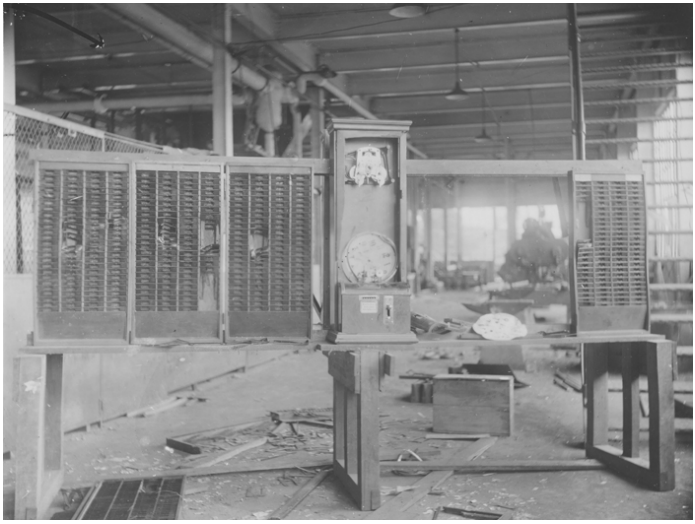
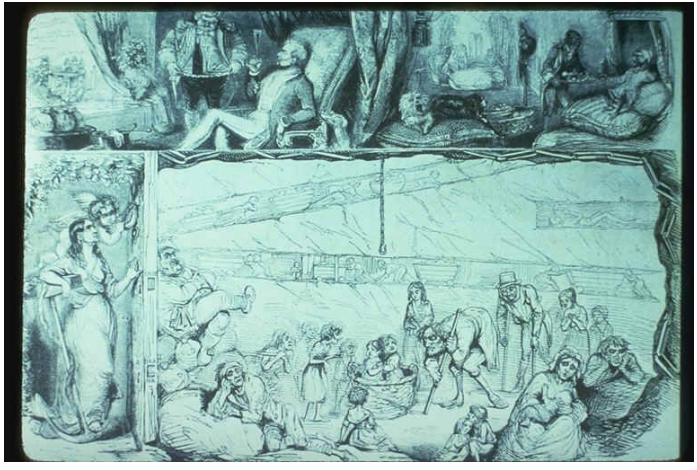
Winners and Losers of the Industrial Revolution



The Benefits of the Industrial Revolution

- How were the benefits of the Industrial Revolution distributed?
- Did some groups benefit at the expense of others?
- Which factors of production became more important and which became less important?
- Was the Industrial Revolution the triumph of greedy capitalists at the expense of workers?

A Pessimistic View of the Industrial Revolution



A Pessimistic View of the Industrial Revolution

A Pessimistic View of the Industrial Revolution

HISTORY REPEATS ITSELF.—THE ROBBER BARONS OF THE MIDDLE AGES, AND THE ROBBER BARONS OF TO-DAY.

How do we determine who gained from the Industrial Revolution?

- We know that the big difference between the modern economy and the preindustrial world is sustained efficiency advances
- If more output is produced per unit of capital, labor and land, then payments to these factors must increase
- Brings us to a slight twist on our growth accounting equations:

$$g_A = ag_r + bg_w + cg_s$$

Land Rents

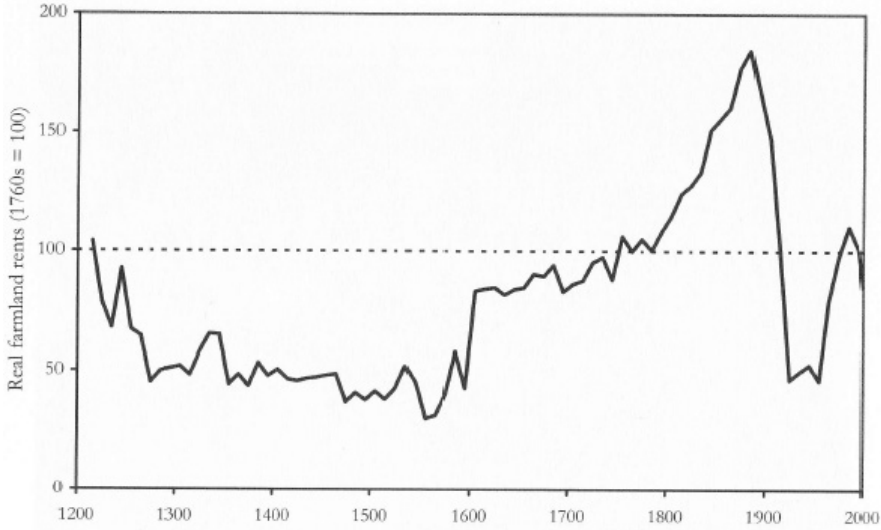


Figure 14.2 Real farmland rents per acre in England, 1210–2000.

What about urban land?

Modern Land Rents

Listing	Type	Land	Price per acre
Midtown Manhattan	Parking Lot	.22 acres	$21,894,500
Tuscarawas, OH	Pasture/Dairy	140 acres	$5,000
Dawson, MT	Farmland	480 acres	$700

What about urban land?

What about other natural resources?

What about other natural resources?

- 7.08 billion barrels of petroleum products were consumed in the US in 2015 (www.eia.gov)
- Crude oil averaged $49 a barrel in 2015 (www.weia.gov)
- US GDP was $17,947 billion in 2015 (www.bea.gov)
- So oil consumption represented roughly 1.9 percent of GDP

Land Rents

- So the owners of land don't seem to be the big gainers from the Industrial Revolution
- Farmland rents aren't any higher in real terms than they were before the Industrial Revolution
- Urban rents have risen quite a bit but still only represent a small fraction of the total share of income in modern economies
- So we could think of our accounting formula as being reduced to:

$$g_A \approx a g_r + b g_w$$

Returns to Physical Capital

- The rental rate of capital is just the real interest rate
- We've already seen that modern interest rates are lower than preindustrial interest rates
- So if anything, the growth in g_r has been close to zero or even negative
- However, payments to capital have expanded tremendously since the Industrial Revolution (just think of all those new factories)
- The increase in payments has been a result of the expansion of capital stock, not the return to a unit of capital

Returns to Physical Capital

554 SEARS, ROEBUCK & CO., CHICAGO,

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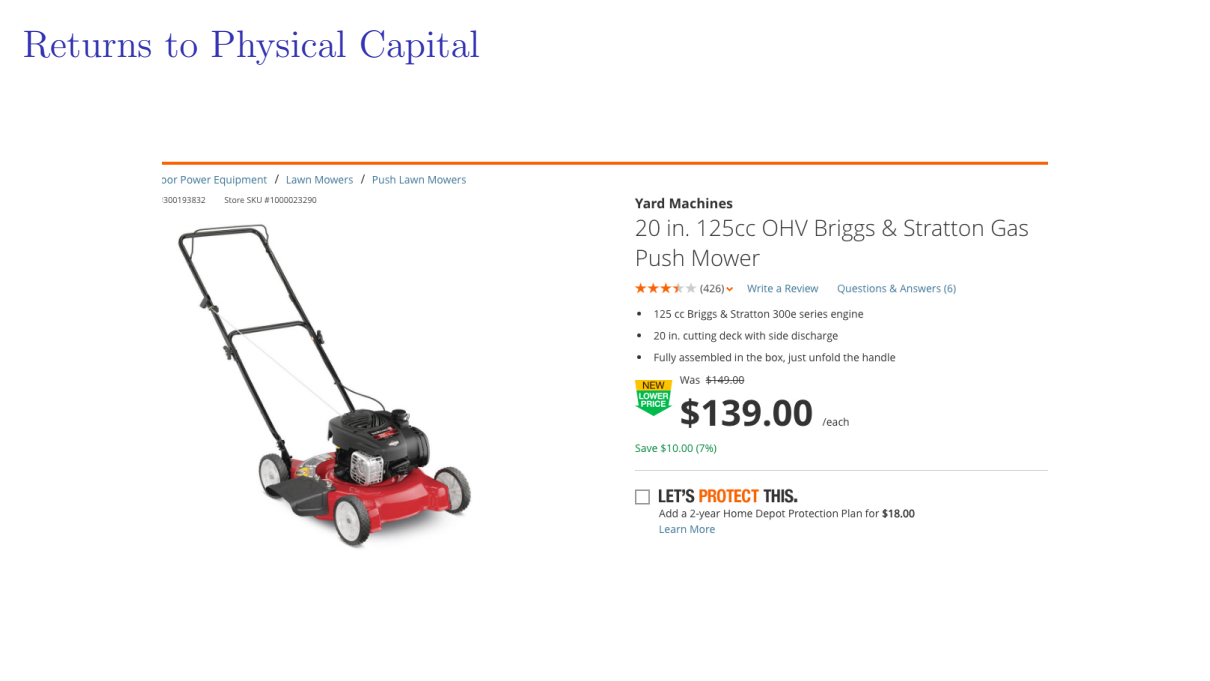
Catalogue Number	Horse Power	Size of Cylinder, inches	Diameter of Shaft, inches	Size of Fly Wheel, inches	Size of Belt Pulley, inches	Steam Pipe, inches	Exhaust Pipe, inches	Revolutions, Per Minute	Weight in Pounds	Price
32K4801	1½	2½x3½	1¼	13x3½	6x3½	¾	¾	400	270	$ 47.25
32K4802	2	3 x4½	1¼	16x4½	10x4½	¾	¾	350	325	59.50
32K4803	3	3½x4½	1½	16x4½	10x4½	¾	¾	350	350	65.75
32K4804	4	4 x5	1½	17x4½	12x4½	1	1	325	500	75.00
32K4805	6	5 x6½	2	20x8	14x8½	1¼	1¼	250	750	99.50
32K4808	8	6 x8	2½	24x8	16x7	1½	1½	200	1250	116.75
32K4810	10	7 x8	2½	26x8¾	18x8	1½	2	200	1500	130.00

