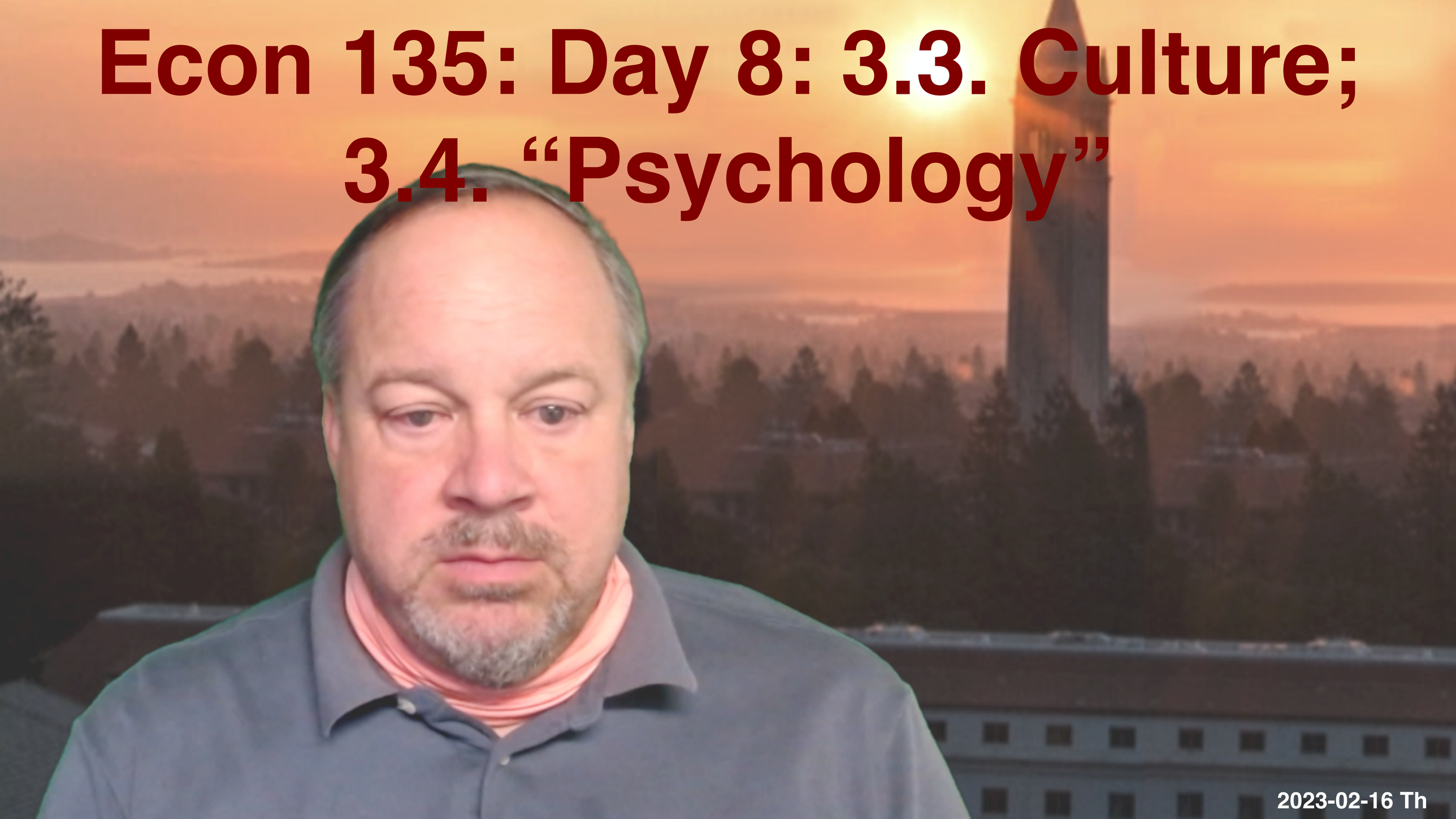
Econ 135: Day 8: 3.3. Culture; 3.4. “Psychology”



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Five Post-Agriculture Watersheds, & Grand Counterfactuals…

Date	Technological Ideas-Stock Growth Rate h	Technological Ideas Stock Level H (1870 = 1)	Average Annual Real Income per Capita y	Total Human Population P (millions)	Total Real World Income Y (billions)
-48000	0.002%	0.011	$1,200	0.2	$0.24
-8000	0.003%	0.036	$1,200	2	$2.4
-6000	0.009%	0.043	$900	5	$4.5
-3000	0.018%	0.074	$900	15	$14
-1000	0.030%	0.136	$900	50	$45
150	0.060%	0.272	$900	200	$180
800	0.014%	0.297	$900	240	$216
1500	0.052%	0.429	$900	500	$450
1770	0.149%	0.643	$1,100	750	$825
1870	0.442%	1.000	$1,300	1300	$1,690
2010	2.159%	20.557	$11,600	6900	$80,040

Writing, Late-Antiquity Pause, Commercial-Imperial, British Industrial, Modern Economic Growth

- Writing makes us a time-binding wide-ranging global anthology intelligence
- The Late-Antiquity Pause shows us that accelerating progress was not foreordained
- Commercial-Imperial breaking out of Malthusian stagnation
- British Industrial Revolution application of non-human power and automatic machinery
- Modern Economic Growth inventing the rationalization and routinization of invention and deployment: the industrial research lab, the modern corporation and its value chain, plus global reach via globalization

Counterfactual Permanent Agrarian-Age World

What if there had been no Commercial Revolution?

- What would we have to eliminate from our world?
- What things made a difference in bringing the Commercial-Imperial Revolution Age?
  - What were the key differences of the Renaissance-Reformation from previous "efflorescences"?
  - A tentative list:
    - The New World & the Columbian Exchange?
    - Merchant republics & constitutional monarchies?
    - Printing as transformative for intellectual life?
- How plausible is permanent Gunpowder-Empire world?
- Rate of ideas growth remains at 3.5%/century = 0.9%/generation
  - Ideas doubling time of 2000 years; population doubling time of 1000 years
  - World today of 1/10 population, $2.50/day
  - Population growing at glacial pace of 7%/century
  - Level of technology today = level of 1630…

Permanent Agrarian Scenario

Date	Human Population (millions)	Income per Capita (per year)	World Product (billions)		Population and Labor Force Growth n	Efficiency-of-Labor Growth g	Ideas-Stock Growth h
-48000	1	$1,200	$1				
-8000	3	$1,200	$4		0.003%	0.000%	0.001%
-3000	15	$900	$14		0.032%	-0.006%	0.010%
-1000	50	$900	$45		0.060%	0.000%	0.030%
150	200	$900	$180		0.121%	0.000%	0.060%
800	240	$900	$216		0.028%	0.000%	0.014%
1500	500	$900	$450		0.105%	0.000%	0.052%
1770	664	$900	$597		0.105%	0.000%	0.052%
1870	737	$900	$663		0.105%	0.000%	0.052%
2020	863	$900	$776		0.105%	0.000%	0.052%
2100	938	$900	$844		0.105%	0.000%	0.052%
2200	1042	$900	$938		0.105%	0.000%	0.052%

Counterfactual Permanent Gunpowder-Empire World

What if there had been no Industrial Revolution?

- What would we have to eliminate from our world?
- What things made a difference in bringing the Industrial Revolution Age?
  - British Empire & coal & scientific Enlightenment?
- How plausible is permanent Early Steampunk world?
- Rate of ideas growth remains at 15%/century = 4%/generation
  - Ideas doubling time of 500 years; population doubling time of 250 years
  - World in 2020 of 39% of our population, $3.25/day
  - Population growing at pace of 30%/century
  - Level of technology today = level of… there really isn't a great comparison—250 more years of Commercial-Imperial Age progress, but without the breakthrough to steam power (and probably without the breakthrough to machinery: labor just too cheap)

Gunpowder Empire Scenario

Date	Human Population (millions)	Income per Capita (per year)	World Product (billions)		Population and Labor Force Growth n	Efficiency-of-Labor Growth g	Ideas-Stock Growth h
-48000	1	$1,200	$1				
-8000	3	$1,200	$4		0.003%	0.000%	0.001%
-3000	15	$900	$14		0.032%	-0.006%	0.010%
-1000	50	$900	$45		0.060%	0.000%	0.030%
150	200	$900	$180		0.121%	0.000%	0.060%
800	240	$900	$216		0.028%	0.000%	0.014%
1500	500	$900	$450		0.105%	0.000%	0.052%
1770	748	$1,100	$823		0.149%	0.074%	0.149%
1870	893	$1,169	$1,044		0.176%	0.061%	0.149%
2020	1396	$1,169	$1,632		0.298%	0.000%	0.149%
2100	1772	$1,169	$2,071		0.298%	0.000%	0.149%
2200	2387	$1,169	$2,790		0.298%	0.000%	0.149%

