

Econ 135: Day 3: Malthusian Logics



Week 2: Days 3-4: 2. Ensorcelled by the Devil of Malthus: 2.1. Malthusian Logics; 2.2. Efflorescences and Dark Ages



Econ 135 S 2023: WEEK 2: Days 3 & 4: 2. Ensorcelled by the Devil of Malthus

[J. Bradford DeLONG](#)

All Sections

Jan 19 at 4:21am

Lecture Notes:

2022-01-24 Tu: [Malthusian Logic](#)

2022-01-26 Th: [Efflorescences & Dark Ages in the Agrarian Age](#)

Required Readings:

Clark: [A Farewell to Alms](#) chs. 2-5

Jack Goldstone (2002); [Efflorescences and Economic Growth in World History](#);

Willem Jongman (2007): [Gibbon was Right: The Decline and Fall of the Roman Economy](#)

Optional Readings:

Brad DeLong: *Lecture Notes: The Solow Growth Model*; *Lecture Notes: Malthusian Economies* <<http://datahub.berkeley.edu/user-redirect/interact?account=braddelong&repo=history-of-economic-growth-theory-readings&branch=main&path=heg-growth-theory.ipynb>>

Josiah Ober (2020): [Agamemnon's Cluelessness](#) ;

Peter Temin: [The Roman Market Economy, Roman Growth](#)

Syllabus: <<https://bcourses.berkeley.edu/courses/1522040/files?preview=85130561>>

Course Logistics Discussion: <https://bcourses.berkeley.edu/courses/1522040/discussion_topics/6496784>

Week 1: Days 1-2: 1. Introduction: 1.1. Five Questions About Economic Growth; 1.2. Quantitative Guesses



Econ 135 S 2023: WEEK 1: Days 1 & 2: 1. Introduction: Five Questions About Economic Growth

Jan 14 at 7:09am

[J. Bradford DeLONG](#)

All Sections

Lecture Notes:

2022-01-17 Tu: [Introduction: Economic Growth in Historical Perspective \(link to slides on page\)](#) ; course capture video: <https://bcourses.berkeley.edu/>

2022-01-19 Th: [Numerical Guesses at the Quantitative Picture of Long-Run Economic Growth \(link to slides on page\)](#)

Required Readings:

Clark: [A Farewell to Alms](#) ch. 1

Allen: [Global Economic History](#) ch. 1

DeLong: [Slouching Towards Utopia](#) Intro.

Greg Clark (2005): [The Condition of the Working Class in England, 1209-2004](#) ... (long: II. Wages and the Timing and Causes of the Industrial Revolution; III. The Consequences of the Industrial Revolution; I. & IV. Introduction & Conclusion)

Optional Readings:

Doug Jones (2022): [Toba, or the Sperm Whale Effect?](#) ...

Monika Karmin & al. (2015): [A Recent Bottleneck of Y-Chromosome Diversity Coincides with a Global Change in Culture](#) ...

Jared Diamond (1987): [The Worst Mistake in the History of the Human Race](#) ...

Doug Jones (2022): [The Patriarchal Age](#) ...

Andy Matuschak (2022): [Why Books Don't Work](#) ...

Syllabus: <https://bcourses.berkeley.edu/courses/1522040/files?preview=85130561>>

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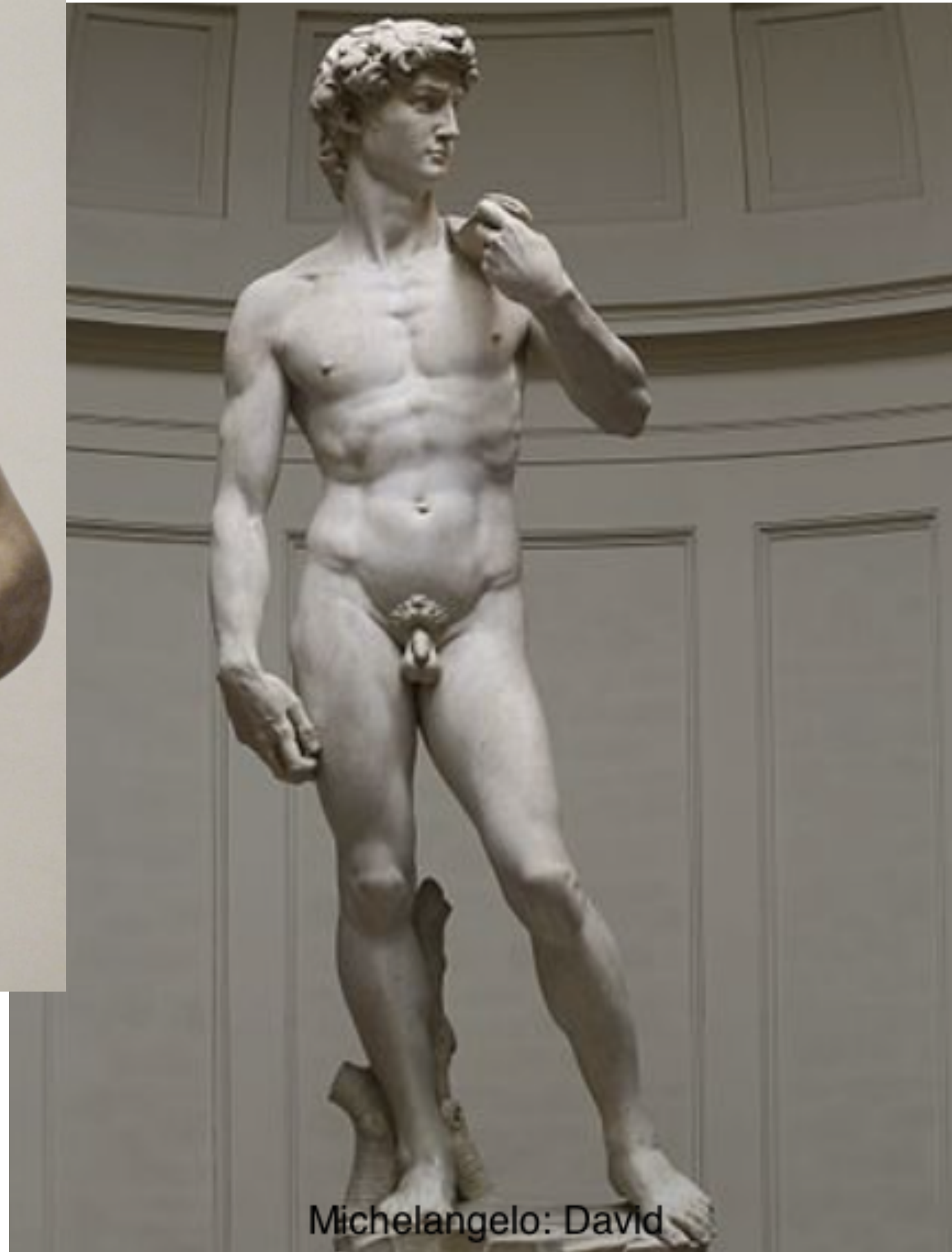
Guesses at Longest-Run Global Growth

Date	Real Income/ Capita y	Popula- tion P (millions)	Total Income Y (billions)	Ideas Stock Level H	Ideas Growth Rate h			Population Growth n	Efficiency- Growth g
-8000	\$1,200	2.04	\$2.4	0.037	0.003%		Neolithic revolution	0.006%	0.000%
-6000	\$900	5.09	\$4.6	0.043	0.009%		“Tribal” mode of production	0.046%	-0.014%
-4000	\$900	10.5	\$9	0.062	0.018%		Final start of “urbanization”?	0.036%	0.000%
-3000	\$900	15	\$14	0.075	0.018%		Start of Bronze-Literacy age	0.037%	0.000%
-1500	\$900	37	\$33	0.117	0.030%		Bronze-Literacy mode of pro	0.060%	0.000%
-1000	\$900	50	\$45	0.136	0.030%		Start of Iron age	0.060%	0.000%
-400	\$900	103	\$93	0.195	0.060%		“Ancient” mode of domination	0.120%	0.000%
150	\$900	200	\$180	0.272	0.060%		High Antiquity	0.121%	0.000%
800	\$900	240	\$216	0.297	0.014%		Late-Antiquity Pause	0.028%	0.000%
1000	\$900	296	\$266	0.330	0.052%		Feudal mode of production	0.105%	0.000%
1500	\$900	500	\$450	0.429	0.052%		Commercial-Gunpowder-Empire	0.105%	0.000%
1770	\$1,100	750	\$825	0.643	0.149%		Imperial-Commercial Revolution	0.150%	0.074%
1870	\$1,300	1299	\$1,689	1.000	0.442%		Steampower mode of produc	0.550%	0.167%
1930	\$3,000	1909	\$5,727	3.000	1.714%		Second-Industrial-Revolution	0.641%	1.394%
1975	\$6,000	3678	\$22,069	9.000	2.269%		Mass-Production mode of pr	1.457%	1.540%
2020	\$12,000	7566	\$90,794	27.000	2.342%		Global-Value-Chain mode of	1.603%	1.540%
2100	\$50,000	10000	\$499,990	129.333	1.958%	?	Into the Future?	0.349%	1.784%
2200	\$447,821	10000	\$4,478,208	955.651	2.000%	?		0.000%	2.192%
2500	\$180,663,805	10000	\$1,806,638,050	385537.29	2.000%	?		0.000%	2.000%