3 HP for approximately $1,750 2015 USD

Returns to Physical Capital



Returns to Physical Capital

The Model 60...has a 60-megabyte, half-height hard disk...It costs $7,499...The 130-Mb drive actually stores and retrieves data faster than its smaller sibling, thanks to a special memory controller device that comes with the Models 130 and 300. Yes, 300. The monster comes with a fixed disk that can hold more than 300 million characters of data...It costs $12,499. – New York Times, January 10, 1988

Returns to Physical Capital

Roll over image to zoom in

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Returns to Physical Capital

- So the size of the capital stock is massive and a reasonably large share of payments go to capital
- But big values for g_K or a don't really matter for dividing up the gains from g_A
- What really matters is g_r
- If g_r is approximately zero, our accounting formula is further reduced to:

$$g_A \approx b g_w$$

- Note that this is not saying that there aren't rich owners of capital

Wages Over Time

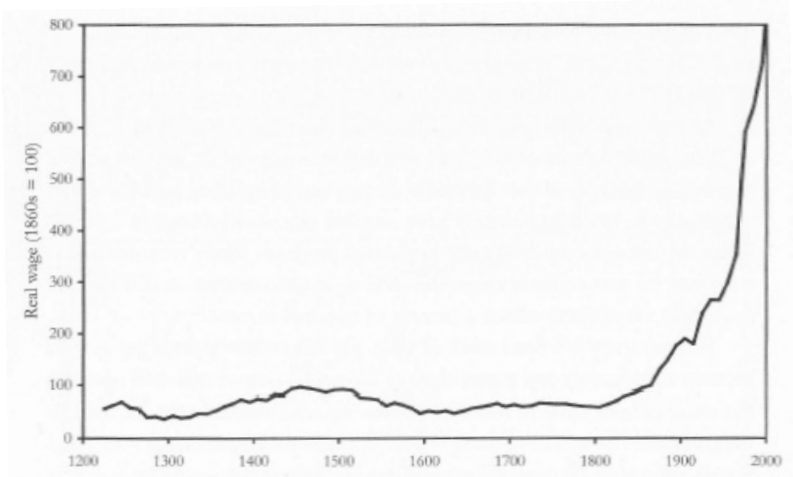


Figure 14.3 Real hourly wages for building laborers in England, 1220–2000. Data from Clark, 2005.

How much does an improvement in technology increase wages?

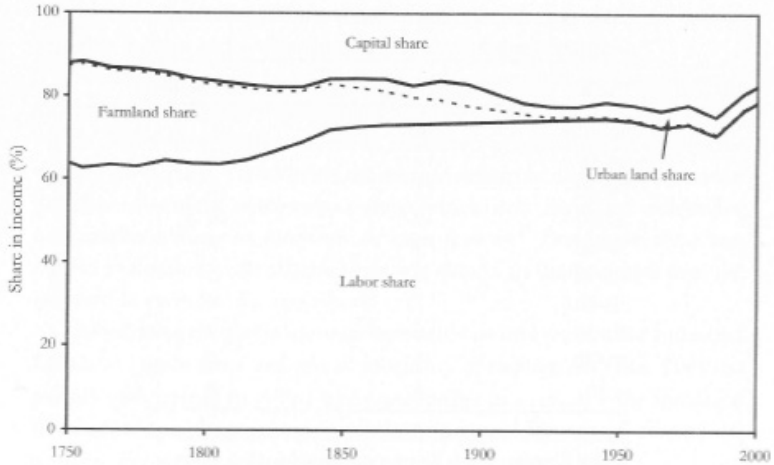


Figure 14.4 Shares of labor, capital, and land in net national income in England, 1750–2000. The urban and farmland shares were derived as in figure 10.3.

How much does an improvement in technology increase wages?

- The previous figures shows that roughly 75% of national income in England goes to labor
- If $g_A \approx b g_w$, then the growth in wages resulting from technological advance will be $\frac{4}{3} g_A$
- A one percent increase in efficiency produces an increase in average wages of 1.3 percent
- This doesn't tell us which types of workers were benefiting the most

The Modern Distribution of Wages and Wealth

Distribution of Wages and Wealth, United Kingdom, 2003-04

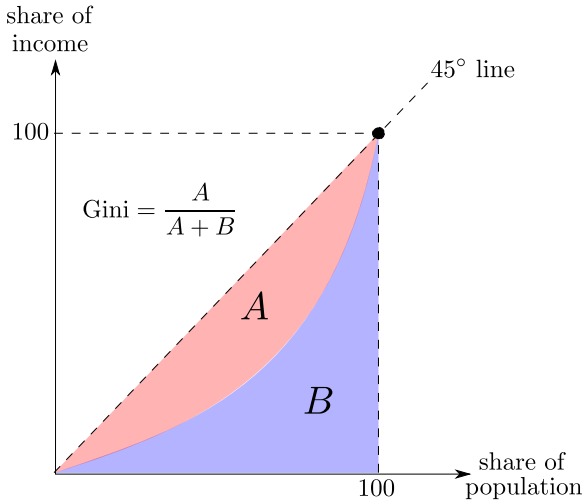
Decile	Share of wages	Share of wealth
90-100	26	45
80-90	14	16
70-80	12	10
60-70	10	10
50-60	9	8
40-50	8	5
30-40	7	4
20-30	6	2
10-20	5	0
0-10	4	0

The Preindustrial Distribution of Wealth

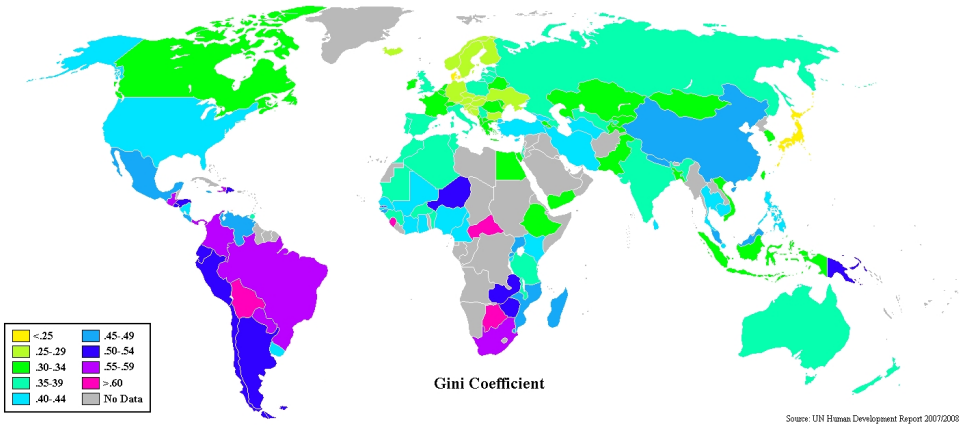
Preindustrial Wealth Distributions

Location	Year	Top 1%	Top 5%
Perugia	1285	18	29
Paris	1292	26	52
London	1319	34	57
Florence	1427	27	67
England	1670	49	73
England	1740	44	74
England	1875	61	74
United Kingdom	2003	17	32

The Distribution of Income



The Distribution of Income



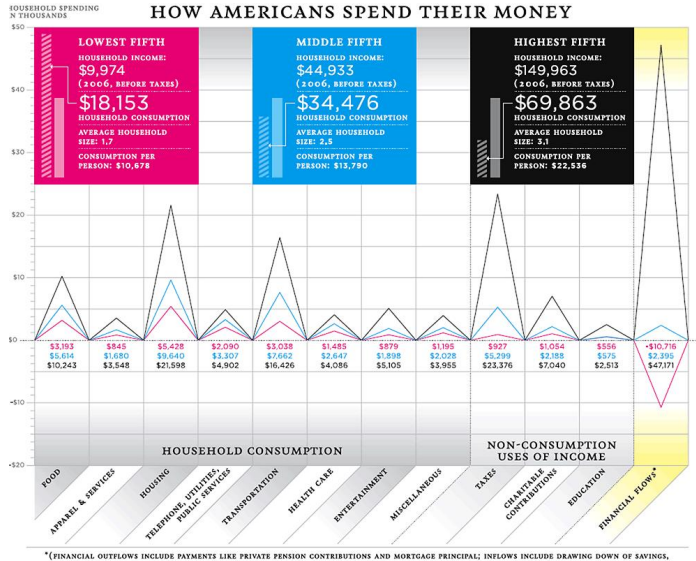
Gini coefficient for Byzantium (1000): .45, Gini coefficient for medieval France (1300): 0.7

Skill, Gender and Wages

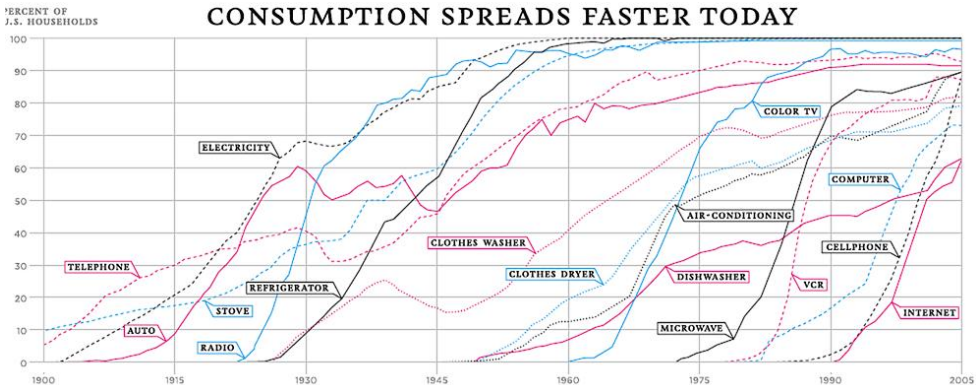
Income by skill and gender, England

	1770s	1850s	2004
Annual wage, unskilled men	15.40	27.20	16,898
Annual wage, unskilled women	6.90	12.30	12,516
Female to male wage ratio	0.45	0.45	0.74
Average adult wage	22.00	40.00	23,452
Unskilled to average wage ratio	0.51	0.49	0.63

What about consumption (rather than income or wealth)?



What about consumption (rather than income or wealth)?



What about other measures of well being?