Counterfactual Permanent Steampunk World

No Modern Economic Growth

- What would we have to eliminate from our world?
- What things made a difference in bringing about Modern Economic Growth?
  - Modern corporation & industrial research lab & STEM labor-force growth?
  - Globalization?
- How plausible is Steampunk World?
- Rate of ideas growth remains at 75%/ century…
  - Ideas doubling time of 120 years; population doubling time of 60 years
  - World in 2200 of 14 billion people:
  - World in 2200 of $4.75/day
  - Level of technology today = level of 1905
  - Level of technology in 2200 = level of 1945

Steampunk I Scenario

Date	Human Population (millions)	Income per Capita (per year)	World Product (billions)		Population and Labor Force Growth n	Efficiency-of-Labor Growth g	Ideas-Stock Growth h
-48000	1	$1,200	$1				
-8000	3	$1,200	$4		0.003%	0.000%	0.001%
-3000	15	$900	$14		0.032%	-0.006%	0.010%
-1000	50	$900	$45		0.060%	0.000%	0.030%
150	200	$900	$180		0.121%	0.000%	0.060%
800	240	$900	$216		0.028%	0.000%	0.014%
1500	500	$900	$450		0.105%	0.000%	0.052%
1770	748	$1,100	$823		0.149%	0.074%	0.149%
1870	1297	$1,300	$1,686		0.550%	0.167%	0.442%
2020	2872	$1,696	$4,870		0.530%	0.177%	0.442%
2100	5825	$1,696	$9,878		0.884%	0.000%	0.442%
2200	14103	$1,696	$23,914		0.884%	0.000%	0.442%

Counterfactual Permanent Scarce-Resource Steampunk World

No Modern Economic Growth

- What would we have to eliminate from our world?
- What things made a difference in bringing about Modern Economic Growth?
  - Modern corporation & industrial research lab & STEM labor-force growth?
  - Globalization?
- Fall in technological progress from its British Industrial Revolution pace
  - Back to 0.25%/year
- How plausible is Scarce-Resource Steampunk World?
- Rate of ideas growth remains at 29%/century…
  - Ideas doubling time of 280 years; population doubling time of 140 years
  - World in 2200 of 4 billion people:
  - World in 2200 of $4.75/day
  - Level of technology today = level of 1888
  - Level of technology in 2200 = level of 1915

Steampunk II Scenario

Date	Human Population (millions)	Income per Capita (per year)	World Product (billions)		Population and Labor Force Growth n	Efficiency-of-Labor Growth g	Ideas-Stock Growth h
-48000	1	$1,200	$1				
-8000	3	$1,200	$4		0.003%	0.000%	0.001%
-3000	15	$900	$14		0.032%	-0.006%	0.010%
-1000	50	$900	$45		0.060%	0.000%	0.030%
150	200	$900	$180		0.121%	0.000%	0.060%
800	240	$900	$216		0.028%	0.000%	0.014%
1500	500	$900	$450		0.105%	0.000%	0.052%
1770	748	$1,100	$823		0.149%	0.074%	0.149%
1870	1297	$1,300	$1,686		0.550%	0.167%	0.442%
2020	1614	$1,696	$2,737		0.146%	0.177%	0.250%
2100	2408	$1,696	$4,083		0.500%	0.000%	0.250%
2200	3970	$1,696	$6,731		0.500%	0.000%	0.250%

No Late-Antiquity Pause

No Shift to "Extractive" Institutions in Eurasia?

- What would we have to add to our world?
- Continued post-150 slow acceleration in technical progress
- Breakthrough to Imperial-Commercial Age pace around 800
- No fortuitous combination of high wages and really cheap coal in the Dover Circle—but somehow a breakthrough to Industrial-Revolution growth pace around 1500
- Modern Economic Growth arrives around 17
- Late demographic transition because of slowe acceleration gives us twice our current population
- Today sees average worldwide income-per-capita at $3000/year…

No Late-Antiquity Pause Scenario

Date	Human Population (millions)	Income per Capita (per year)	World Product (billions)		Population and Labor Force Growth n	Efficiency-of-Labor Growth g	Ideas-Stock Growth h
-48000	1	$1,200	$1				
-8000	3	$1,200	$4		0.003%	0.000%	0.001%
-3000	15	$900	$14		0.032%	-0.006%	0.010%
-1000	50	$900	$45		0.060%	0.000%	0.030%
150	200	$900	$180		0.121%	0.000%	0.060%
800	497	$1,094	$543		0.140%	0.030%	0.100%
1500	2629	$1,349	$3,547		0.238%	0.030%	0.149%
1770	9712	$2,316	$22,488		0.484%	0.200%	0.442%
1870	16336	$14,008	$228,835		0.520%	1.800%	2.060%
2020	16336	$307,858	$5,029,126		0.000%	2.060%	2.060%
2100	16336	$1,599,809	$26,134,239		0.000%	2.060%	2.060%
2200	16336	$12,552,053	$205,048,450		0.000%	2.060%	2.060%

Those Are Not the Worlds We Live in

Modern Economic Growth:

- We did have:
  - Industrial research lab: routinization & rationalization of invention & innovation
  - Modern corporation: routinization & rationalization of the deployment of ideas
  - Globalization
    - Transport
    - Communications
    - Migration
    - American ascendancy: "the furnace where the future is being forged"
- Ideas growth of 2.1%/yr
  - Doubling time of 35 years
  - More change in one year than in 50
- Enormous growth in global inequality

Date	Technological Ideas-Stock Growth Rate h	Technological Ideas Stock Level H (1870 = 1)	Average Annual Real Income per Capita y	Total Human Population P (millions)	Total Real World Income Y (billions)
-48000	0.002%	0.011	$1,200	0.2	$0.24
-8000	0.003%	0.036	$1,200	2	$2.4
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-3000	0.018%	0.074	$900	15	$14
-1000	0.030%	0.136	$900	50	$45
150	0.060%	0.272	$900	200	$180
800	0.014%	0.297	$900	240	$216
1500	0.052%	0.429	$900	500	$450
1770	0.149%	0.643	$1,100	750	$825
1870	0.442%	1.000	$1,300	1300	$1,690
2010	2.159%	20.557	$11,600	6900	$80,040

The Dover-Circle-Plus

Gross Global Inequality

- 3-to-1 ratio of society prosperity in the past
- 50-to-1 ratio today
- 1/10 of the world—the global north—at 4x the world average
- ⅛ of the world—the bottom billion—at $2.50/day, 1/12x the world average
- Median at $5000/year—$14/day

Date	Ideas Growth Rate h	Ideas Stock Level	Real Income/ Capita y	Popula-tion P (millions)	Total Income Y (billions)
-48000					
-8000	0.000%	0.036	$1,200	0.1	$0.12
-6000	0.003%	0.038	$900	0.2	$0.18
-3000	0.015%	0.060	$900	0.5	$0.45
-1000	0.035%	0.120	$900	2	$1.80
150	0.048%	0.207	$900	6	$5.40
800	0.022%	0.240	$900	8	$7.20
1500	0.096%	0.471	$1,000	25	$25.00
1770	0.200%	0.807	$1,400	75	$105.00
1870	0.914%	2.013	$2,800	175	$490.00
2010	2.514%	67.989	$50,000	800	$40,000.00

On a World Scale…

Key Shifts:

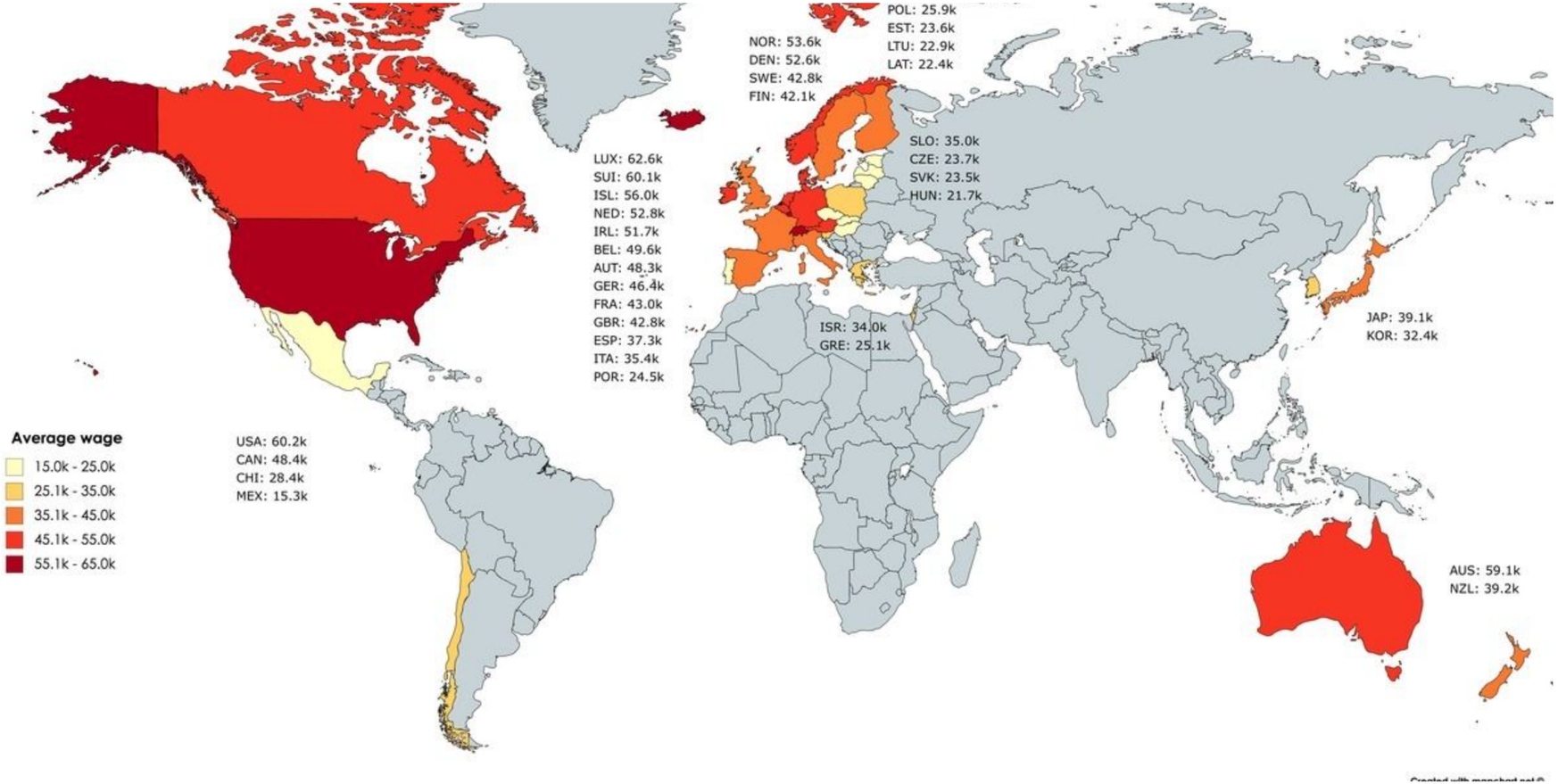
- 1500-1770:
  - First globalization
  - Columbian exchange
  - “Tinkering” society
  - Decentralized resource mobilization
- 1770-1870:
  - Applying stored sunlight by burning coal to make steam
  - Ingathering world manufacturing
  - “Inventive” society
- 1870-present:
  - Modern science
  - Industrial research lab
  - Modern corporation
  - Full globalization

Date	Ideas Growth Rate h	Ideas Stock Level H	Real Income/ Capita y	Popula-tion P (millions)	Total Income Y (billions)
1500	0.062%	0.467	$1,000	480	$480
1770	0.146%	0.694	$1,100	875	$963
1870	0.365%	1.000	$1,300	1300	$1,690
1930	1.793%	3.000	$3,000	2100	$6,300
1975	2.256%	9.000	$6,000	4000	$24,000
2020	2.282%	27.000	$12,000	7800	$93,600
2077	1.939%	81.000	$33,173	9311	$308,857
2100	1.939%	127.381	$50,000	10000	$500,000
2200	2.000%	941.227	$369.453	10000	$3.694.528

The Dover Circle—and Its Spread

Conquest, Settlement, Emulation…

- Plus resource engrossment: imperialism & neoimperialism
- 2.5% of the world's population in 800, 5% in 1500, 15% in 1870, 11% of the world's population today
- Leading edge vs. world as a whole: 1-1 in 1500, 1.1-1 in 1770, 2.1-1 in 1870, 4.5-1 today



Western European Society in 1500

Decaying Feudalism Plus:

- Its vicissitudes:
  - Manors: from jurisdiction-labor-landlords to landlords-farmers-laborers, with judges-as-referees
  - Nobles: from territorial lordships to scattered holdings
  - Obligations: from service to money
  - From holdings to affinities
  - Towns…
- Other layers
  - Germanic assemblies
  - Church
  - Kings—and the survivals of the Roman law tradition
  - Estates

Resources! The “New World”

The Columbian Exchange

- **Corn, the potato, chocolate, &c.:** substantial boost to calories
- Benefits everywhere!
- But one-sided: Europe gains empire and resources wherever its ships can sail and cannon can shoot
- Sugar islands and the slave trade
  - 400 calories per Briton per day by 1750?
  - The underdevelopment of Africa
    - 12.5 million Atlantic African slave trade
    - (2 million Mediterranean, 4 million Black Sea, 1 million Viking, 17 million Indian Ocean, 30 million Graeco-Roman)

Resources! “Globalization”

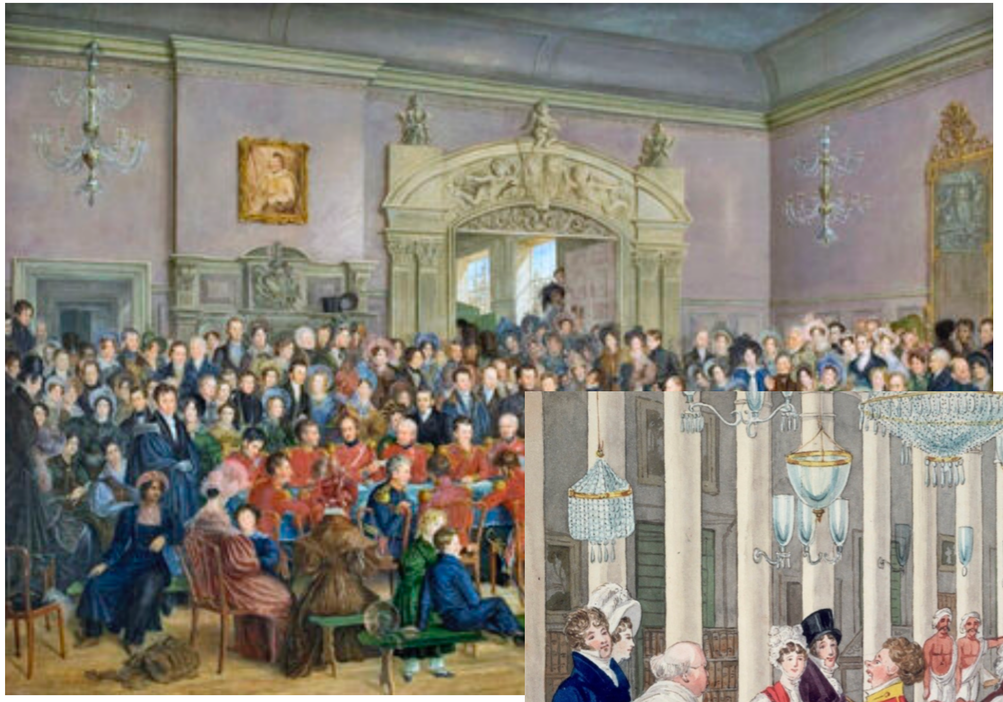
The East Indies

- **Spices—later silks, porcelain, cottons:** 80% fall in real price
- Benefits everywhere
  - But benefits one-sided: disassembling a mountain of silver in Peru in order to import luxuries from China, India, Malaysia, and Indonesia…

Political Economy!

Political Economy

- **The merchants of Bristol,**
- **The nabobs,**
- **The King of Spain:** New wealth to add in to the scales…
- To serve God, to win glory, and to grow rich—ideologists, soldiers, and merchants
- Inflation



If It Is Not Institutions, How About Culture & Psychology?