The Puzzle of the Malthusian Agrarian Economy: Readings and Questions



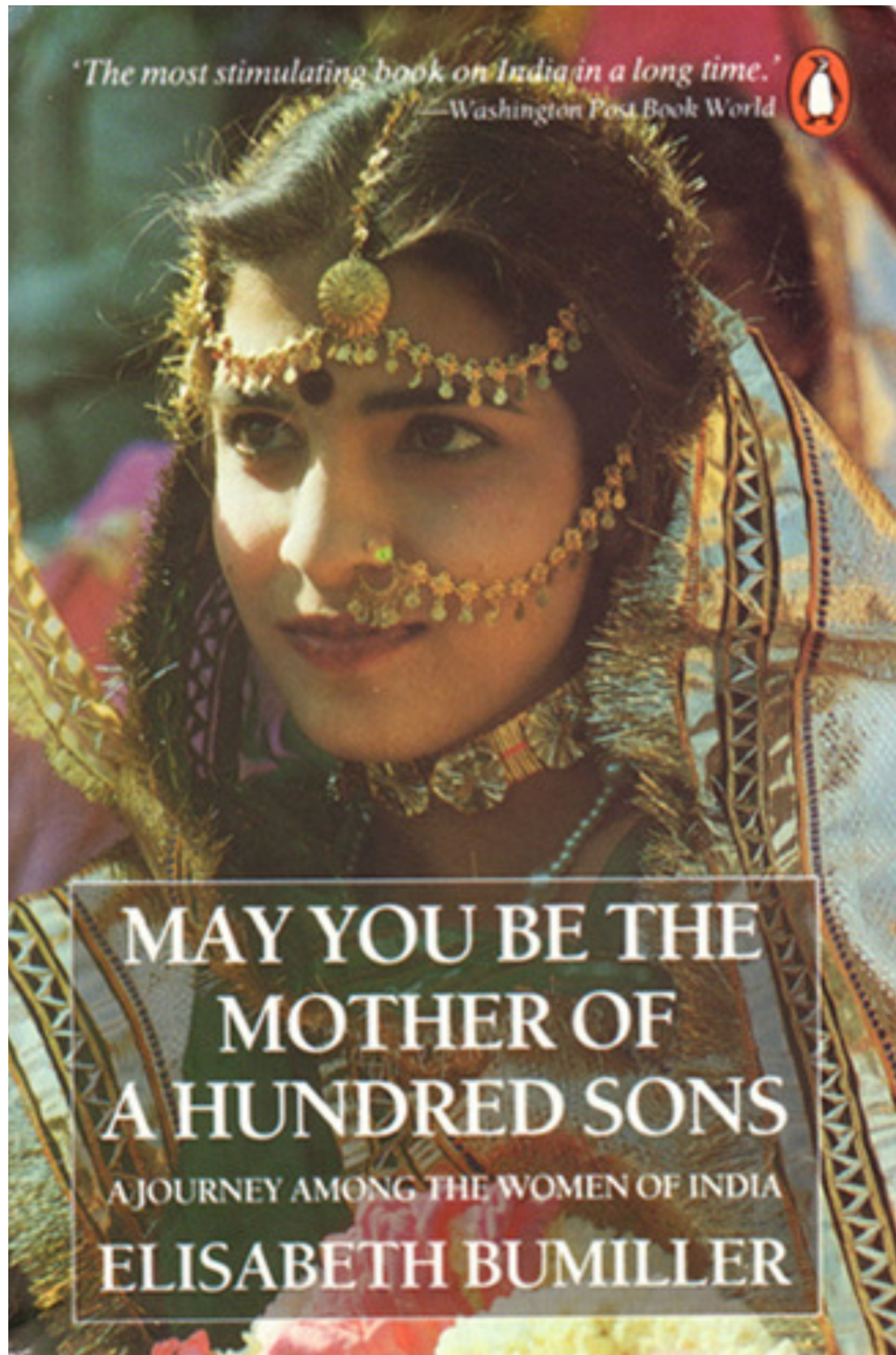
Aphrodite of Knidos (copy): Praxiteles, Phryne



Michelangelo: David

- “Ancient” Ain’t “Primitive” or “Unsophisticated”, Is It?
- Could we teach:
 - Themistokles or Augustus much about politics?
 - Homer much about writing poetry?
 - Gaius Julius Caesar or Leonidas much about generalship?
 - Sophokles much about drama?
 - Phryne much about presentation-of-self-as-celebrity?
 - Michelangelo di Lodovico Buonarroti Simon much about painting ceilings?
 - Praxiteles much about sculpture?
 - Johann Sebastian Bach much about music?
- And yet, as far as the *economy* is concerned...

Malthusian Demography



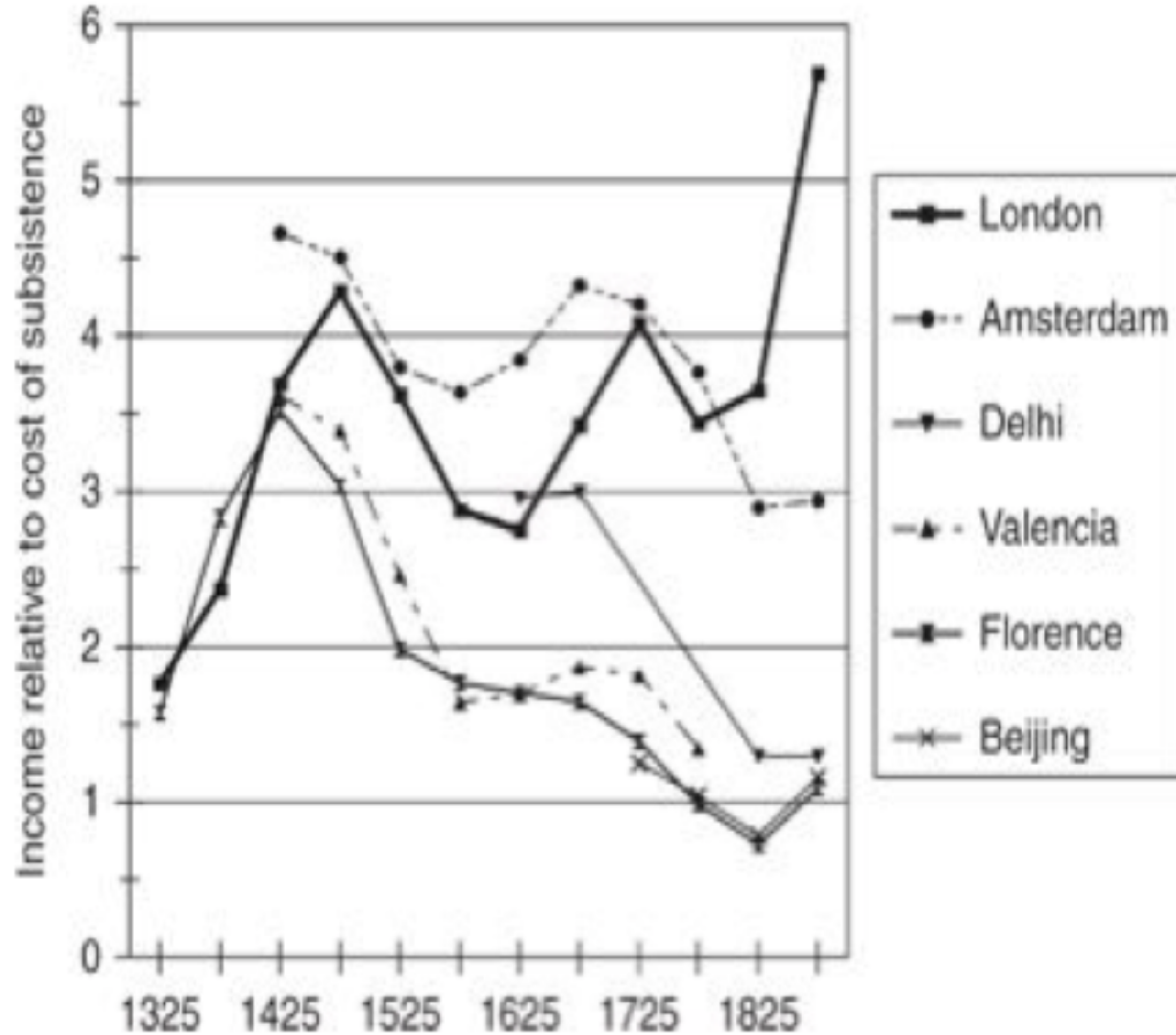
Social power depends on being the mother (or father, uncle) of sons:

- Technological progress is slow
- So population nearly stable
- Thus the average mother has only one son surviving to reproduce
- Some have two or three, and some have zero
- Hence very strong pressure to have as many as possible, in the hope that one will survive

- Slow population growth: average number of sons near 1
- Poisson distribution
- Two children survive to reproduce
- Three live to adulthood
- 4.5 survive to age 5
- 6.5 live births
- 9 pregnancies, with miscarriages and stillbirths

$9 \times 9 = 81/12 =$ more than 6 years pregnant
15 years breastfeeding
21 years eating for two
1 in 7 dead in childbed?