Life Prospects of the Rich and Poor in England

Group	Stature (cm)	Life expectancy	Surviving children	Literacy
Preindustrial				
Rich	174	39	3.85	85
Poor	168.5	33	1.93	30
Difference	3%	18%	99%	183%
Modern				
Rich	178.2	80.8	1.33	100
Poor	176	74.3	1.64	88
Difference	1%	9%	-19%	14%

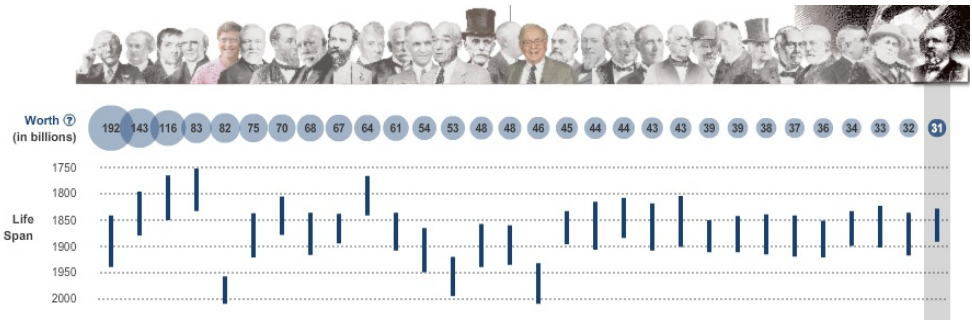
The Industrial Revolution and Inequality

- So it seems that wealth and income inequality are lower now than in preindustrial times
- Inequality between unskilled and skilled wages is lower
- Inequality between male and female wages is lower
- Inequality in life prospects is much lower
- Why didn't all of the pessimistic predictions materialize?

The Industrial Revolution and Inequality

- Labor income has become a bigger share of total income
- Land (which can be very unequally distributed) has declined in importance
- Movement away from brute strength to dexterity in production helped narrow male-female wage gap
- It turns out that machines did not make unskilled labor completely obsolete (machines are bad at interacting with people, identifying and manipulating physical objects in complicated ways)
- So where are the fat cats?

The Industrial Revolution and Inequality



http://www.nytimes.com/ref/business/20070715_GILDED_GRAPHIC.html

The Industrial Revolution and Inequality

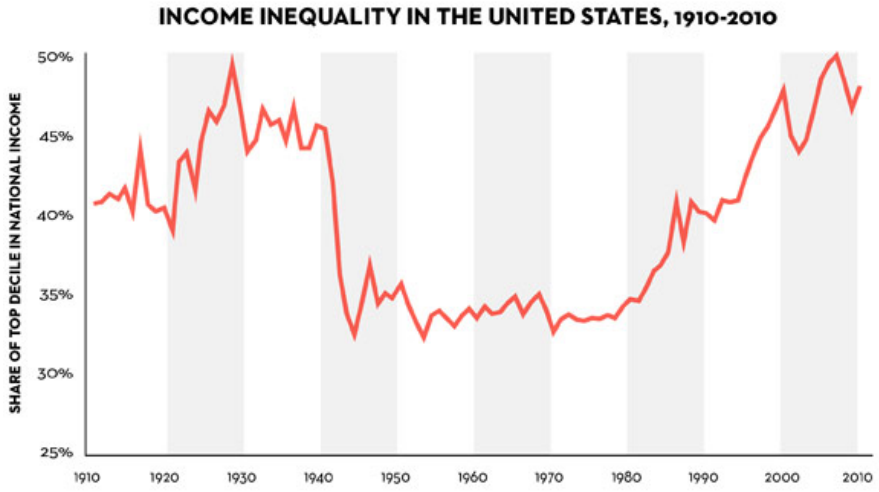
The Ten Wealthiest Americans

Rank	Name	Wealth	Lifetime	Industry
1	John D. Rockefeller	$192 billion	1839-1937	Standard Oil
2	Commodore Cornelius Vanderbilt	$143 billion	1794-1877	steamboats and railroads
3	John Jacob Astor	$116 billion	1763-1848	fur trader, NYC real estate
4	Stephen Girard	$83 billion	1750-1831	shipping
5	Bill Gates	$82 billion	1955-	Microsoft
6	Andrew Carnegie	$75 billion	1835-1919	steel
7	A.T. Stewart	$70 billion	1803-1876	department stores
8	Frederick Weyerhaeuser	$68 billion	1834-1914	lumber
9	Jay Gould	$67 billion	1836-1892	railroad, "Mephistopheles of Wall Street"
10	Stephen Van Rensselaer	$64 billion	1764-1839	patroon (aristocrat granted land by the Dutch)

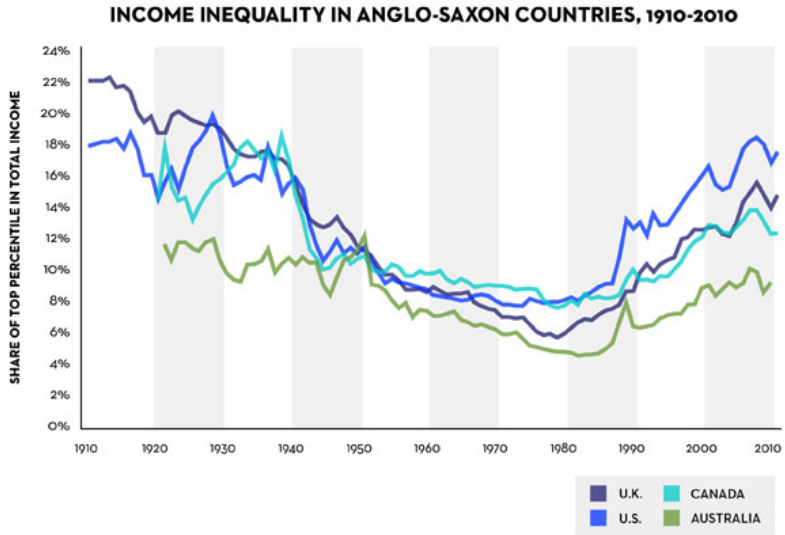
The Industrial Revolution and Inequality

"JIU-JITSUED"

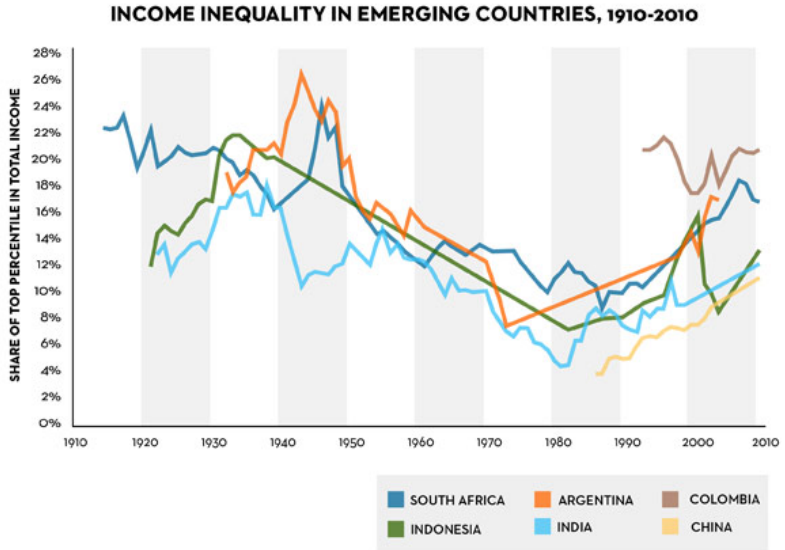
Within-Country Inequality Over Time



Within-Country Inequality Over Time



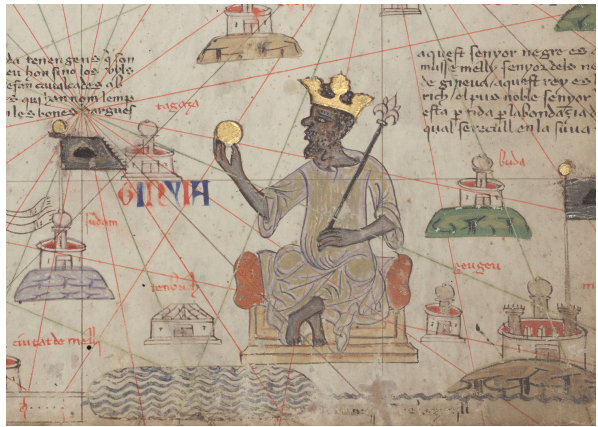
Within-Country Inequality Over Time



The Industrial Revolution and Inequality

Augustus Caesar, 63 BC - 14 AD, personal wealth equal to one fifth of Roman Empire

The Industrial Revolution and Inequality

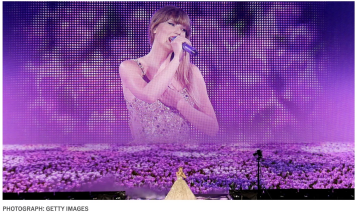


Mansa Musa, 1280 - 1337, king of Timbuktu, more gold than you could imagine

The Industrial Revolution and Inequality

Can superstars like Beyoncé or Taylor Swift spur inflation?

Some economists think that tours by big acts drive up the consumer-price index



PHOTOGRAPH: GETTY IMAGES

Beyoncé blamed for inflation surprise in Sweden

14 June 2023

Share

By Natalie Sherman, Business reporter, New York

The Industrial Revolution and Inequality

U.S. Presidents by Net Worth

President	Peak Net Worth (millions of 2022 $)	Years in Office	Lifespan
Donald Trump	7,000	2017–2021	born 1946
George Washington	707	1789–1797	1732–1799
Thomas Jefferson	284	1801–1809	1743–1826
Theodore Roosevelt	168	1901–1909	1858–1919
Andrew Jackson	159	1829–1837	1767–1845
James Madison	136	1809–1817	1751–1836
Lyndon B. Johnson	131	1963–1969	1908–1973
Herbert Hoover	100	1929–1933	1874–1964
John F. Kennedy	99	1961–1963	1917–1963
Bill Clinton	90	1993–2001	born 1946
Franklin D. Roosevelt	79	1933–1945	1882–1945
John Tyler	68	1841–1845	1790–1862
Barack Obama	48	2009–2017	born 1961
George W. Bush	47	2001–2009	born 1946
James Monroe	36	1817–1825	1758–1831
Martin Van Buren	34	1837–1841	1782–1862
Grover Cleveland	33	1885–1889	1837–1908
George H. W. Bush	31	1989–1993	1924–2018
John Quincy Adams	27	1825–1829	1767–1848
John Adams	25	1797–1801	1735–1826
Richard Nixon	20	1969–1974	1913–1994
Ronald Reagan	16	1981–1989	1911–2004
James K. Polk	13	1845–1849	1795–1849
Dwight D. Eisenhower	10	1953–1961	1890–1969
Joe Biden	10	2021–present	born 1942

Where are the super-rich capitalists?