This is the argument of Clark, chapters 7-9:

- 7. Technological Advance
  - Why Was Technological Advance So Slow before 1800?: "Preindustrial societies differed from each other in every conceivable way socially and institutionally…"
  - "Yet… all… had one thing in common: the production technology improved very slowly…"
- 8. Institutions
  - Many societies had good-enough institutions…
  - Property, exchange, and contract are found frequently: "institutions as favorable to economic growth as any the current World Bank could wish for…"

- 9. "The Emergence of Modern Man"
  - People in 1800 in the Dover Circle were very different than people in 1200:
    - Interest rates: 10% -> 5%
    - Work-hours: Up to modern levels
    - Decline in interpersonal violence
    - *Bourgeois* virtues: "*Thrift, prudence, negotiation, and hard work were becoming values for communities that previously had been spendthrift, impulsive, violent, and leisure loving…*"

Slowness of Technological Advance

Pre-1800: significant over time, but agonizingly slow:

- No stirrups until 250 in China, 800 in Europe;
  - horse collar only in 750
  - "The Greeks and Romans also lacked windmills…Yorkshire, England, in 1185…
  - Buttons… Germany, 1230s…
  - Spinning wheels (France, by 1268),
  - Mechanical clocks (England, 1283),
  - Spectacles (Italy, 1285), f
  - Firearms (Spain, 1331),
  - Movable-type printing (Germany, 1453)…"
- "Preindustrial societies differed from each other in every conceivable way socially and institutionally…"
- "Yet… all… had one thing in common: the production technology improved very slowly… [with] periods of regression…"

- Many societies had good-enough institutions to provide incentives

Good-Enough Institutions All Over the Place

Clark, chapter 8: Adam Smith & the Market Economy

- Many societies had good-enough institutions…
- Property, exchange, and contract are found frequently…
- "While all societies before 1800 displayed slow rates of technological advance, some had institutions as favorable to economic growth as any the current World Bank could wish for…"
- Mediæval England: "Peasants or even laborers who were energetic and frugal could accumulate land and move up the rural social hierarchy…"
- "Institutions, as we shall see, often respond to economic circumstances rather than determine them. Societies with very low rates of technological innovation, such as those in most of the preindustrial world, would feel little need to establish institutions protecting the property rights of innovators…"

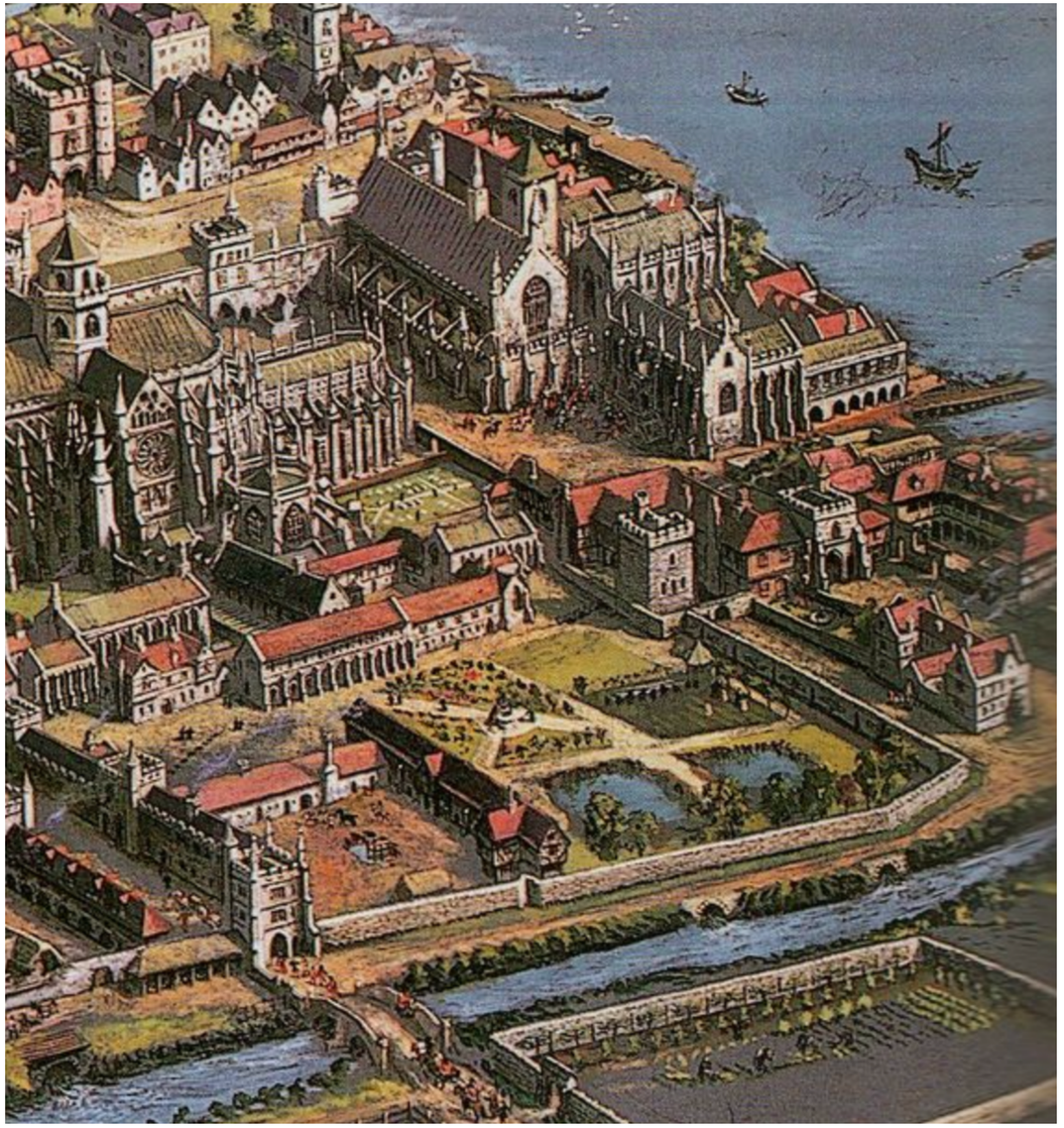
Table 8.1 The Incentives of Medieval versus Modern England

Economic desiderata	1300	2000
Low tax rates	Yes	No
Modest social transfers	Yes	No
Stable money	Yes	No
Low public debt	Yes	No
Security of property	Yes	Yes
Security of the person	?	Yes
Social mobility	Yes	Yes
Free goods markets	Yes	Yes
Free labor markets	Yes	Yes
Free capital markets	Yes	Yes
Free land markets	Yes	No
Rewards for knowledge creation	?	Yes

What Are “Institutions”?

Economists have a rather strange definition:

- Patterns of interaction—positive-sum, zero-sum, and negative-sum
- Good institutions:
  - Incentivize people to work hard at productive occupations
  - Provide people with tools to find counterparties
  - Provide people with tools to learn skills
  - Provide people with tools to, well, acquire tools with which they can produce



Rule of Law

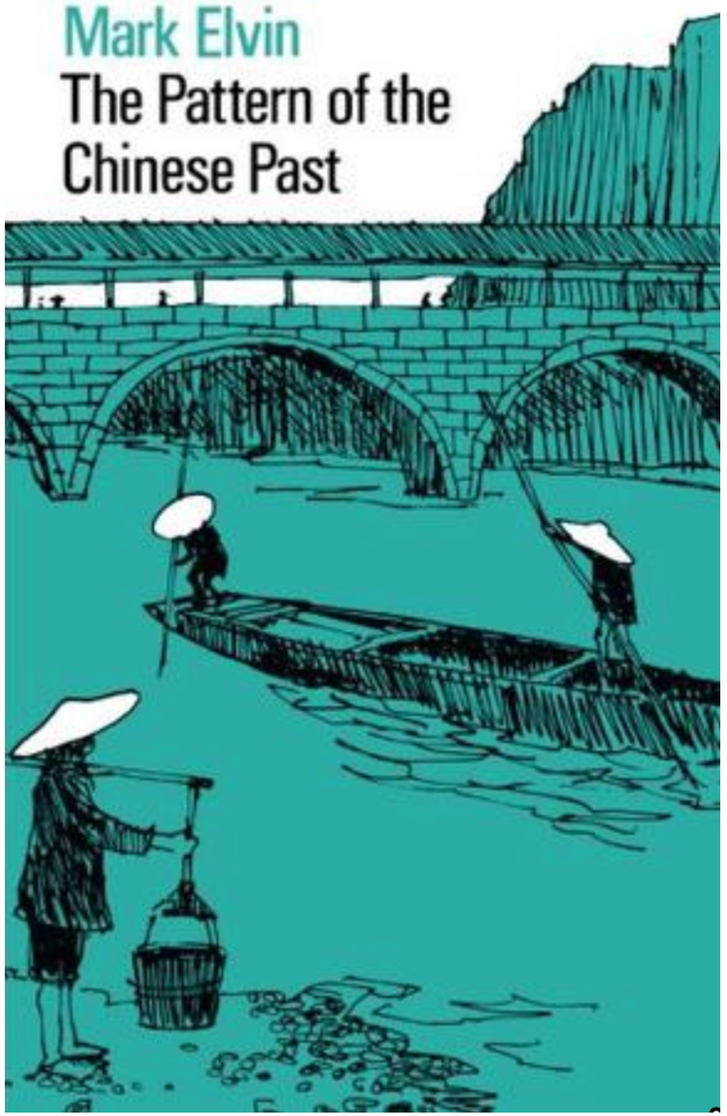
A government that is powerful, but weak:

- Establishes an order for use and control: property
- Establishes an order for free transfer under mutual agreement: contract
- Protects that property order against:
  - Bandits
  - Local notables
  - The government's own functionaries
- Does not revise that order at the whim of the powerful
- Does revise that order for general utility

But Property, Contract, & Commerce in Lots of Times & Places

China & the "High-Level Equilibrium Trap":

- Wang Shih-Mao's description of the Kiangsi porcelain-making center of Ching-te-Chen:
  - "Tens of thousands of pestles shake the ground with their noise. The heavens are awake with the glare from the fires, so that one cannot sleep at night. The place has been called in jest 'The Town of Year-Round Thunder and Lightning'…"
- Also in Kiangsi, water-driven hammers for husking rice:
  - "At important fords and in places where merchants gather… Over a hundred of the machines may be installed in the line of buildings to supply the grain boats which come and go selling rice…"
- In Fukien:
  - "Paddle wheels… are used to turn hammers for the manufacture of paper, so that 'the sound of pounding was like the whirr of wings'…"



But Good Institutions Are Much More than the Mere "Rule of Law"

Not just commerce, but distribution and invention:

- Incentivize people to work hard at productive occupations
- Incentivize people to save and invest
- Limit rent-seeking, and rent-sharing
- Provide people with tools to find counterparties
- Enable a fine and hence productive division of labor
- Provide people with tools to learn skills
- Provide people with the power to borrow and lend
- Provide people with the power to profit from new ideas
- Distribute wealth equitably
- Distribute social power equitably

The State and Economic Order

Comparative advantage is *dynamic*:

- Social and political institutions determine your niche
- "Leading sectors" to move to a better niche
  - Powers
  - Limits
  - Not "how much" but "what kind" of state intervention
- States on the continuum from predatory to developmental
  - Developmental states: taming elites via lowering risks of and creating incentives to engage in transformative investments

Specific Institution-Forming Moments

There are a lot of them:

- 700: The Catholic Church's war against cousin marriage—dissolving clan ties in favor of nuclear families, in the interest of making the principal allegiance that of a human soul to God mediated by the priest, rather than that of a clan member to the clan…
- 1070: Heinrich IV Salier at the Castle of Canossa: law binds even the most powerful, rather than being his tool…
- 1150: Urban charters…
- 1260: The end of landlord jurisdiction…
- 1380: The twilight of serfdom…
- 1450: Printing…
- 1530: The Reformation…
- 1540: The Dissolution of the Monasteries…
- 1689: The Glorious Revolution settlement…
- 1750: The slave trade-fueled power of the merchants of Bristol in the councils of the state…

Who Controls the State?: Wyatt's Rebellion

Queen Mary I Tudor's projected marriage to Felipe II Habsburg of Spain

- My great-12-grandfather Thomas Watt the Younger…
- Radicalized by diplomatic service in Spain
- 1554: the Queen should not marry a foreigner
- Agreed to take the lead in leading demonstrations and remonstrating with the queen—and assembling an army…
- Fails…
- Executed on Tower Hill on April 11, 1554
- Head hung from a gallows—and then stolen after 7 days
- Limbs "circulated to the towns"

J. Bradford DeLong and Andrei Shleifer (1993): Princes and Merchants: European City Growth Before the Industrial Revolution

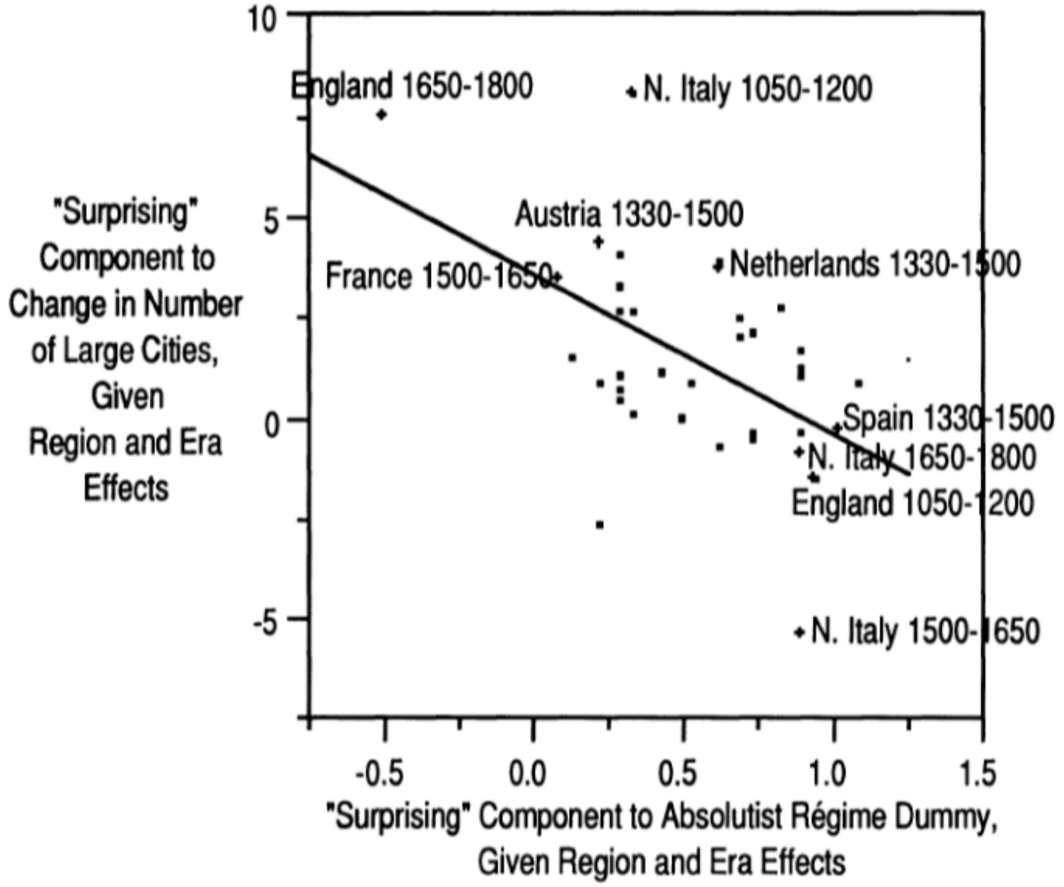


FIGURE 1.—Partial scatter of change in number of cities against absolutist regime

The total population living in western European cities of 30,000 or more in 1650 was 4.7 million. Had each of the nine regions experienced an additional century and a half of absolutist rule before 1650, this urban population would have been reduced by two million according to the regression in line 1 of Table 3. In such a scenario Europe in 1650 might well have played the same role in world history that it had played in 1000: a poor and barbarous backwater compared to the high civilizations of Islam, India, and China, rather than a continent on the verge of three centuries of world domination.

Conversely, had all of western Europe been free of absolutist rule over 1050–1650, then the regression in line 1 of Table 3 predicts that Europe in 1650 would have had a total urban population of nearly 8 million and would have had forty additional cities with more than 30,000 inhabitants. Such a heightened level of commerce and urban civilization might have triggered the Industrial Revolution considerably earlier.

Journal of Law & Economics 36, pp. 671-702. http://www.jstor.org/stable/725804

“The Emergence of Modern Man”

Culture & Psychology:

- -6000 to… Clark says 1800, but you do have three step-ups… 1500, 1770, 1870…
- People (and their cultures) were very different in 1800 than they had been in 1200
- People in 1800 (in the Dover Circle) were very different than people in 1200:
  - Interest rates: 10% -> 5%
  - Work-hours: Up to modern levels
  - Decline in interpersonal violence
  - *Bourgeois* virtues: “*Thrift, prudence, negotiation, and hard work were becoming values for communities that previously had been spendthrift, impulsive, violent, and leisure loving…*”

Rents & Patience

Figure 9.1 Return on land and on rent charges by decade in England, 1170–2003. For the years before 1350 the land returns are the moving average of three decades because in these early years this measure is noisy.

