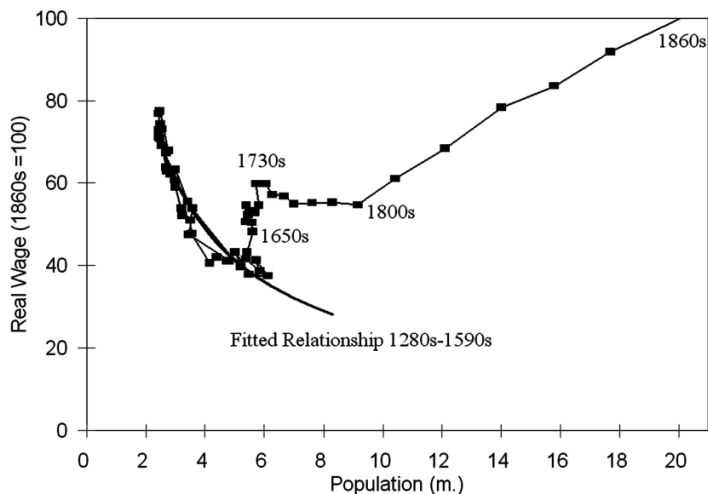 - e.g. the Plague killed between one third and one half of the European population in 1348–50
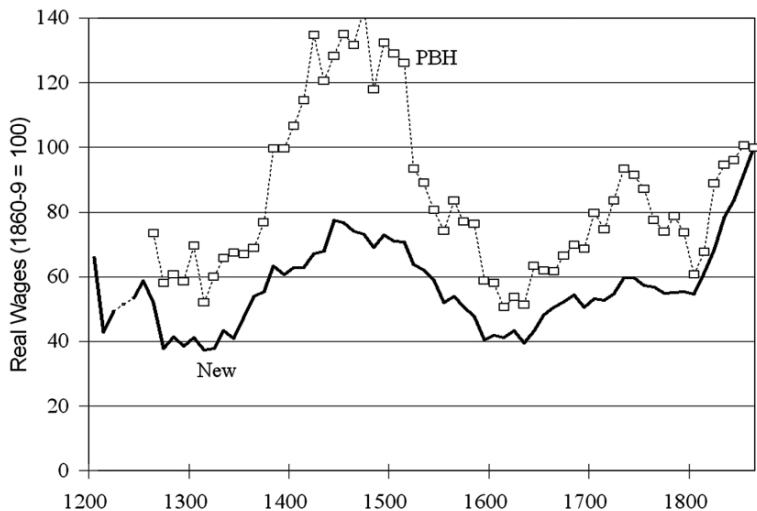
Note: PBH refers to the earlier estimates by Phelps Brown and Hopkins (1981)

"[...] the break from the Malthusian era of little advance in efficiency in England began circa 1640, long before the famous Industrial Revolution, and before even the emergence of the modern political regime in England in 1689"

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  - *many* things likely to affect aggregate wages and population
  - solution: control group that faces the same aggregate shocks as the treatment group

Testing the Malthusian model: the Plague

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    $\rightarrow$ hard to find comparable contol groups
- Next: a better natural experiment
  - Spain's expulsion Moriscos in 1609

Spain's converted Muslims ("Moriscos") were given three days to leave their homes and board ships destined for foreign lands in 1609.

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  - In the Kingdom of Valencia, 1/3 of the population was expelled

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- CH examine the impact of the expulsion to later population growth and agricultural output in Valencia and find that it
  - decreased total output, increased per capita output
  - extractive institutions persisted

- Background
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- 1808: Napoleon abolishes the Spanish seignorial regime

Data
Chaney, Hornbeck (2016)

- Production data from tithing auctions
  - the Archbishopric entitled to about 10% of agricultural output
  - rather than directly collect agricultural goods, the Archbishopric auctioned the right to collect its share
  - winning bid value by district and time are available

- Population data
  - historical maps: geographic area of each tithing district
  - population data: town recods for 1569, 1609, 1622, 1646, 1692, 1712, 1730, 1768, and 1786

- Compare *changes* in districts hardest hit to *changes* in districts that were less affected (had fewer Moriscos in 1609)

Differences-in-differences approach
Chaney, Hornbeck (2016)

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- Limitations

  - Malthusian theory implies an explicit dynamic relationship
    (districts' growth rate depends on their initial outcome value)
  - Morisco and Christian different already prior to the expulsion
    $\rightarrow$ they *should* experience differential growth