- Many of the capitalists did not receive extraordinary profits
- Those invested in textiles faced a very competitive industry
- With a homogenous product and no major barriers to entry, textiles weren't a way to get rich
- Consumers were the ones getting the rewards
- The exception is railroads (which had barriers to entry)
- Even with railroads, there was enough competition in Britain to make consumers big beneficiaries (US railroad owners get incredibly rich)

The Industrial Revolution and Inequality

- The distribution of income tells us a fair amount about income equality
- However, it does not necessarily tell us about equality of opportunity
- We may tolerate more inequality if there is also more mobility
- We may tolerate less inequality if there are no opportunities to move up in the income distribution

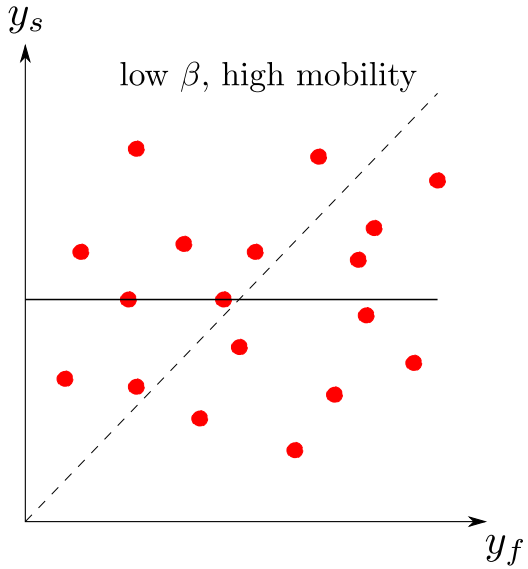
Modern Intergenerational Mobility

- With modern data, we can estimate intergenerational mobility by looking at the strength of the relationship between father and son earnings
- In particular, we can estimate an equation like the following:

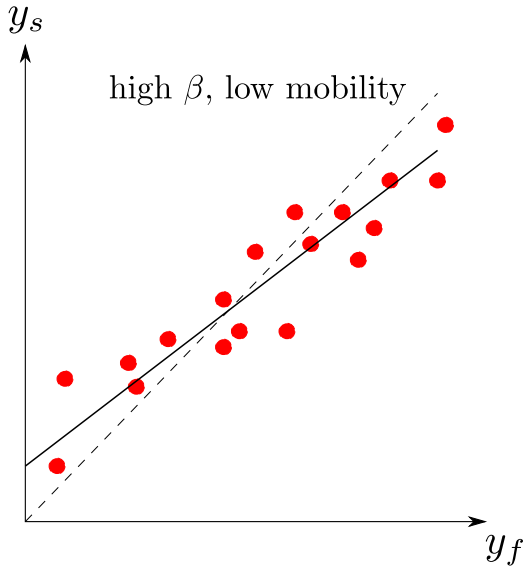
$$lny_s = \alpha + \beta lny_f + \varepsilon$$

- The larger the coefficient we get for β, the greater the impact of father's income on son's income
- So larger values for β indicate lower levels of income mobility
- We call β the intergenerational income elasticity

Modern Intergenerational Mobility



Modern Intergenerational Mobility



Modern Intergenerational Mobility

Country	Source	Elasticity
Brazil	Dunn (2007) (scaled)	0.52 (0.011)
US	Solon (1992)	0.41 (0.09)
UK	Dearden, Machin and Reed (1997) (scaled) and averaged with Nicoletti and Ermisch (2007)	0.37 (0.05)
Italy	Piraino (2007) (scaled)	0.33 (0.026)
France	Lefranc and Trannoy (2005) (scaled)	0.32 (0.045)
Norway	Nilsen et al (2008)	0.25 (0.006)
Australia	Leigh (2007a) revised as in Björklund and Jäntti (2008)	0.25 (.080)
Germany	Vogel (2006)	0.24 (.053)
Sweden	Björklund and Chadwick (2003)	0.24 (0.011)
Canada	Corak and Heisz (1999)	0.23 (0.01)
Finland	Pekkarinen et al. (2006) Österbacka (2001) Averaged as in Björklund and Jäntti (2008)	0.20 (.020)
Denmark	Munk et al (2008)	0.14 (0.004)

Modern Intergenerational Mobility

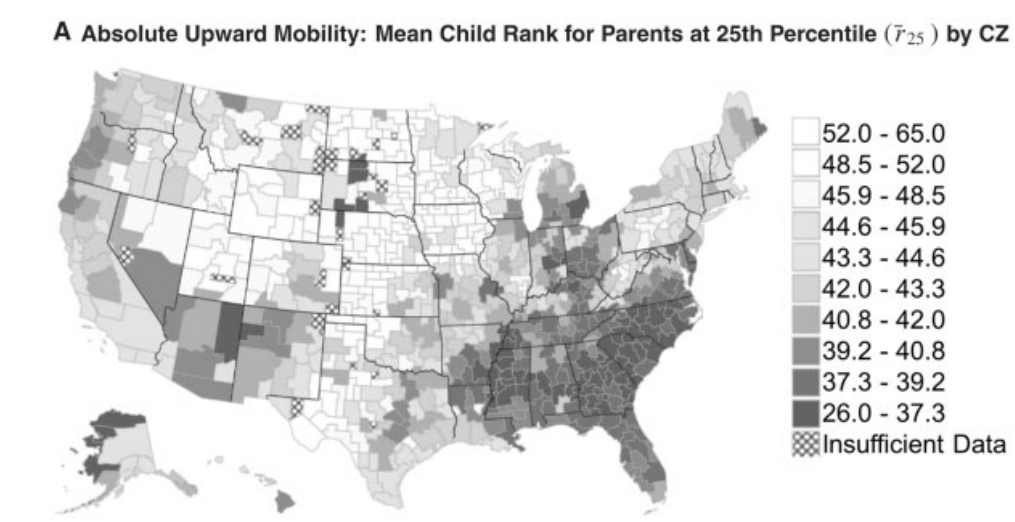
National Quintile Transition Matrix

Child quintile	Parent quintile 1	2	3	4	5
1	33.7%	24.2%	17.8%	13.4%	10.9%
2	28.0%	24.2%	19.8%	16.0%	11.9%
3	18.4%	21.7%	22.1%	20.9%	17.0%
4	12.3%	17.6%	22.0%	24.4%	23.6%
5	7.5%	12.3%	18.3%	25.4%	36.5%

Notes. Each cell reports the percentage of children with family income in the quintile given by the row conditional on having parents with family income in the quintile given by the column for the 9,867,736 children in the core sample (1980–1982 birth cohorts). See notes to Table I for income and sample definitions. See Online Appendix Table VI for an analogous transition matrix constructed using the 1980–1985 cohorts.

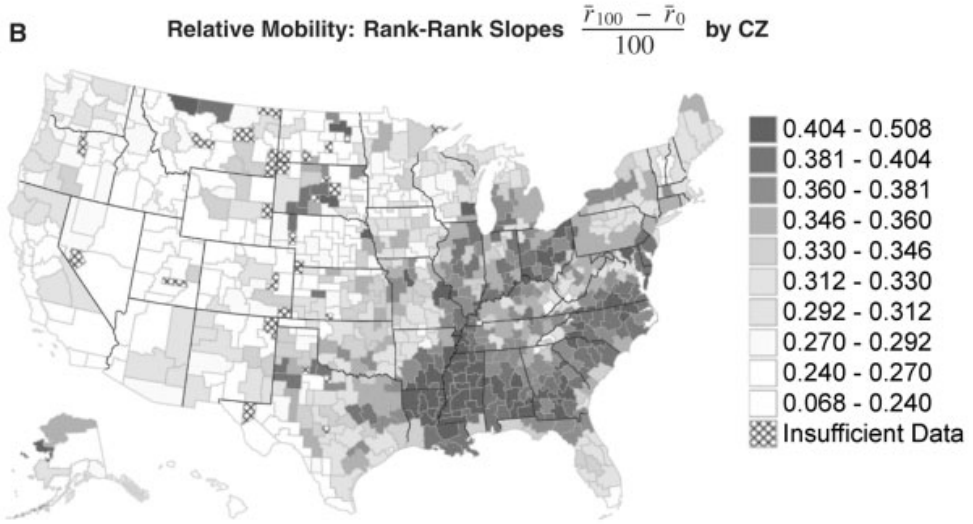
Chetty et al., Quarterly Journal of Economics, 2014

Modern Intergenerational Mobility



Chetty et al., Quarterly Journal of Economics, 2014

Modern Intergenerational Mobility



Chetty et al., Quarterly Journal of Economics, 2014

Some Warnings about Intergenerational Mobility Estimates

- We need to be a bit cautious with how we interpret intergenerational income elasticities (or other annual income-based measures)
- There are a few reasons why they may overstate mobility
  - Measurement error in income
  - Transitory fluctuations in income
  - The nature of income transmission

Somewhat Modern Intergenerational Mobility

- Income data let us see how mobility differs across countries today
- How do we tell how it has changed over time?
- As you know by now, historical income data is hard to come by
- This is especially true if we need to both parent and child incomes
- A couple of historical censuses let us look at income mobility for the US in the early 20th century

Somewhat Modern Intergenerational Mobility

Historical and modern mobility estimates for the United States

Intergenerational mobility measure:	Estimates		Sources	
	1915 to 1940	Modern	Historical	Modern
Intergenerational income elasticity	0.249	0.35 to 0.54	Feigenbaum (2015)	Lee and Solon (2009)
Income rank-rank coefficient	0.210	0.307 to 0.317	Feigenbaum (2015)	Chetty et al. (2014)
Educational persistence	0.187	0.46	Feigenbaum (2015)	Hertz et al. (2007)
Altham-Ferrie Statistic	16.03	20.76	Feigenbaum (2015)	Ferrie (2005)

This is a modified version of Table 1 in Feigenbaum (2015).