Agrarian Near Stagnation



	quantity per man per year	calories per day	protein (grams) per day
food			
grain	167 kg	1657	72
beans	20 kg	187	14
meat	5 kg	34	3
butter	3 kg	60	0
total		1938	89
non-food			
soap	1.3 kg		
linen/cotton	3 metres		
candles	1.3 kg		
lamp oil	1.3 litres		
fuel	2.0 Million British Thermal Units		

The H Index: $H=0.037, 0.27, 0.43$

Technology in Ceramics, -8000 to 1500: Jomon, Roman, Ming



Simulating a Malthusian Economy

$$\frac{1}{y} \frac{dy}{dt} = g$$

$$\frac{1}{L} \frac{dL}{dt} = n$$

$$g = h - n/\gamma$$

$$n = \beta \left(\frac{y}{y^{sub}} - 1 \right)$$

$$n^* = h\gamma$$

$$\frac{y^*}{y^{sub}} = \frac{h\gamma}{\beta} + 1$$

```
: %matplotlib inline

: import numpy as np
import matplotlib.pyplot as plt
import random as rnd

g = []
n = []
epsilon = []
L = [1]
y = [1.25]

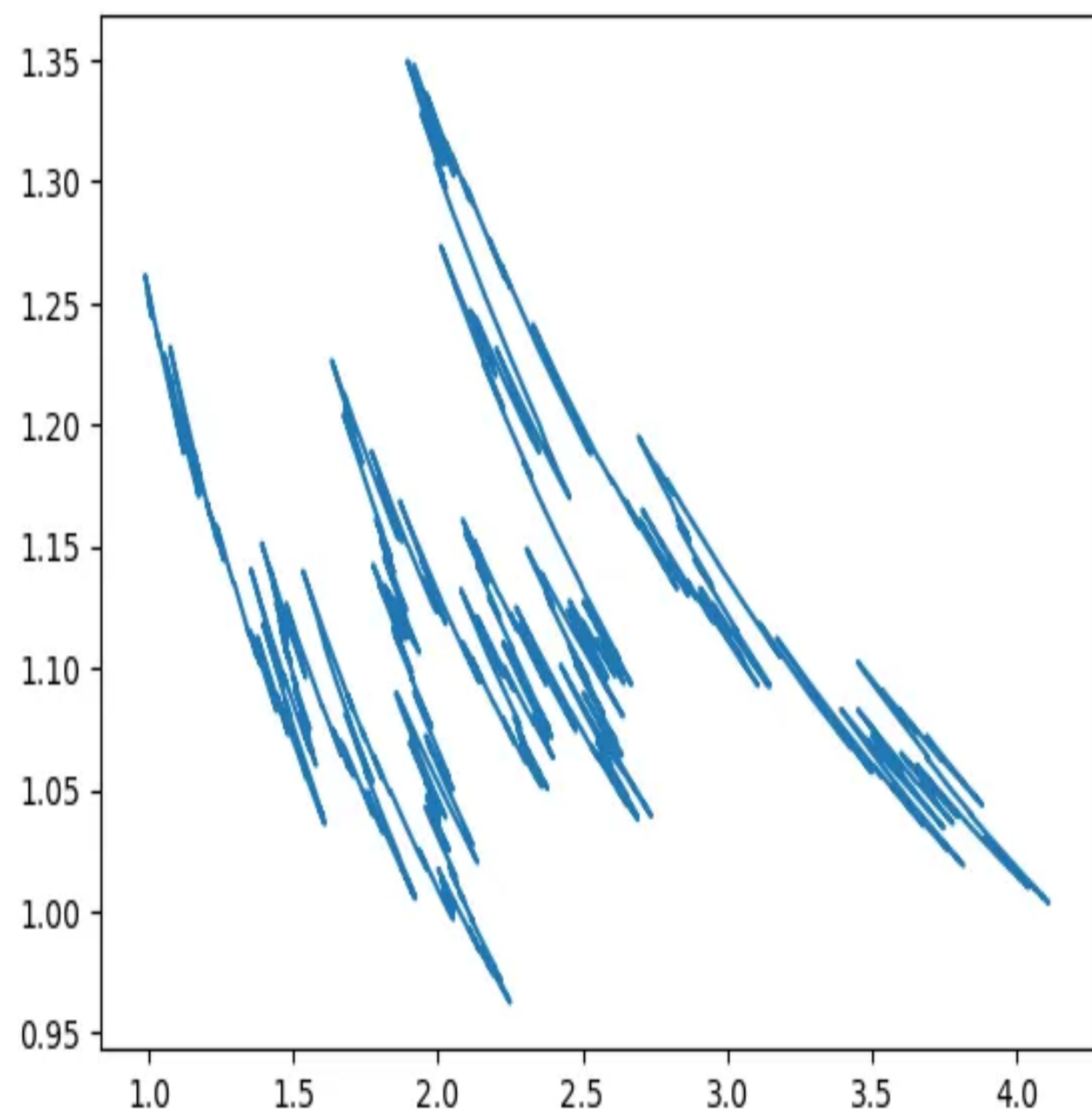
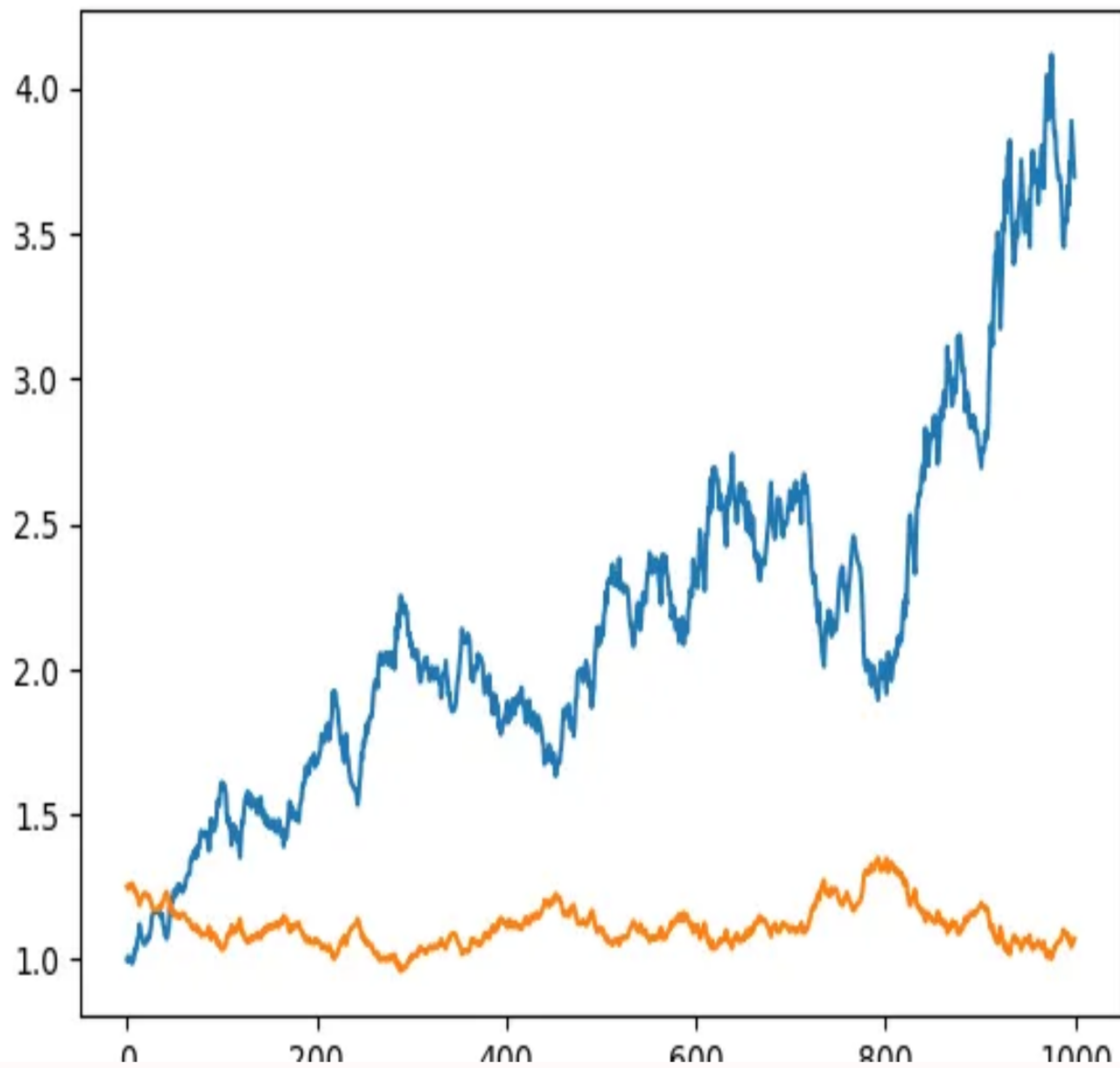
h = 0.0005
gamma = 2
beta = 0.025

for t in range(999):
    epsilon = epsilon + [rnd.normalvariate(0, 0.02)]
    n = n + [beta * (y[t] - 1) + epsilon[t]]
    g = g + [h - n[t]/gamma]
    y = y + [y[t]*np.exp(g[t])]
    L = L + [L[t]*np.exp(n[t])]

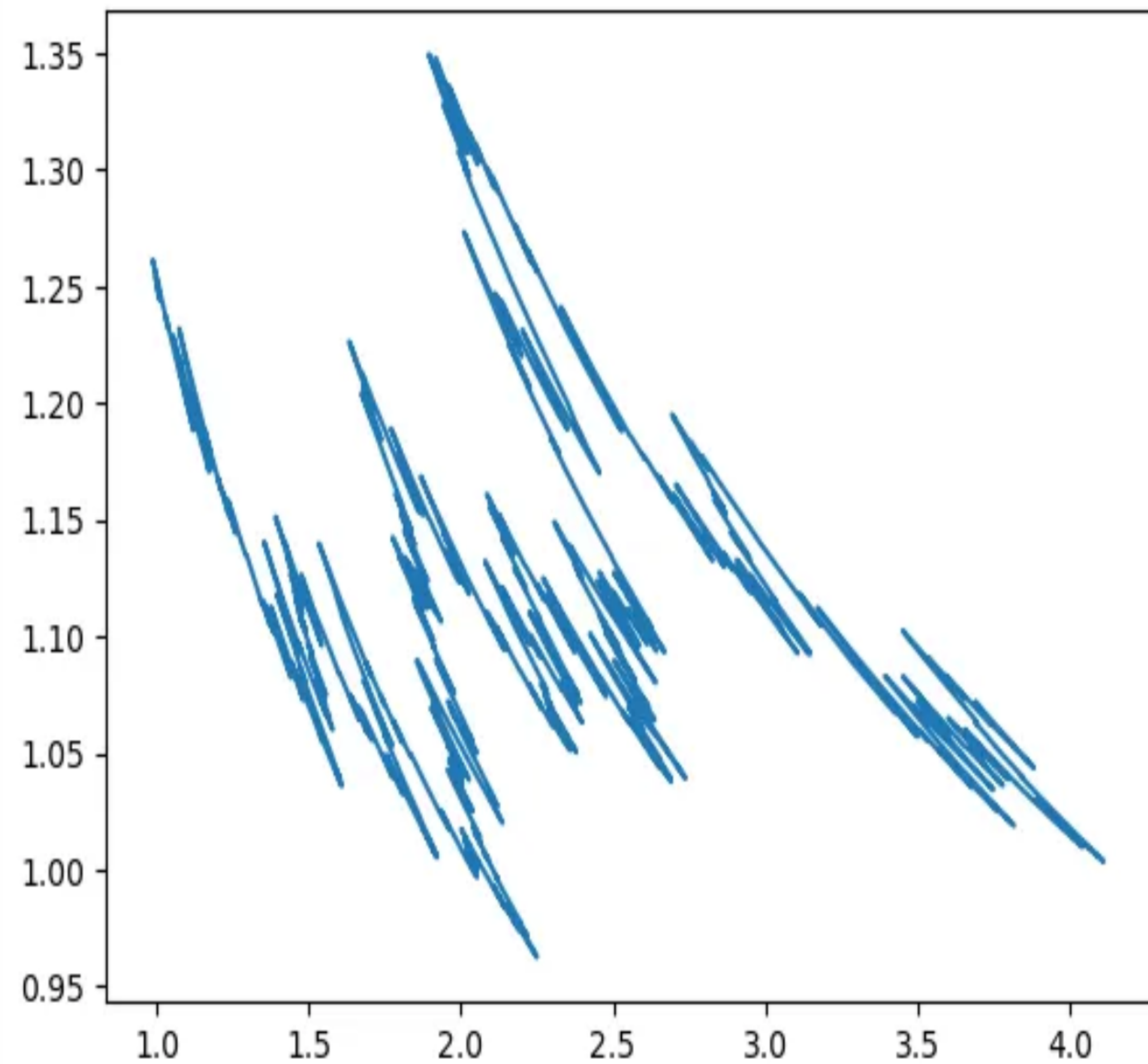
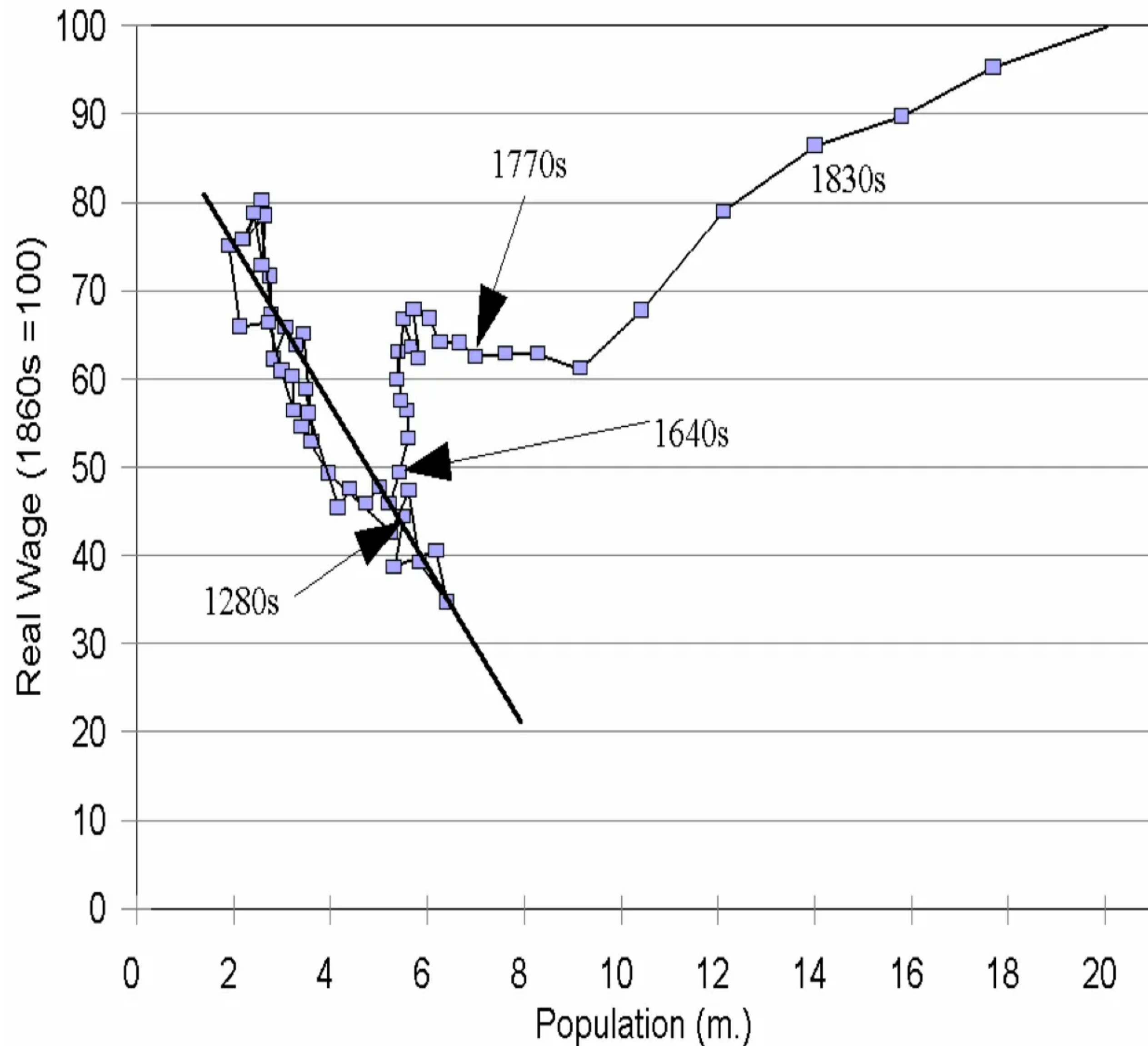
tseries = range(1000)
fig, ax = plt.subplots()

ax.plot(tseries, L, v)
```