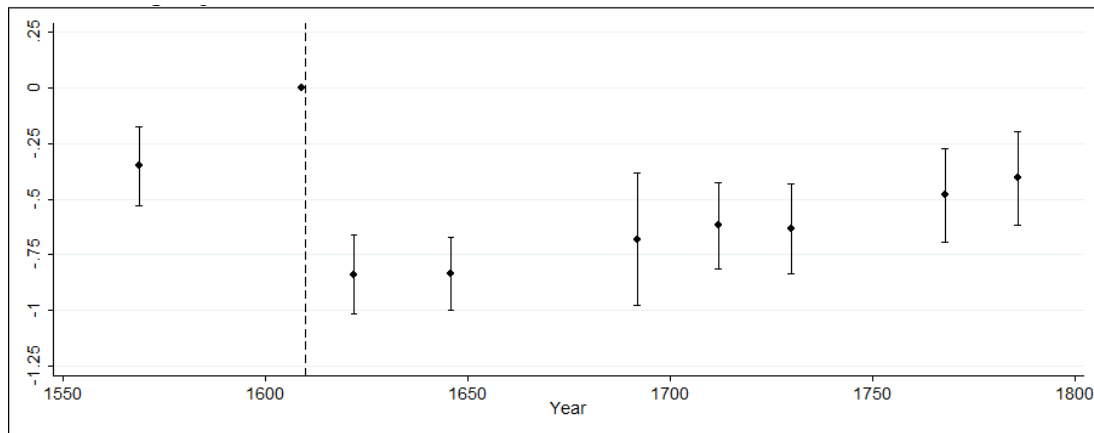# Morisco Population Share in 1609
Chaney, Hornbeck (2016)
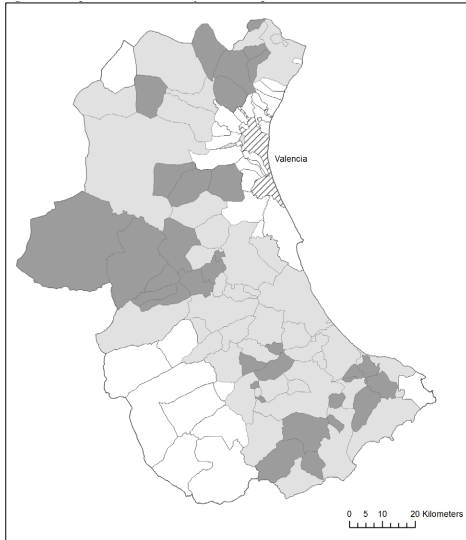
- 0% Morisco in 31 districts (white)
- 0–100% Morisco in 36 districts (light gray)
- 100% Morisco in 31 districts (medium gray)
- In the second category, Morisco communities were largely segregated and their average population share was 50%.

Changes in log population
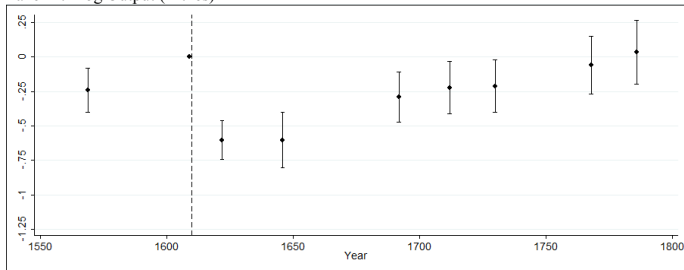Chaney, Hornbeck (2016)

Estimates for β_t from regression $\ln P_{dt} = \beta_t Morisco_d + \alpha_t + \alpha_d + \gamma_t X_d + \epsilon_{dt}$, where P_{dt} is the population of district d in year t, $Morisco_d$ is the population share of Moriscos in 1609, year fixed-effects α_t capture changes common to all districts, district fixed effects α_d capture time-invariant unobservable differences across districts and X_d is a vector of geographic characteristics. The solid circles indicate the point estimates in each year, relative to the omitted base year of 1609, and the vertical lines indicate 95% confidence intervals.
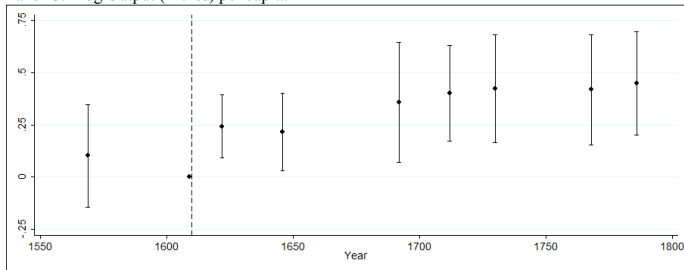
Changes in log output, output per capita
Chaney, Hornbeck (2016)

Panel B. Log Output (Tithes)

Panel C. Log Output (Tithes) per capita

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- Do the results invalidate the Malthusian model?
  - no, if disposable income did not rise with output per capita
  - also: estimates for the entire sample region indicate generally fast convergence in population and output

Summary

- Course logistics
  - 2 assignments (25% each), final exam (50%)
- The Malthusian model
  - population increases with income
  - negative returns to scale
  - slow technological progress
    $\rightarrow$ per capita income can increase only through population limitation
- Testing the Malthusian model
  - plague, moriscos

- Voigtländer, Voth (2013): How the West "Invented" Fertility Restriction. *American Economic Review*, 103(6): 2227-64
  - This paper argues that the Plague in 1348–1350 improved female labor market prospects by triggering a shift towards the pastoral sector. As a consequence, the European Marriage Pattern (later marriage) emerged and reduced childbirths by approximately one-third.
- Beach, Hanlon (2021): Culture and the Historical Fertility Transition. WP
  - This paper argues that a famous trial in 1877 revolving around the morality of family planning led to a sharp decline in fertility in Britain.