Somewhat Modern Intergenerational Mobility

- Intergenerational income data is too rare to make income mobility useful for other countries or other time periods
- One alternative is to look at occupational mobility across generations although even that is tough
- Long and Ferrie (2013) take this approach using linked US and British census data
- To estimate mobility, they construct and analyze occupation transition matrices

Somewhat Modern Intergenerational Mobility

TABLE 1—INTERGENERATIONAL OCCUPATIONAL MOBILITY IN BRITAIN AND THE US, 1949–1955 TO 1972–1973, FREQUENCIES
(*Column percent*)

	Father's occupation				
Son's occupation	White collar	Farmer	Skilled/semiskilled	Unskilled	Row sum
Britain (Table **P**)					
White collar	174	11	206	38	429
	(68.2)	(25.6)	(30.7)	(24.5)	
Farmer	2	9	3	1	15
	(0.8)	(20.9)	(0.4)	(0.6)	
Skilled/semiskilled	71	19	417	102	609
	(27.8)	(44.2)	(62.2)	(65.8)	
Unskilled	8	4	44	14	70
	(3.1)	(9.3)	(6.6)	(9.0)	
Column sum	255	43	670	155	1,123
US (Table **Q**)					
White collar	595	144	539	164	1,442
	(71.4)	(31.9)	(43.6)	(35.1)	
Farmer	3	61	7	5	76
	(0.4)	(13.5)	(0.6)	(1.1)	
Skilled/semiskilled	186	193	576	236	1,191
	(22.3)	(42.8)	(46.6)	(50.5)	
Unskilled	49	53	115	62	279
	(5.9)	(11.8)	(9.3)	(13.3)	
Column sum	833	451	1,237	467	2,988

Note: Occupation of father when respondent was age 14 (Britain) or age 16 (US), compared to occupation at survey in 1972 (Britain) or 1973 (US), males 31–37 (Britain) and 33–39 (US) in survey year.

Somewhat Modern Intergenerational Mobility

TABLE 3—INTERGENERATIONAL OCCUPATIONAL MOBILITY IN BRITAIN AND THE US, 1850–1851 TO 1880–1881, FREQUENCIES (*Column percent*)

	Father's occupation				
Son's occupation	White collar	Farmer	Skilled/semiskilled	Unskilled	Row sum
Britain (Table **P**)					
White collar	103	31	219	63	416
	(36.6)	(11.1)	(13.3)	(7.3)	
Farmer	8	114	39	21	182
	(2.8)	(40.9)	(2.4)	(2.4)	
Skilled/semiskilled	143	90	1,155	386	1,774
	(50.0)	(32.3)	(70.2)	(44.6)	
Unskilled	32	44	233	395	704
	(11.2)	(15.8)	(14.2)	(45.7)	
Column sum	286	279	1,646	865	3,076
US (Table **Q**)					
White collar	55	177	82	30	344
	(38.5)	(12.9)	(22.6)	(23.3)	
Farmer	44	850	92	35	1,021
	(30.8)	(62.0)	(25.3)	(27.1)	
Skilled/semiskilled	33	214	166	40	453
	(23.1)	(15.6)	(45.7)	(31.0)	
Unskilled	11	129	23	24	187
	(7.7)	(9.4)	(6.3)	(18.6)	
Column sum	143	1,370	363	129	2,005

Note: Occupation of father in 1851 (Britain) or 1850 (US) when son was age 13–19, compared to occupation of son in 1881 (Britain) or 1880 (US), males 43–49 in 1881 (Britain) or 1880 (US).

Somewhat Modern Intergenerational Mobility

- Long and Ferrie find a fairly mobile American society relative to Britain in the 1800's with American mobility rates converging to British rates in the 1900's
- This is telling us something about the evolution of mobility during industrialization but doesn't tell us what things looked like before industrialization
- There's no real chance to do this with Britain and the US using this occupation approach (useful census data only goes back to 1850)
- One solution: look at a country that industrializes much later
- Let's take a quick look at Cilliers and Fourie (2018)

Somewhat Modern Intergenerational Mobility

Table 9. Relative intergenerational mobility, summarised by birth cohort (percentages)

	Son's occupation				
***Slavery* 1806–1834**					
Father's occupation	**W**	**F**	**S**	**U**	**Row (n)**
White collar	47.3	36.2	10.7	5.8	224
Farmer	9.1	78.1	5.9	6.9	869
Skilled/semi-skilled	22.6	29.3	39.6	8.5	106
Unskilled	14.4	46.7	11.1	27.8	90
Col. (%)	17.2	64.6	9.9	8.3	1,289
***Stagnation* 1835–1867**	**Son's occupation**				
Father's occupation	**W**	**F**	**S**	**U**	**Row (n)**
White collar	51.2	33.5	11.3	4.0	224
Farmer	8.9	77.6	6.2	7.4	869
Skilled/semi-skilled	20.2	35.5	38.2	6.1	106
Unskilled	9.8	51.4	8.4	30.4	90
Col. (%)	17.2	64.6	9.9	8.3	1,289
***Diamonds* 1868–1886**	**Son's occupation**				
Father's occupation	**W**	**F**	**S**	**U**	**Row (n)**
White collar	42.9	39.7	12.8	4.5	224
Farmer	10.0	76.5	6.0	7.5	869
Skilled/semi-skilled	27.1	32.2	34.4	6.3	106
Unskilled	11.5	50.2	10.9	27.5	90
Col. (%)	17.2	64.6	9.9	8.3	1,289
***Gold* 1887–1909**	**Son's occupation**				
Father's occupation	**W**	**F**	**S**	**U**	**Row (n)**
White collar	45.5	35.6	13.5	5.4	224
Farmer	9.2	77.7	6.1	7.0	870
Skilled/semi-skilled	29.5	32.2	34.8	3.4	106
Unskilled	10.1	48.2	7.7	34.1	90
Col. (%)	17.2	64.6	9.9	8.3	1,289

Note: Marginal frequencies adjusted to match Slavery period.

Cilliers and Fourie (2018), "Occupational Mobility during South Africa's Industrial Take-Off"

Somewhat Modern Intergenerational Mobility

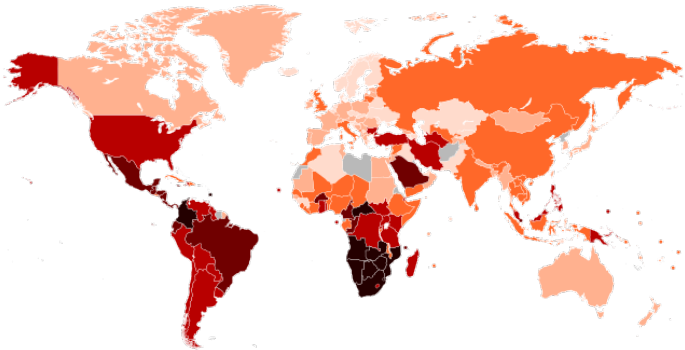
Table 11. Binary logistic regression with origin country and provincial dummies

	Model 1	Model 2	Model 3
Period (Slavery ref.)	1.000	1.000	1.000
Stagnation	1.108	0.963	1.009
Diamonds	1.220***	1.119	1.009
Gold	1.297***	1.298***	1.303***
Migrant status (Migrant father ref.)	1.497***	1.014	1.015
Origin country (Netherlands ref.)	1.000	1.000	1.000
France	1.018	1.107	1.101
Germany	1.169	1.385***	1.392***
UK	1.449***	1.098	1.099
Other west Europe	1.344***	1.067	1.067
Other east Europe	1.494*	1.344	1.344
Sibling rank (First born son ref.)	1.000	1.000	1.000
Province (Cape ref.)	1.000	1.000	1.000
Natal	1.046	1.243	1.240
OFS	1.229***	1.101	1.098
Transvaal	1.013	1.084	1.080
Father's class (White collar ref.)	1.000	1.000	1.000
Farmer		0.532***	0.444***
Skilled/semi-skilled		3.084***	2.202***
Unskilled		4.949***	4.591***
Origin class size			1.033**
Pseudo R^2	0.009	0.095	0.096
Prob > chi-square	0.000	0.000	0.000
Observations	9,494	9,494	9,494

Note: No mobility as base outcome. Estimates expressed as relative risks.
***p < 0.01, **p < 0.05, *p < 0.1.

Cilliers and Fourie (2018), "Occupational Mobility during South Africa's Industrial Take-Off"

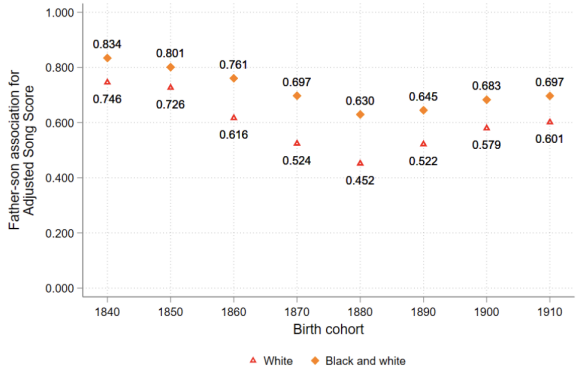
The Representativeness of Historical Data



Income inequality as measured by the Gini coefficient, darker shades indicate higher values.