Literacy, Forethought, and Analysis

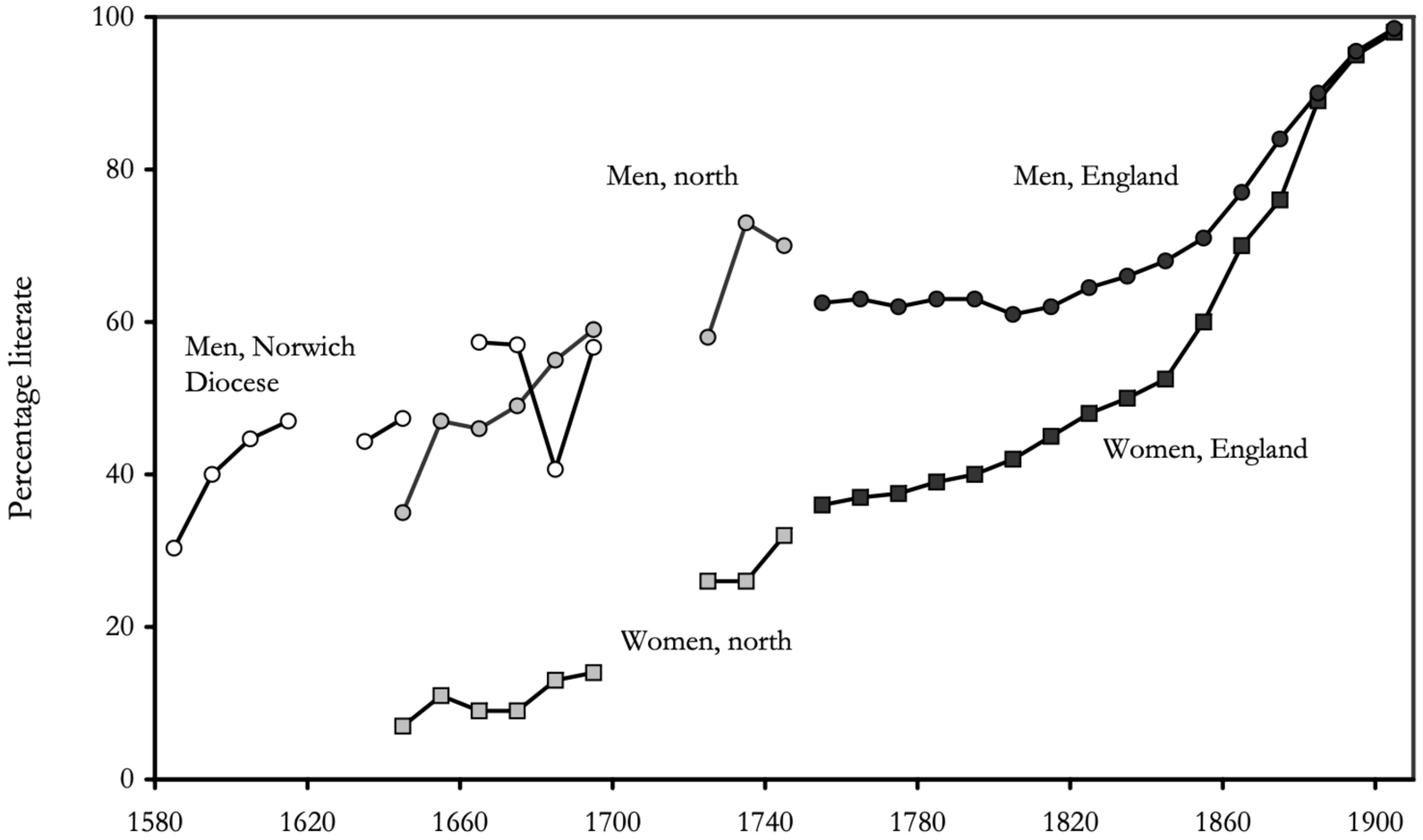


Figure 9.3 Literacy in England, 1580–1920. Data for 1750s–1920s from Schofield, 1973, men and women who sign marriage resisters; for the north, 1630s–1740s, from Houston, 1982, witnesses who sign court depositions; for Norwich Diocese, 1580s–1690s, from Cressy, 1980, witnesses who sign ecclesiastical court declarations.

Culture & Psychology

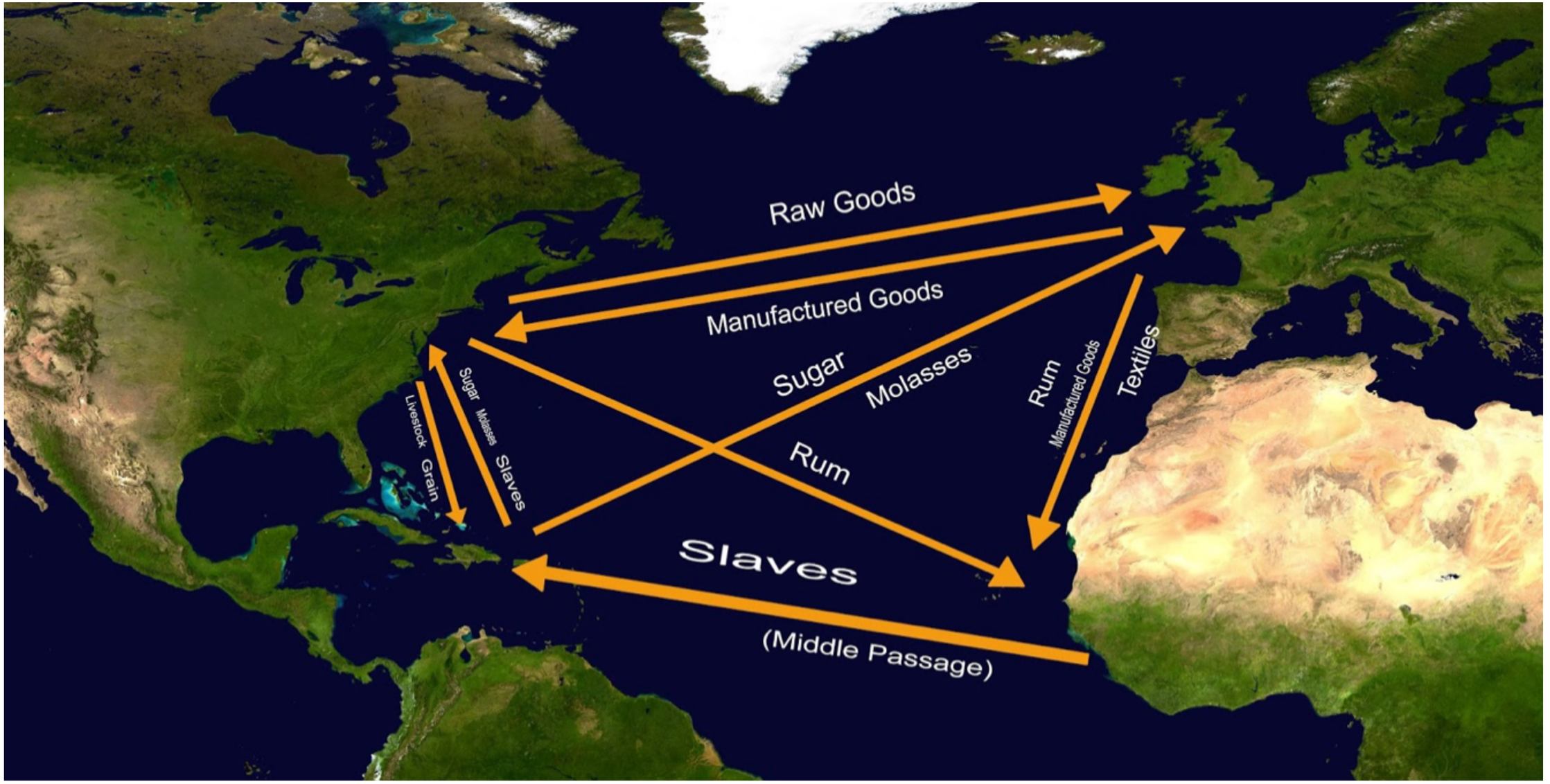
A great shift in the Dover Circle from 1200 to 1800:

- Interest rates: 10% -> 5%
- Literacy, forethought, and analysis
- Work-hours: Up to modern levels
- Decline in interpersonal violence
- *Bourgeois* virtues:
  - Spendthrift -> thrift,
  - Impulsion -> prudence,
  - Violence -> negotiation,
  - Leisure loving -> hard work

But Why Not Earlier?

Why do people in 1200 look the same as people in -8000, but people in 1800 look very different?:

The Africa-Caribbean-Europe Slave Trade



Slave Trades & Slavery…

Nathan Nunn (2008): *The Long-Term Effects of Africa's Slave Trades* <http://www.jstor.org/stable/pdfplus/25098896.pdf>

- "Classical" Antiquity (-700 to -100): 30M?
- Africa-Atlantic Ocean: 17M?
- Africa-Indian Ocean (1 to 1900): 15M?
- Africa-Internal: ????
- Black Sea: (1300-1700): 3M?
- Mediterranean (north-to-south) (800-1800): 2M?
- Scandinavian: (750-1100): 2M?