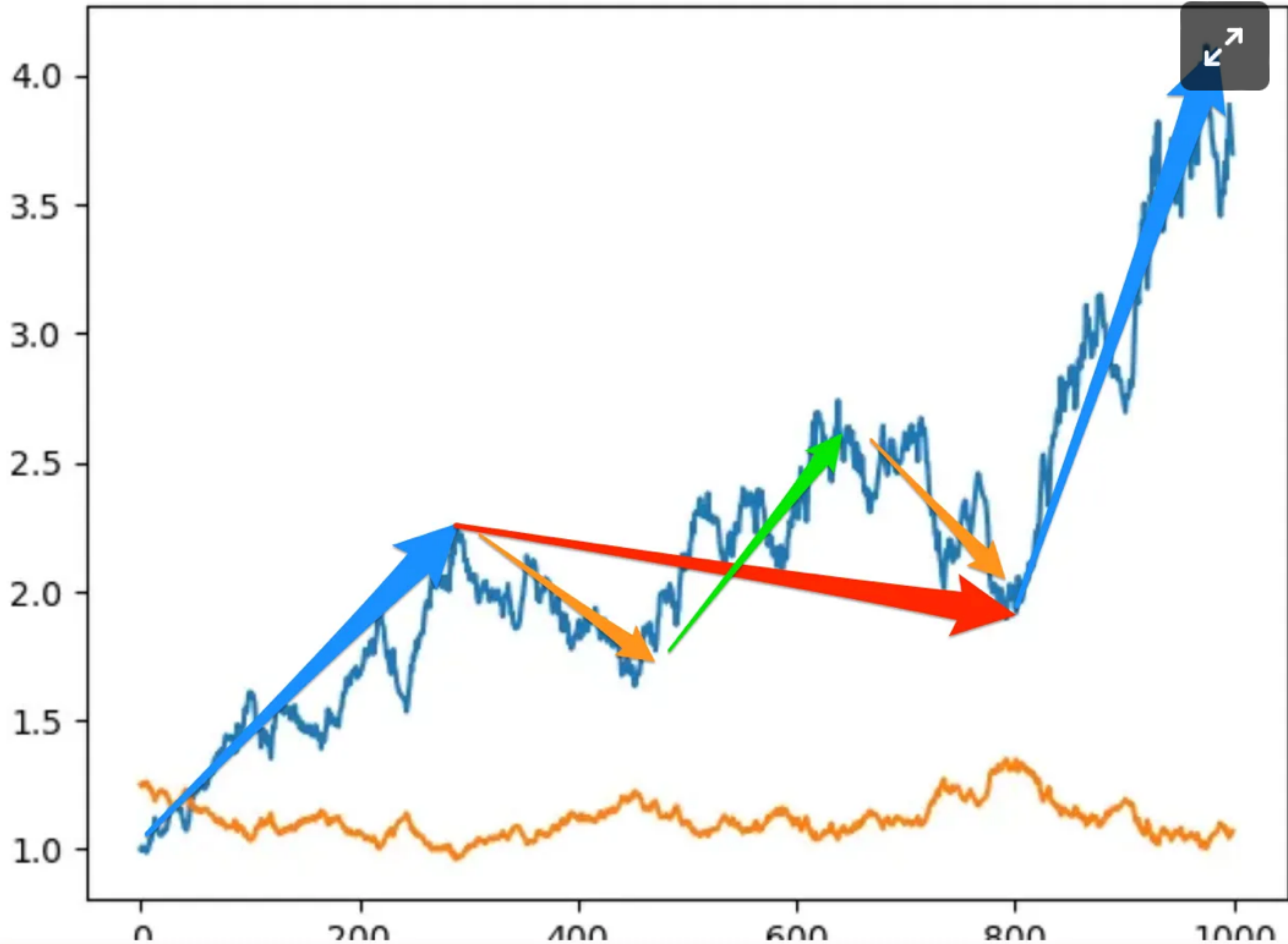
Sample Results



Cf. English History



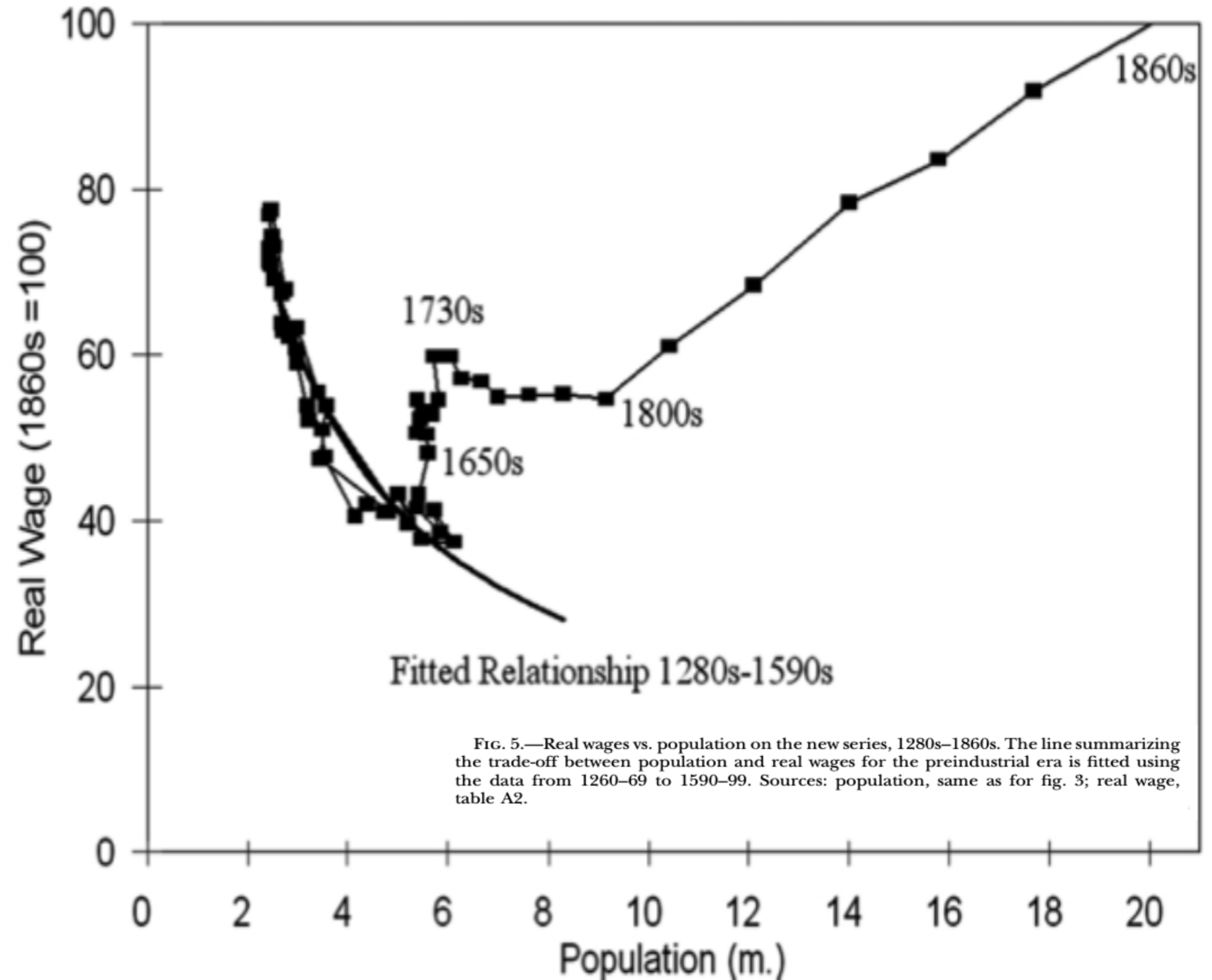
“Overfitting”



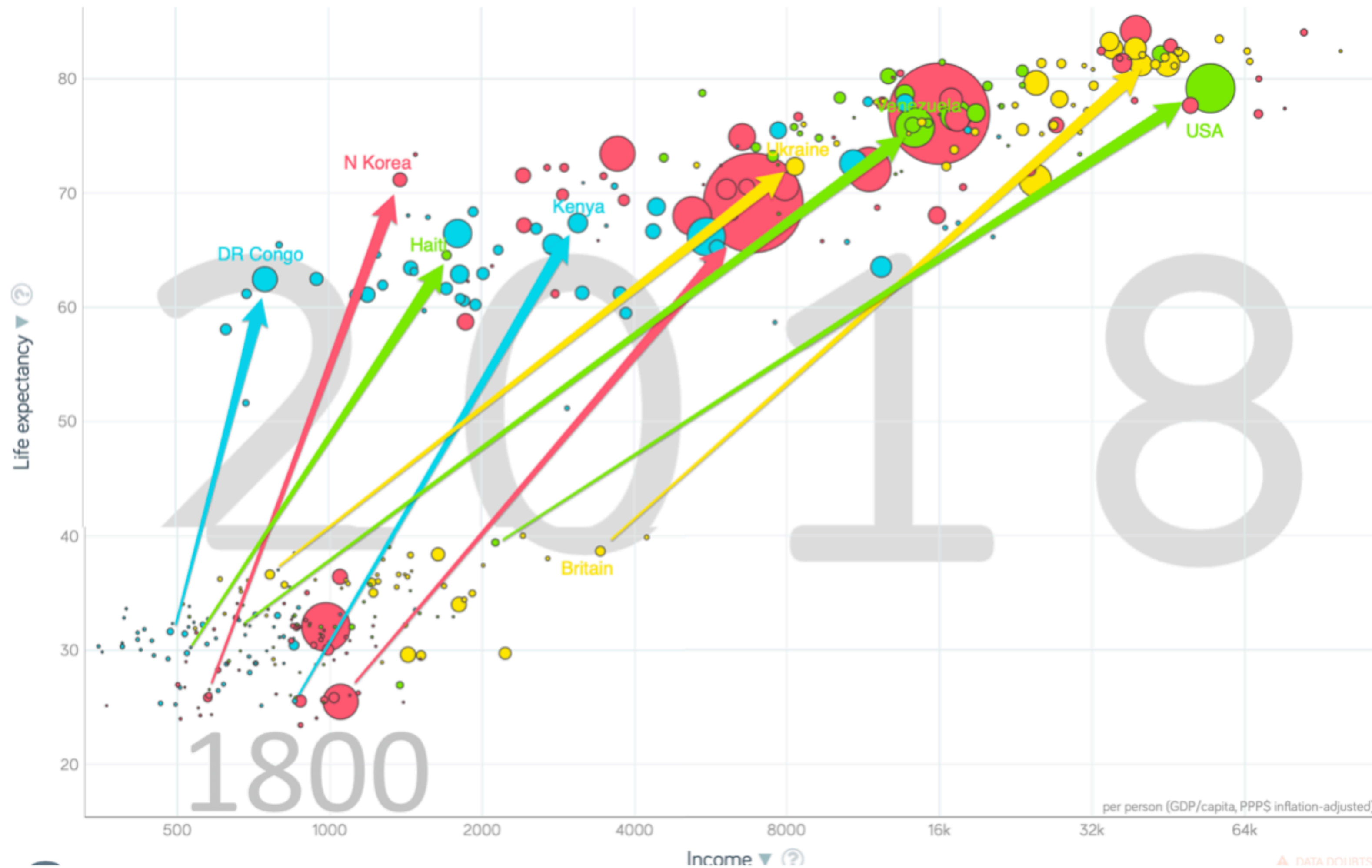
Escape

From Clark: Condition of Working Class in England:

- Moving back-and-forth along a stable Malthusian curve from 1280 to 1640
- Then breakout: real wage rises to the 1730s
- Then population rises without real wage falling until the 1800s
- By 1800, real wage 33% above and population double level of 1640
- And then the Industrial Revolution takes hold: real wages up by 80% and population doubling again in two generations



Global Divergence: The Nation-States

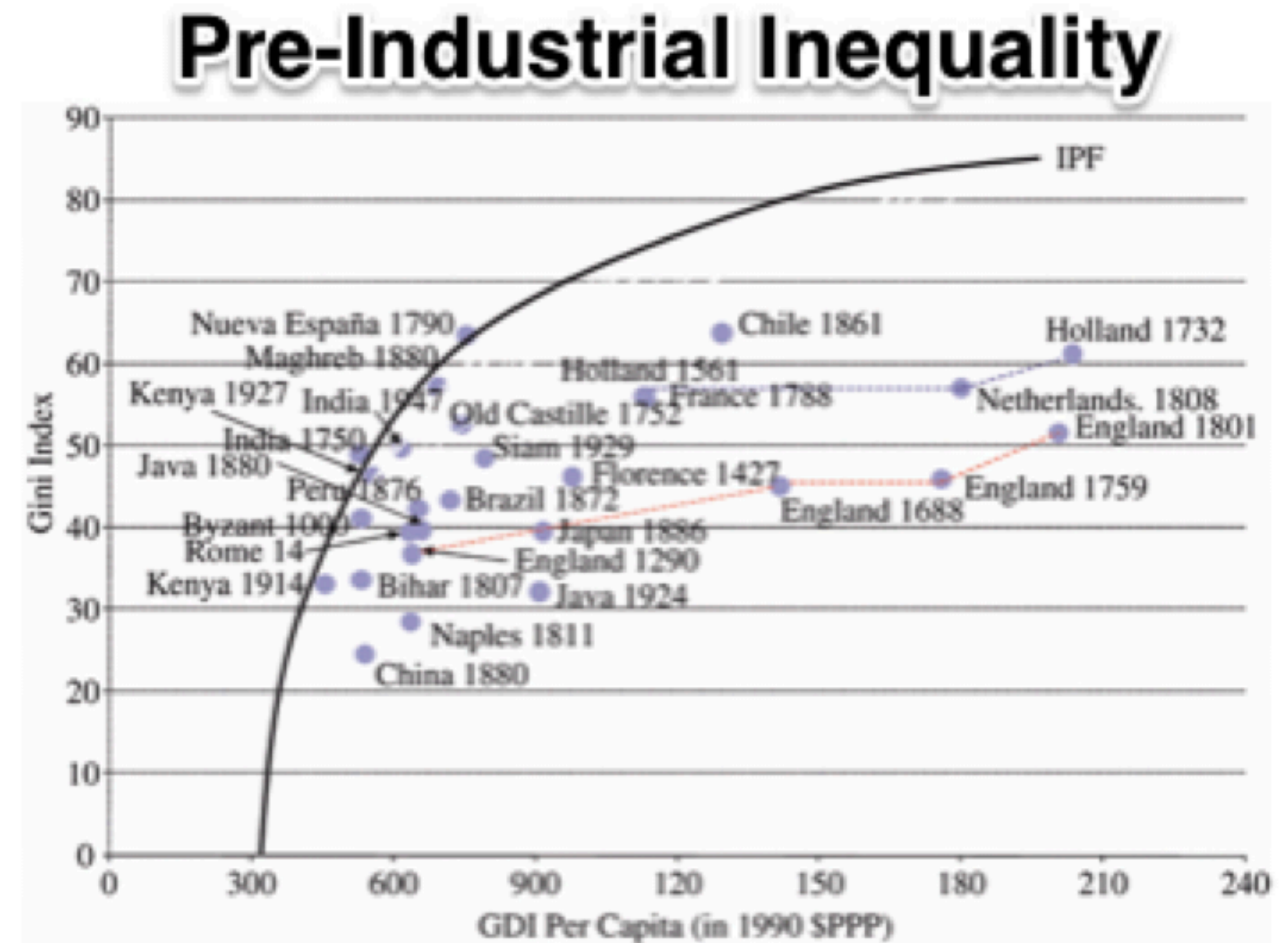


From 1800 to 2018:

- The dots start with a 3-1 spread in incomes and a 10-year spread in life expectancy.
- All the arrows go up.
- Some arrows—mostly those already to the right—go right fast.
- Other arrows go right slowly.

Domination & Plutocracy

- Ever since the invention of agriculture
- Becoming a trained-thug-with-a-spear
- The exploitative are hard targets
- The productive are soft targets
- Agrarian-Age as unequal as it could be
- No Commercial-Age reduction in inequality
- On the other hand, no big increase
- And domination mattered less—perhaps

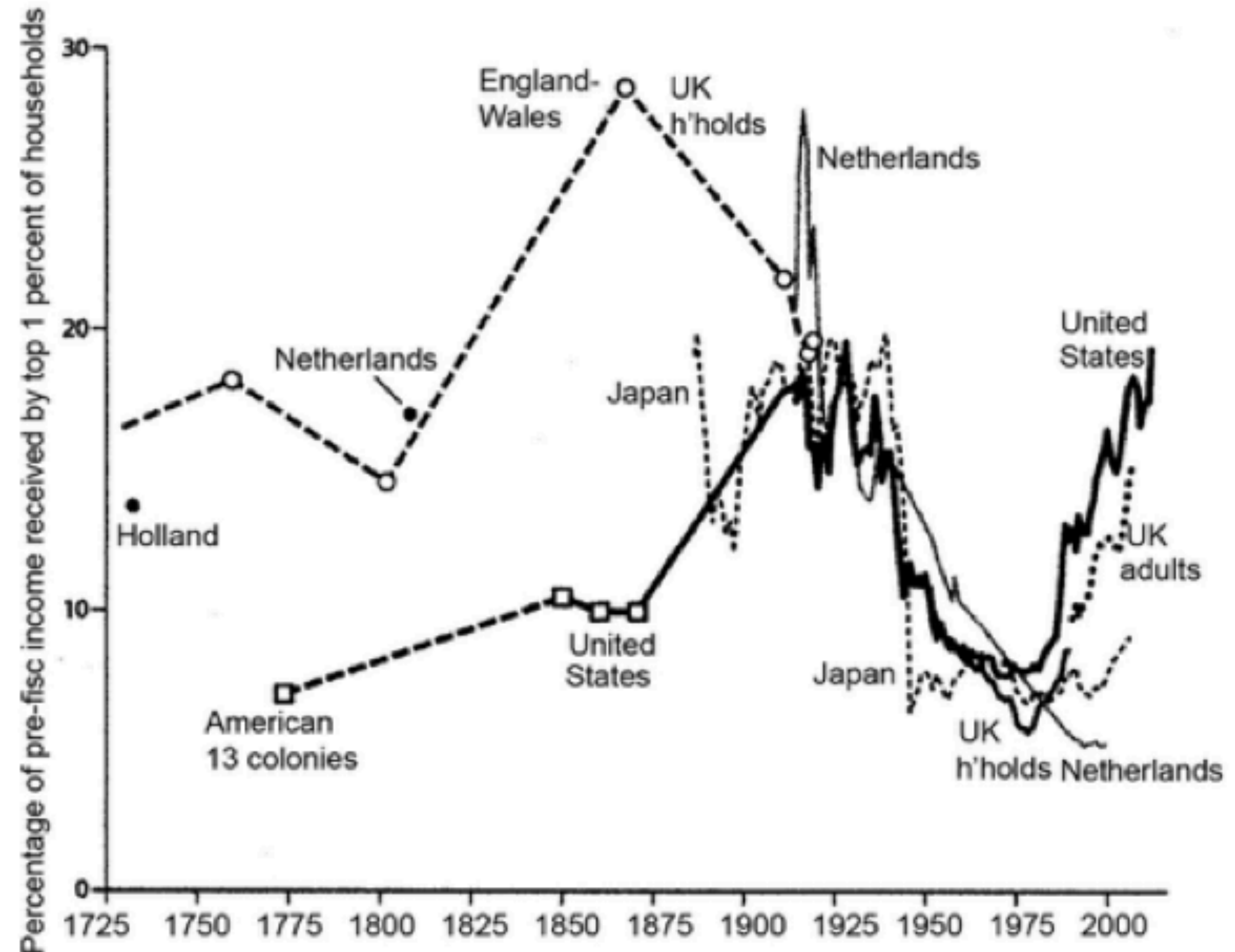


Branko Milanovic, Peter Lindert, and Jeffrey Williamson (2010): Pre-Industrial Inequality <<http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0297.2010.02403.x/full>>