The Representativeness of Historical Data

Figure 5. Father-son associations increase after including Black families
Panel A. Status measure adjusts for within-occupation differences by race and region



Ward (2023), "Intergenerational Mobility in American History: Accounting for Race and Measurement Error

Historical Intergenerational Mobility

- We don't really stand a chance of finding father and son's incomes or occupations prior to the Industrial Revolution (or really the 20th century)
- We need some alternative way to consider mobility across generations
- One possibility: use surnames that tell us whether ancestors were high status or low status
- Then look at high or low status groups in more recent periods to see how frequently these names appear
- Clark and Cummins (2015) identify rich names from probate records and poor names from prisoner records
- In *The Son Also Rises*, Clark is also going to consider using artisan and locative names

Historical Intergenerational Mobility

Anderson	John	1844-March	24	None given	None given	Being a rogue and a vagabond
Andrews	Benjamin	1848-June	27	Collier	Uttering a counterfeit coin	None given
Andrews	Benjamin	1848-October	27	None given	None given	Misdemeanour
Andrews	Charles	1842-January	22	Labourer	Assaulting a peace officer (See also George Hautin)	None given
Andrews	Eliza	1849-June	Not given	None given	Alleged theft from (victim)	None given
Andrews	George	1849-December	35	Waterman	Stealing trousers etc	None given
Andrews	George	1849-December	35	Waterman	Stealing ash poles	None given
Andrews	George	1850-April	35	None given	None given	Felony
Andrews	Henry	1845-March	22	Labourer	None given	Trespass in search of game
Andrews	Henry	1847-April	Not given	None given	Attempted defraud of (victim)	None given
Andrews	Henry	1849-July	Not given	None given	Alleged deception of (victim)	None given
Andrews	Jacob	1849-January	27	Labourer	Stealing wheat	None given
Andrews	Jacob	1849-April	27	None given	None given	Felony
Andrews	James	1842-October	22	Shoemaker	Stealing a basket and potatoes	None given
Andrews	James	1841-Summer	23	None given	None given	Larceny
Andrews	James	1842-February	38	Cordwainer	Stealing several trees	None given
Andrews	Jane	1844-December	28	None given	None given	Uttering counterfeit coin
Andrews	Mary	1845-October	20	Single woman	Obtaining mutton by false pretences	None given
Andrews	Sophia	1847-April	Not given	None given	Attempted defraud of (victim)	None given
Andrews	William	1840-October	56	Waterman	Stealing hops	None given
Andrews	William	1847-January	19	Labourer	Stealing a gun barrel etc	None given
Ankrett	Henry	1849-October	Not given	None given	Alleged theft from (victim)	None given

Calendar of Prisoners, The Old Bailey

Historical Intergenerational Mobility

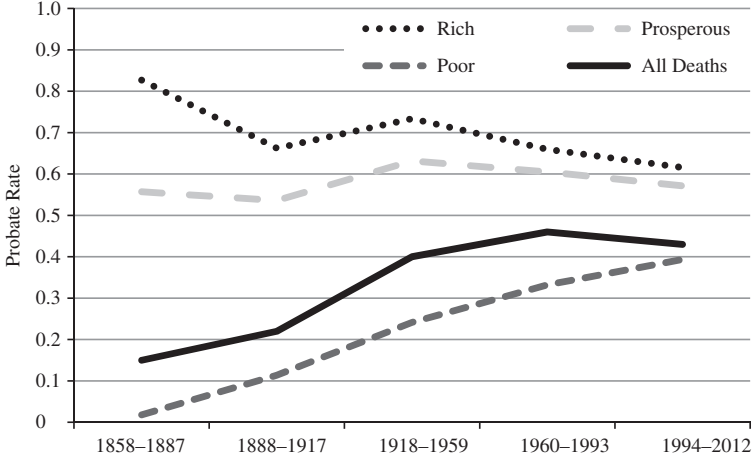


Fig. 3. *Probate Rates of Surname Types, by Generation*

Notes. The probate rate in a given generation is the number of people recorded in the probate registry divided by the number of people dying.

Source. Principal Probate Registry and GRO.

Historical Intergenerational Mobility

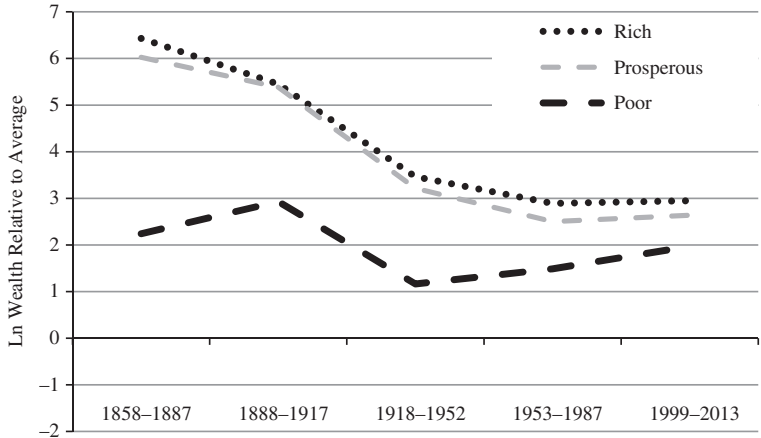


Fig. 4. *Average ln Probate Wealth, Those Probated, by Generation*

Notes. ln probate wealth by surname is measured as average ln wealth by surname minus the estimated overall average ln probate wealth (from the *Brown* surname).

Historical Intergenerational Mobility

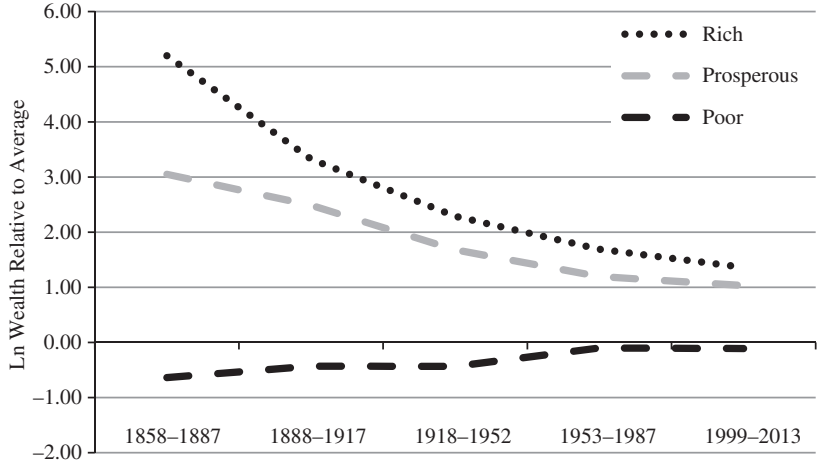


Fig. 5. *Average Log Probate Value, Including Those Not Probated, by Generation*
Source. Table 5.

Historical Intergenerational Mobility

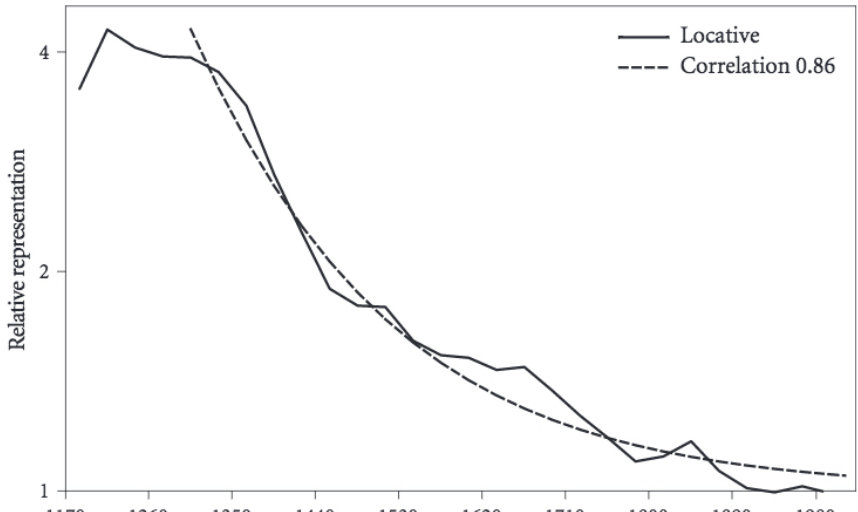


FIGURE 4.4. Locative surnames at Oxford and Cambridge, 1170–2012.

Historical Intergenerational Mobility

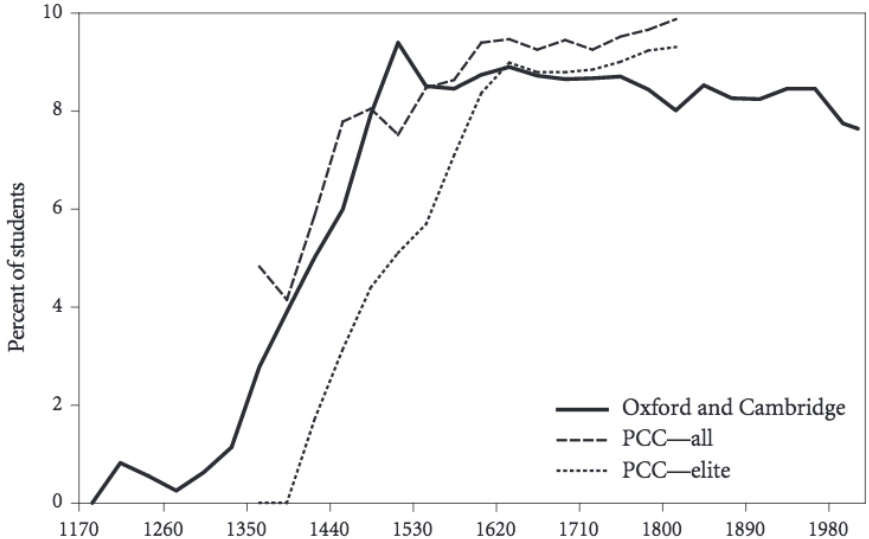


FIGURE 4.1. Percentage of artisan surnames among English elites, 1170–2012.