Nunn: Consequences of Rum, Guns, and Slaves

- From 8 to 6.5 in the natural log…
- exp(1.5) = 4.5
- Do we need controls?
- Or, rather, what controls do we need?
  - What else might be going on here

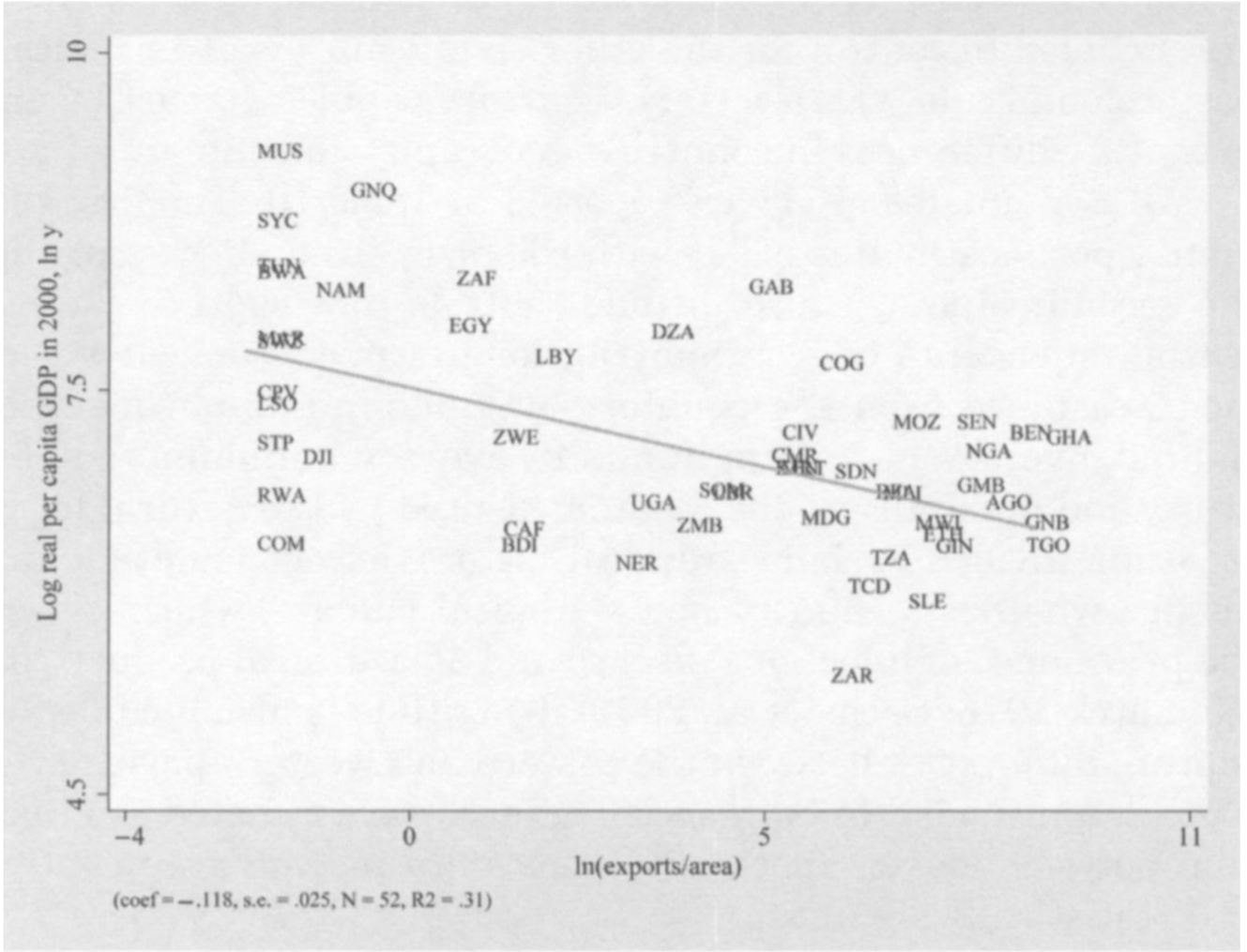


FIGURE III
Relationship between Log Slave Exports Normalized by Land Area, ln(exports/area), and Log Real Per Capita GDP in 2000, ln *y*

Nunn: Consequences of Rum, Guns, and Slaves

TABLE III
RELATIONSHIP BETWEEN SLAVE EXPORTS AND INCOME

	Dependent variable is log real per capita GDP in 2000, ln *y*					
	(1)	(2)	(3)	(4)	(5)	(6)
ln(exports/area)	−0.112***	−0.076***	−0.108***	−0.085**	−0.103***	−0.128***
	(0.024)	(0.029)	(0.037)	(0.035)	(0.034)	(0.034)
Distance from equator		0.016	−0.005	0.019	0.023	0.006
		(0.017)	(0.020)	(0.018)	(0.017)	(0.017)
Longitude		0.001	−0.007	−0.004	−0.004	−0.009
		(0.005)	(0.006)	(0.006)	(0.005)	(0.006)
Lowest monthly rainfall		−0.001	0.008	0.0001	−0.001	−0.002
		(0.007)	(0.008)	(0.007)	(0.006)	(0.008)
Avg max humidity		0.009	0.008	0.009	0.015	0.013
		(0.012)	(0.012)	(0.012)	(0.011)	(0.010)
Avg min temperature		−0.019	−0.039	−0.005	−0.015	−0.037
		(0.028)	(0.028)	(0.027)	(0.026)	(0.025)
ln(coastline/area)		0.085**	0.092**	0.095**	0.082**	0.083**
		(0.039)	(0.042)	(0.042)	(0.040)	(0.037)
Island indicator				−0.398	−0.150	
				(0.529)	(0.516)	
Percent Islamic				−0.008***	−0.006*	−0.003
				(0.003)	(0.003)	(0.003)
French legal origin				0.755	0.643	−0.141
				(0.503)	(0.470)	(0.734)
North Africa indicator				0.382	−0.304	
				(0.484)	(0.517)	
ln(gold prod/pop)					0.011	0.014
					(0.017)	(0.015)
ln(oil prod/pop)					0.078***	0.088***
					(0.027)	(0.025)
ln(diamond prod/pop)					−0.039	−0.048
					(0.043)	(0.041)
Colonizer fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number obs.	52	52	42	52	52	42
R^2	.51	.60	.63	.71	.77	.80

Notes. OLS estimates of (1) are reported. The dependent variable is the natural log of real per capita GDP in 2000, ln *y*. The slave export variable ln(exports/area) is the natural log of the total number of slaves exported from each country between 1400 and 1900 in the four slave trades normalized by land area. The colonizer fixed effects are indicator variables for the identity of the colonizer at the time of independence. Coefficients are reported with standard errors in brackets. ***, **, and * indicate significance at the 1%, 5%, and 10% levels.

TABLE IV
ESTIMATES OF THE RELATIONSHIP BETWEEN SLAVE EXPORTS AND INCOME

	(1)	(2)	(3)	(4)
Second Stage. Dependent variable is log income in 2000, ln *y*				
ln(exports/area)	−0.208***	−0.201***	−0.286*	−0.248***
	(0.053)	(0.047)	(0.153)	(0.071)
	[−0.51, −0.14]	[−0.42, −0.13]	[−∞, +∞]	[−0.62, −0.12]
Colonizer fixed effects	No	Yes	Yes	Yes
Geography controls	No	No	Yes	Yes
Restricted sample	No	No	No	Yes
F-stat	15.4	4.32	1.73	2.17
Number of obs.	52	52	52	42
First Stage. Dependent variable is slave exports, ln(exports/area)				
Atlantic distance	−1.31***	−1.74***	−1.32*	−1.69**
	(0.357)	(0.425)	(0.761)	(0.680)
Indian distance	−1.10***	−1.43***	−1.08	−1.57*
	(0.380)	(0.531)	(0.697)	(0.801)
Saharan distance	−2.43***	−3.00***	−1.14	−4.08**
	(0.823)	(1.05)	(1.59)	(1.55)
Red Sea distance	−0.002	−0.152	−1.22	2.13
	(0.710)	(0.813)	(1.82)	(2.40)
F-stat	4.55	2.38	1.82	4.01
Colonizer fixed effects	No	Yes	Yes	Yes
Geography controls	No	No	Yes	Yes
Restricted sample	No	No	No	Yes
Hausman test (*p*-value)	.02	.01	.02	.04
Sargan test (*p*-value)	.18	.30	.65	.51

Notes. IV estimates of (1) are reported. Slave exports ln(exports/area) is the natural log of the total number of slaves exported from each country between 1400 and 1900 in the four slave trades normalized by land area. The colonizer fixed effects are indicator variables for the identity of the colonizer at the time of independence. Coefficients are reported, with standard errors in brackets. For the endogenous variable ln(exports/area), I also report 95% confidence regions based on Moreira's (2003) conditional likelihood ratio (CLR) approach. These are reported in square brackets. The *p*-value of the Hausman test is for the Wu–Hausman chi-squared test. ***, **, and * indicate significance at the 1%, 5%, and 10% levels. The "restricted sample" excludes island and North African countries. The "geography controls" are distance from equator, longitude, lowest monthly rainfall, avg max humidity, avg min temperature, and ln(coastline/area).