Commercial-Industrial-Modern Economic Growth Inequality

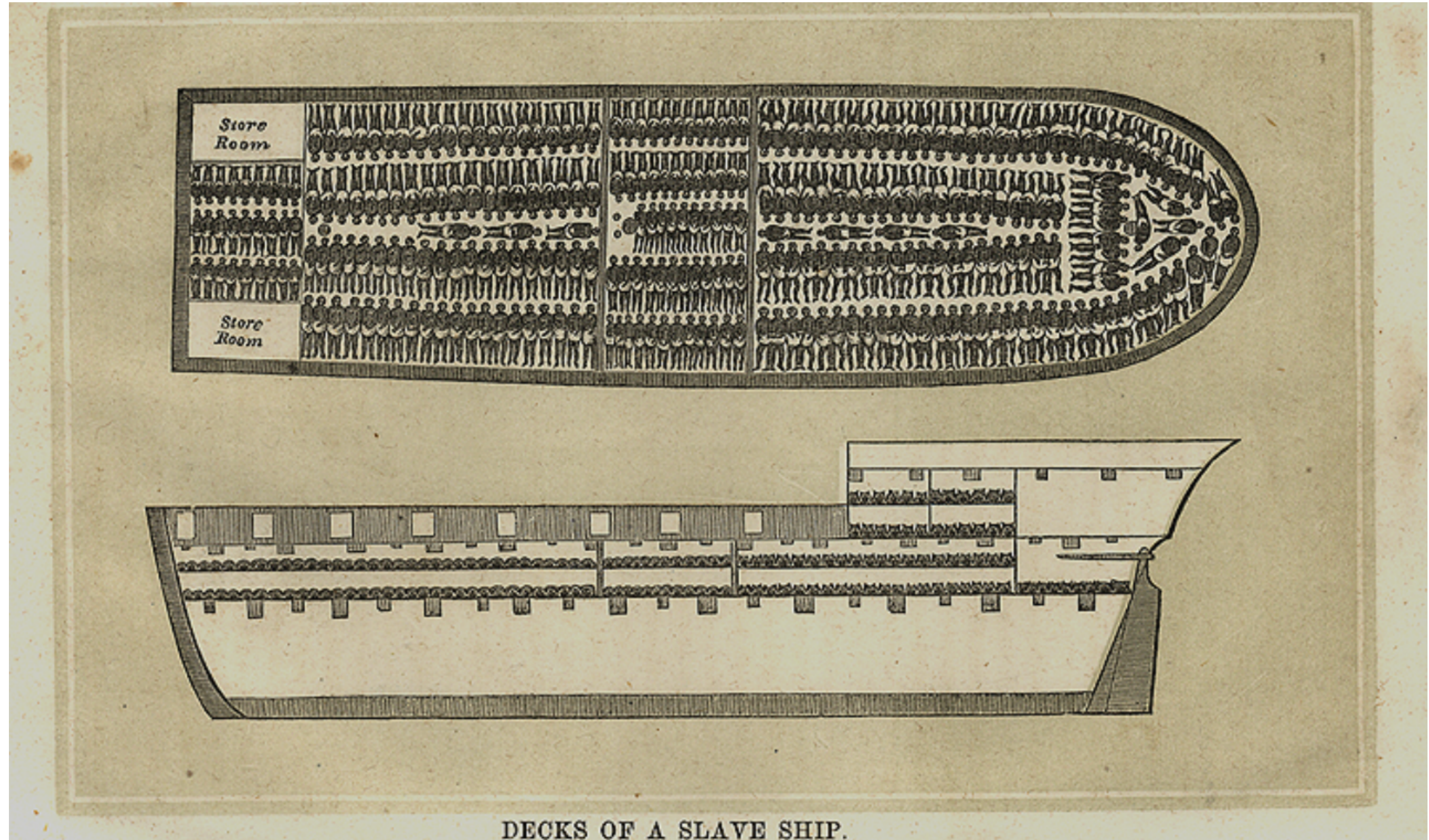
- “Top 1%” not static...
- Waves:
 - First Gilded Age
 - Age of Social Democracy
 - Second Gilded Age
- American numbers wrong

Figure 3 Income share received by the top 1%, four countries over two centuries



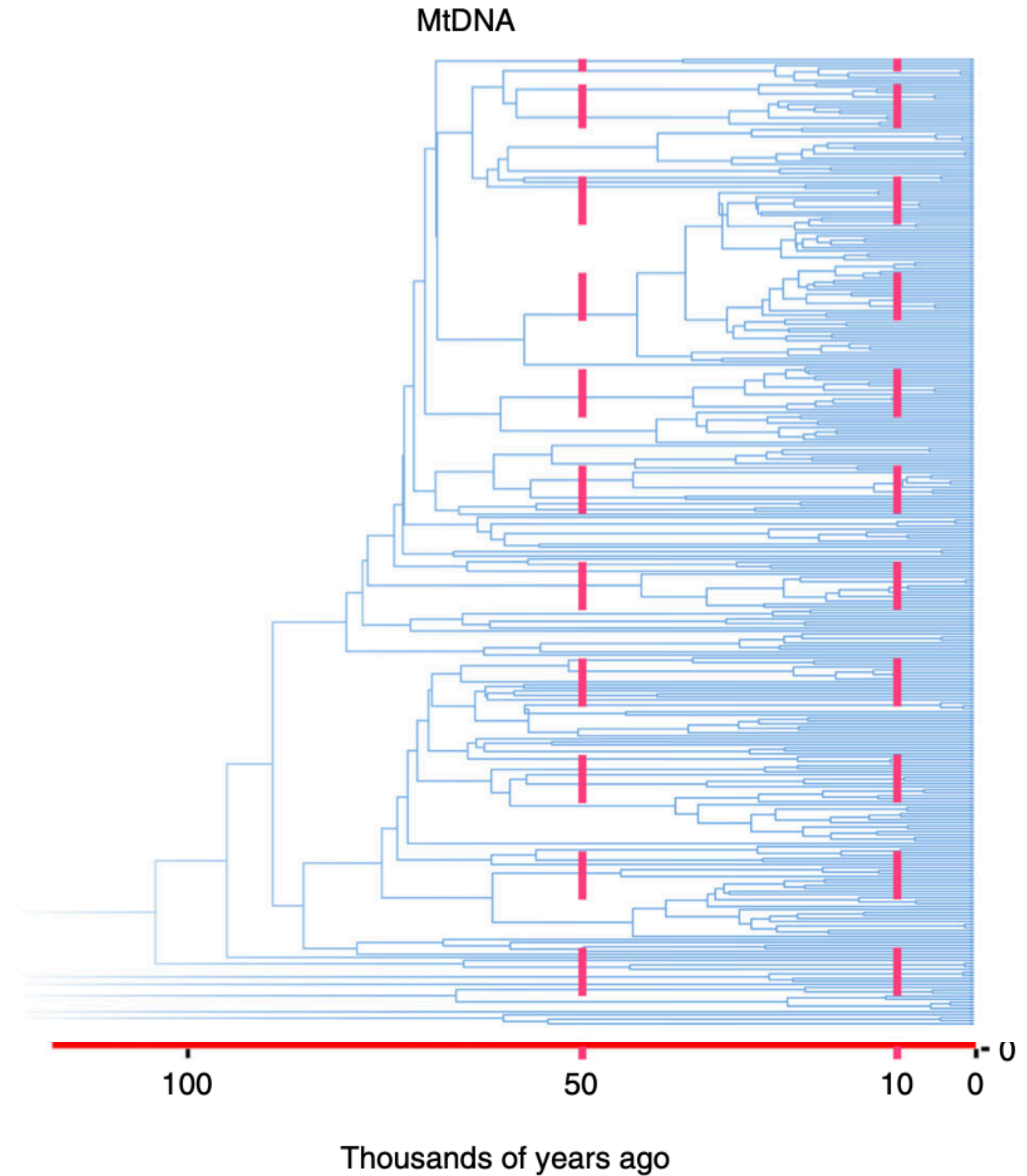
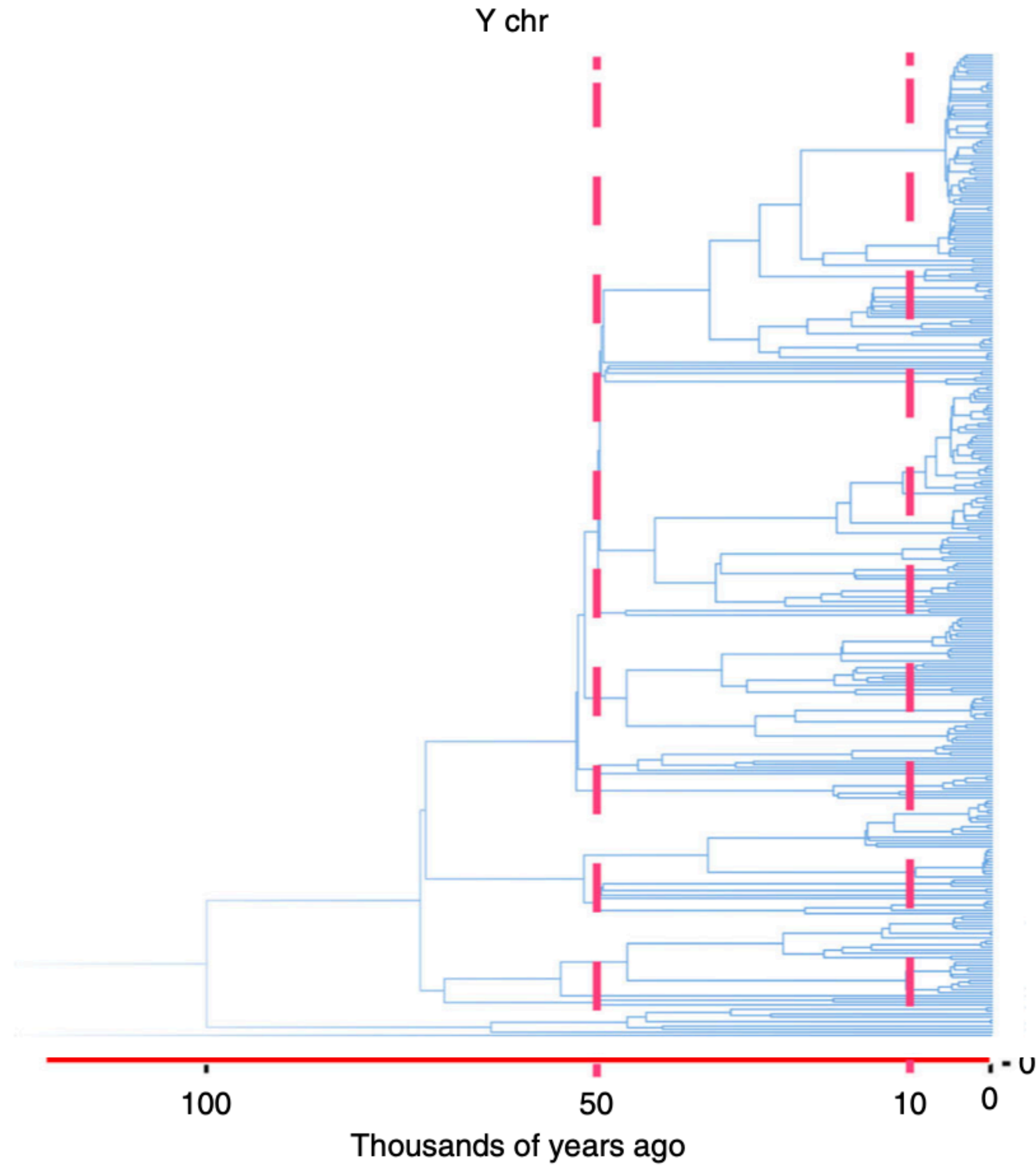
Slavery & Status