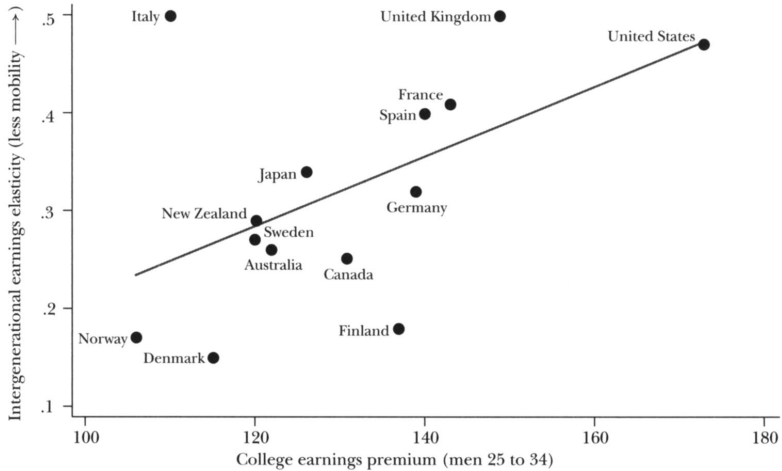
Changes in Intergenerational Mobility Over Time

- British elites and non-elites rose and fell in socioeconomic status at rates comparable to modern times
- Consider our two living super-rich Americans
- Bill Gates' grandfather was a national bank president and his father was a prominent lawyer
- Warren Buffet's father was a four-term congressman
- We may not have hereditary titles or a landed elite, but we do have status passed from one generation to the next today
- Why might that be the case in what we like to think of our society as a meritocracy?

Inequality and Mobility

Figure 4

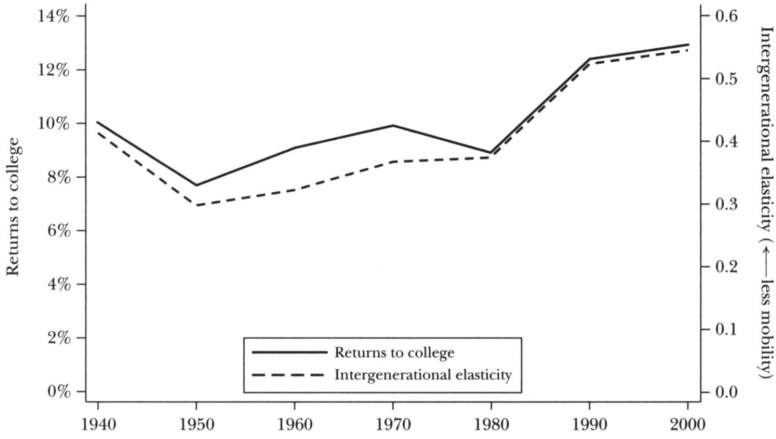
Higher Returns to Schooling are Associated with Lower Intergenerational Earnings Mobility



Inequality and Mobility

Figure 5

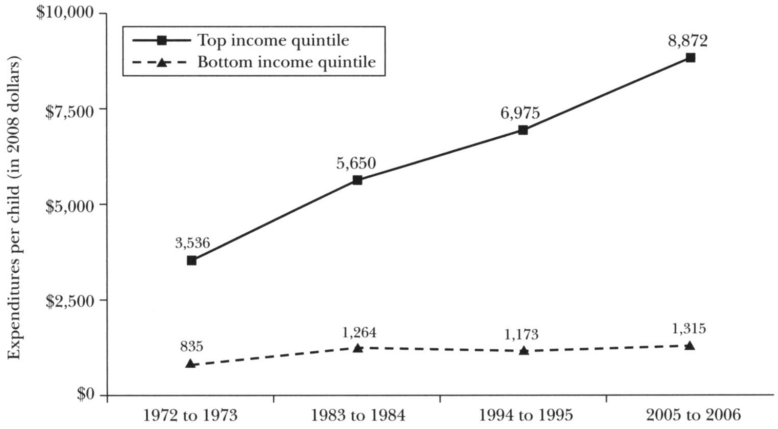
The Higher the Return to College, the Lower the Degree of Intergenerational Mobility: United States, 1940 to 2000



Inequality and Mobility

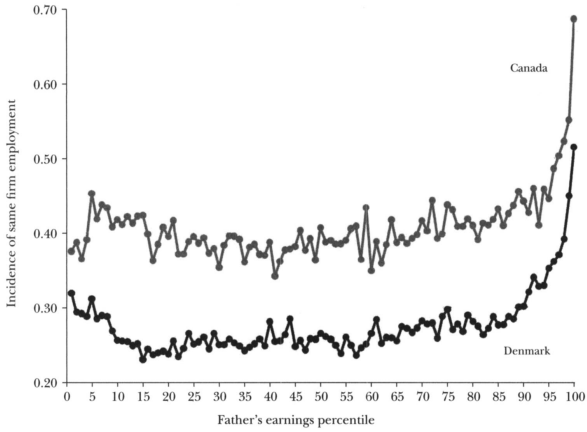
Figure 6

Money Matters: Higher-Income Families in the United States Have Higher Enrichment Expenditures on Their Children



Inequality and Mobility

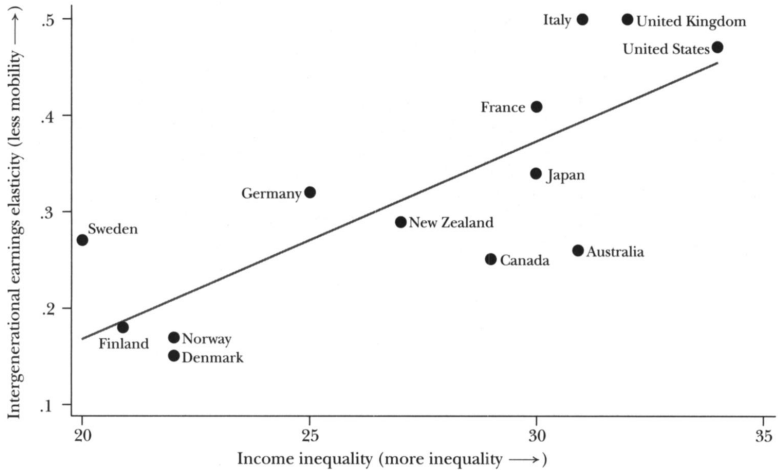
Figure 7
Proportion of Sons Currently Employed or Employed at Some Point with an Employer their Father had Worked for in the Past: Canada and Denmark
(by father's earnings percentile)



Inequality and Mobility

Figure 1

The Great Gatsby Curve: More Inequality is Associated with Less Mobility across the Generations



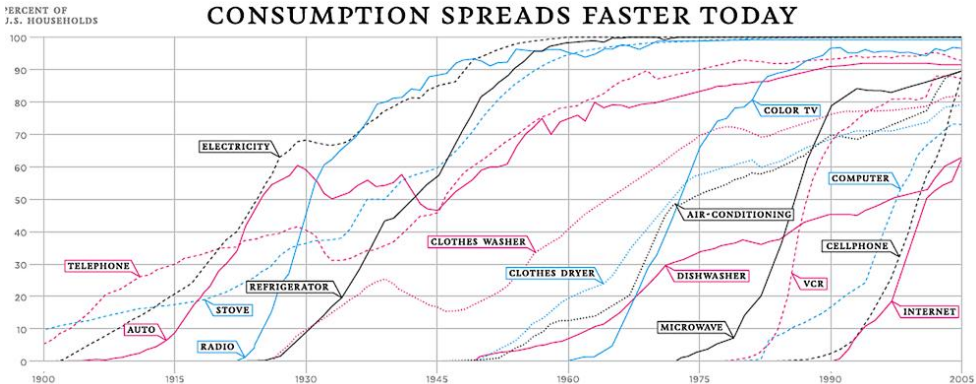
Inequality and Mobility

In 1972 a storm of protest from blue-collar workers greeted Senator McGovern's proposal for confiscatory estate taxes. They apparently wanted some big prizes maintained in the game. The silent majority did not want the yacht clubs closed forever to their children and grandchildren while those who had already become members kept sailing along. – Arthur Okun, 1975

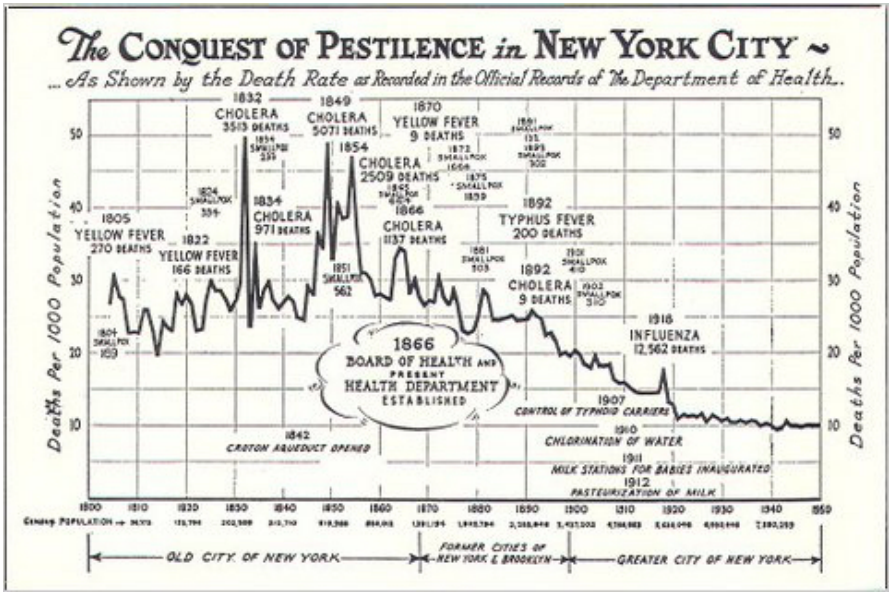
An Empirical Test of the Increases in the Standard of Living

- Let's now take a slightly different approach to assessing how much industrialization has improved the standard of living
- We'll forgo any more fancy analysis and instead take a much simpler approach
- It boils down to the following question: would you rather live in this era or some other era?
- To do this, we'll do two comparisons
  - Living today at the mean income or living in a previous decade in the US at the 90th income percentile
  - Living today at the poverty line or living in a previous century in Britain at the 99th income percentile