- What are our instruments?
  - What is our first stage?
  - Is this a "weak instrument"?
    - Is F < 10?
  - Under what circumstances is an instrument that looks strong "weak"?
- Do we need channels?
- What are our channels?
- What would a Bayesian say about the publication filter and the file-drawer problem?

Weak Instruments...

Consider the simplest classical homoskedastic IV model:

$$y_t = \beta x_t + u_t$$
$$x_t = Z_t \pi + v_t,$$

Not relevant instrument. Imagine a situation when one has 1 endogenous regressor and 1 instrument which is independent of everything (totally irrelevant, $\pi = 0$). That is, the instrument is not valid and β is not identified. The question is how $\hat{\beta}_{TSLS}$ behaves? This should explain what we see in Bounder, Jaeger, Baker's (1995) "random quarter of birth" exercise:

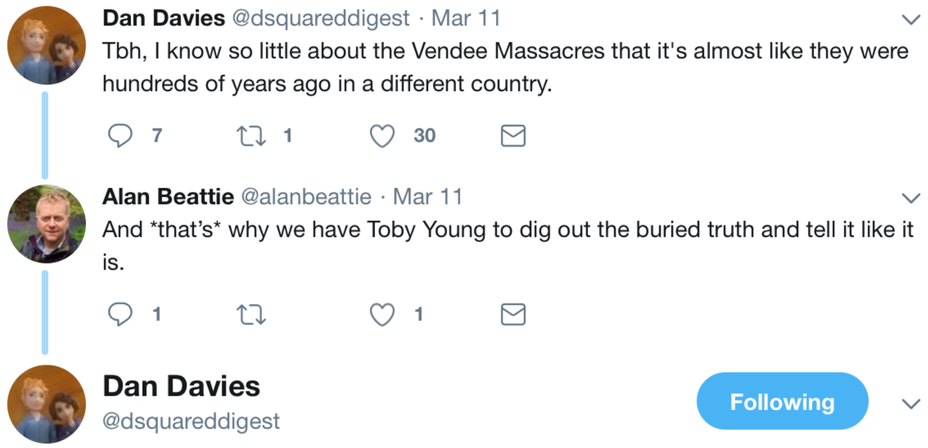
$$\hat{\beta}_{TSLS} - \beta_0 = \frac{\sum Z_t u_t}{\sum Z_t v_t} = \frac{\frac{1}{\sqrt{T}} \sum Z_t u_t}{\frac{1}{\sqrt{T}} \sum Z_t v_t} \Rightarrow \frac{\xi_u}{\xi_v},$$

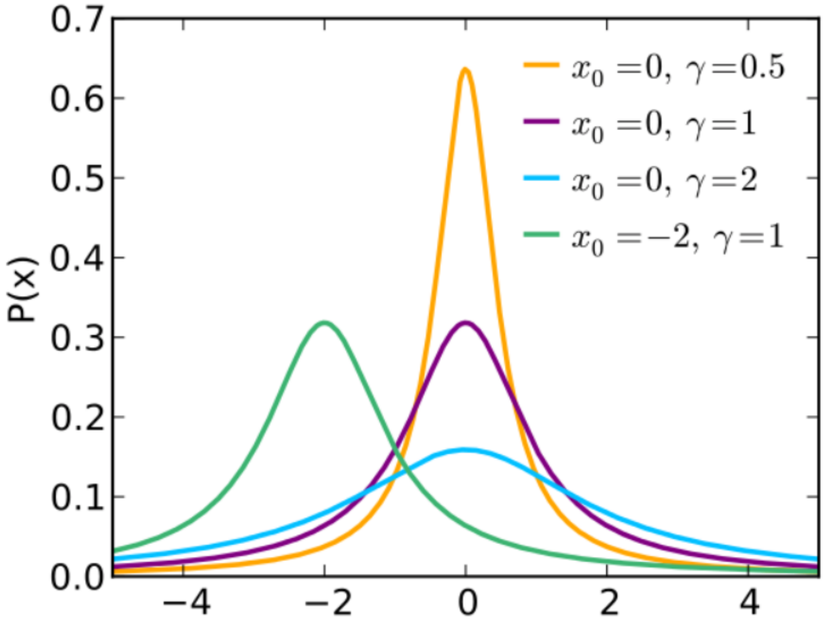
where $(\xi_u, \xi_v)' \sim N(0, \Sigma)$, $\Sigma = \begin{pmatrix} \sigma_u^2 & \sigma_{uv} \\ \sigma_{uv} & \sigma_v^2 \end{pmatrix}$. Let $\delta = \sigma_{uv}/\sigma_v^2$, then $\xi_u = \delta \xi_v + \xi$, and $\hat{\beta}_{TSLS} - \beta_0 \Rightarrow \delta + \frac{\xi}{\xi_v}$.

Conclusions:

- $\hat{\beta}_{TSLS}$ is inconsistent (as expected, since β is not identified).
- $\hat{\beta}_{TSLS}$ is centered around $\beta_0 + \delta$ (since $\frac{\xi}{\xi_v}$ has symmetric distribution), which is the limit of OLS.
- Asymptotically $\hat{\beta}_{TSLS}$ has heavy tails (since $\frac{\xi}{\xi_v}$ has Cauchy distribution)

The Cauchy Distribution





$$f(x;0,1) = \frac{1}{\pi(1+x^2)}$$

The Cauchy distribution has the probability density function (PDF)[1][4]

$$f(x;x_0,\gamma) = \frac{1}{\pi\gamma\left[1+\left(\frac{x-x_0}{\gamma}\right)^2\right]} = \frac{1}{\pi\gamma}\left[\frac{\gamma^2}{(x-x_0)^2+\gamma^2}\right]$$

- The Cauchy distribution is:
  - the distribution of the x-intercept of a ray issuing from (x_o, γ) with a uniformly distributed angle.
  - the distribution of the quotient of two independent normals when the denominator normal is mean zero.
  - γ = half the interquartile range = "probable error"
- Characteristics of the Cauchy:
  - Mean: undefined
  - Variance: undefined
  - MGF: does not exist
  - Skewness: undefined

What Happened with Decolonization?

Reading: This paper seems to me to bury the lead—which is that it is the interaction of past slave-raiding and present decolonization that seems to be associated with very low present-day economic productivity.

What are the mechanisms that could generate such an association?

Margherita Bottero & Björn Wallace: Is There a Long-Term Effect of Africa's Slave Trades?: 'Nunn (2008) found a negative relationship between past slave exports and economic performance within Africa. Here we investigate these findings and the suggested causal pathway in further detail. Extending the sample period back in time we reveal that the coefficient on slave exports did not become significantly negative until 1970, and that it was close to zero in 1960. While one potential explanation for this temporal pattern could be decolonization, we analyse other episodes of slave raiding outside Africa, and find evidence that questions the validity of such suggestion. In addition, our reading of the historical and anthropological literature differs from that of Nunn. For instance, taking a global rather than African perspective we find that the African slave trades cannot without difficulties explain the patterns of ethnic fractionalization that we observe today…

Memo: Why Has Pacific Rim Growth Been so Fast since 1950?

An absence of landlords; a presence of semi-honest bureaucracy:

- An agreement on common natural purpose
  - Previous land reform helps a lot…
- An agreed-on image of the future
  - It is not hard to see what is to be done, or how it is to be done, or that it will turn out to be profitable
- Resource mobilization
  - Successful bureaucratic organizational tradition helps a lot…
- Investment in things and people
  - Valuing education helps a lot…
- "Industrial Policy" concerns:
  - Communities of engineering practice
  - Selecting and supporting productive rather than unproductive firms
  - An undervalued exchange rate and global-north markets open to your exports may well be the best of all industrial policies
  - Use of foreign exchange to invest for the future rather than boost elite consumption in the present
- Amazing thing about poat-1978 China is that it did this while suspended in mid-air—without the market-economy underpinnings already in place