- Plantation
- Household
- Serfdom
- Sharecropping
- Debt
- Wage-work
- Renter
- Freehold



DECKS OF A SLAVE SHIP.

Patriarchy: Genetic Divergence



Patriarchy: Effective Population Size

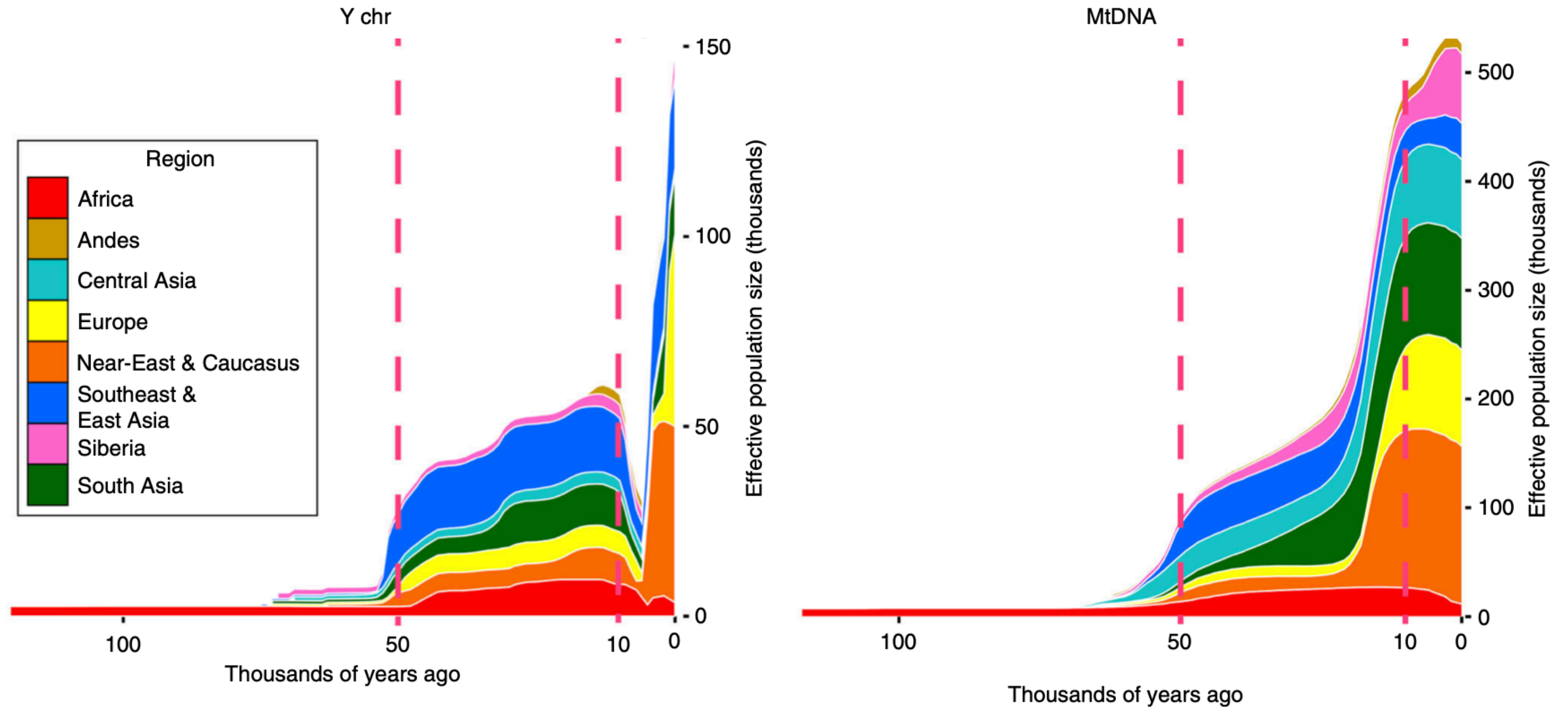


Fig. 1 Cumulative Bayesian skyline plots of Y-chromosome and mtDNA diversity by world regions. Reprinted from Karmin et al.⁴ with permission from Monika Karmin and under a Creative Commons License (Attribution-NonCommercial 4.0 International)

The Song of Everlasting Sorrow

姊妹弟兄皆列土，
可憐光彩生門戶。

All her sisters and brothers had royal demesnes granted.
Imperial but pitiful glory on the Yang family was bestowed.

遂令天下父母心，
不重生男重生女。

On the mindset of all parents her success was a strong influence.
Baby girls instead of baby boys became the popular preference.

- Tang Dynasty: An-Shi Rebellion
- Bai Juyi
 - Yang Guifei, Emperor Xuanzong, An Lushan, and Yang Guozhong
- The love of the Emperor was so strong as to upset the natural order, and so:
 - Baby girls instead of boys became the popular preference...
 - “In heaven we vow to fly wing to wing.
On earth we vow to tangle branch to branch
Heaven will fade, earth will fade
Our parting is everlasting sorrow.”



Lady Yang Guifei

Document: Abigail Smith Adams: Letter to John Adams

<https://tinyurl.com/dl20180226a>: Letter to John Adams 31 Mar-5 Apr 1776...

- Braintree March 31, 1776: I wish you would ever write me a Letter half as long as I write you; and tell me if you may:
 - Where your Fleet are gone?
 - What sort of Defence Virginia can make against our common Enemy?
 - Whether it is so situated as to make an able Defence?
 - Are not the Gentry Lords and the common people vassals?
 - Are they not like the uncivilized Natives Brittain represents us to be?
- I hope their Riffel Men who have shewen themselves very savage and even Blood thirsty; are not a specimen of the Generality of the people.



Catch Our Breath

Let's reflect on what we have just heard & seen...

1. Comments
2. Questions
3. Readings