An Empirical Test of the Increases in the Standard of Living



An Empirical Test of the Increases in the Standard of Living

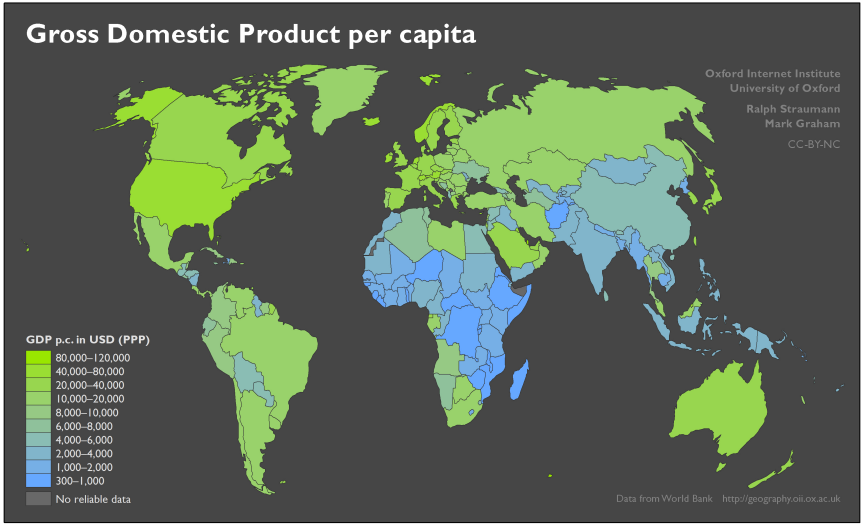


An Empirical Test of the Increases in the Standard of Living

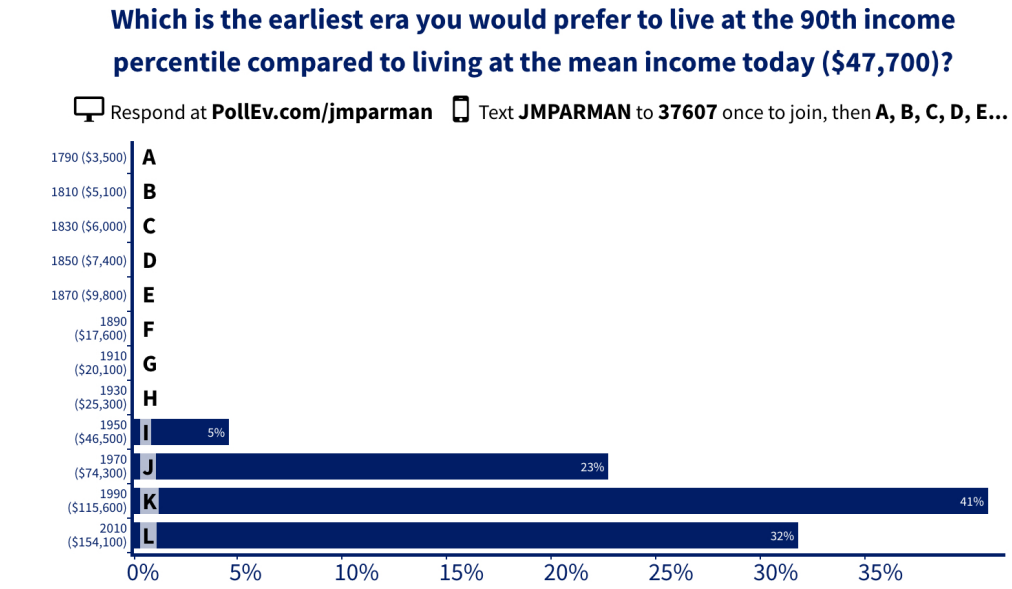
- The relevant era-specific incomes are given in parentheses
- All of the incomes are in 2010 US dollars
- To the poll...

Set your browser to PollEv.com/jmparman to join the poll.

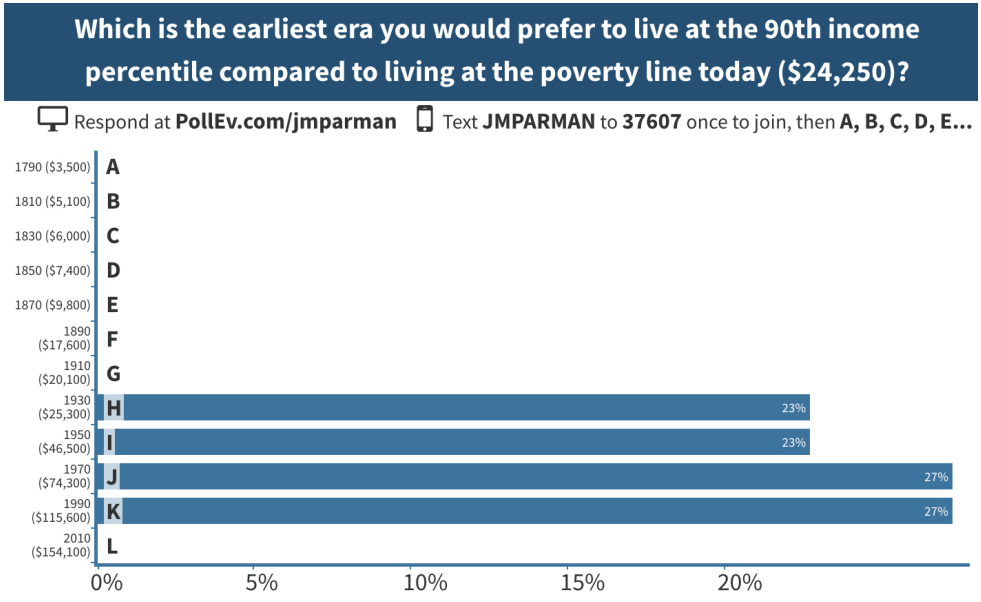
So the world is a happy place because of the Industrial Revolution?



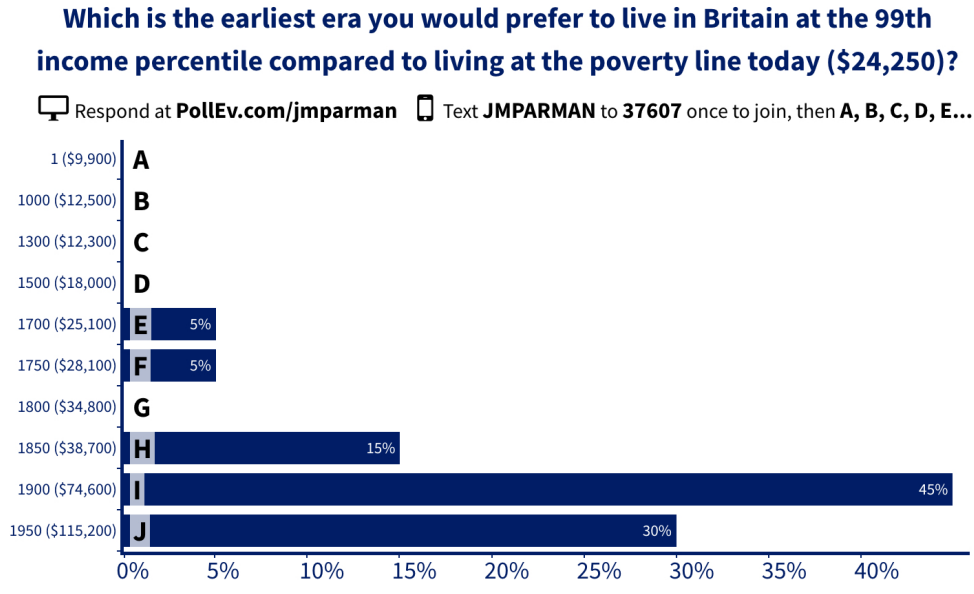
So the world is a happy place because of the Industrial Revolution?



So the world is a happy place because of the Industrial Revolution?



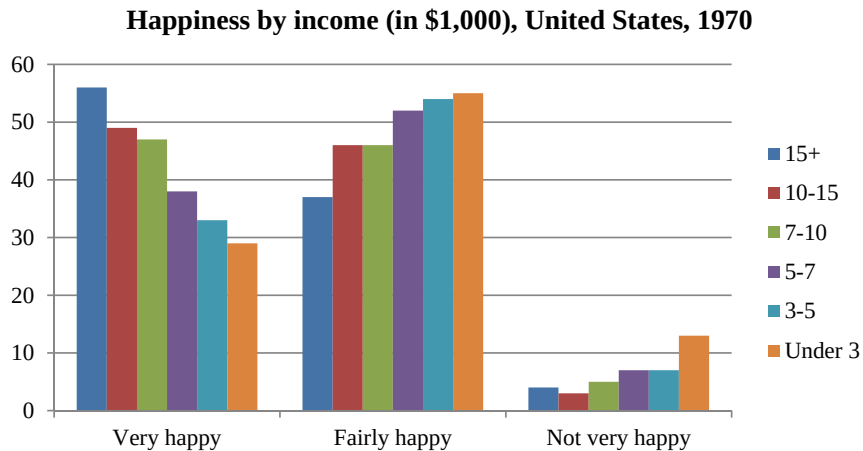
So the world is a happy place because of the Industrial Revolution?



So the world is a happy place because of the Industrial Revolution?

- So judging by income (and your responses), a good chunk of the world is a happy place
- However, there is still the issue of the Great Divergence
- A large set of countries has still been left out of these income gains
- While industrialization may have benefited everyone within countries, it has led to divergence across countries
- There is a second issue with claiming the world is a happy place
- Does more income mean greater happiness?

So the world is a happy place because of the Industrial Revolution?



So the world is a happy place because of the Industrial Revolution?

Percentage not very happy in lowest and highest status groups, 1965

Country	Low status group	High status group
Great Britain	19	4
West Germany	19	7
Thailand	15	6
Philippines	15	5
Malaysia	20	10
France	27	6
Italy	42	10

So the world is a happy place because of the Industrial Revolution?

Personal happiness rating (on a 0 to 10 scale) in lowest and highest status groups, 1960

Country	Lowest status group	Highest status group	Difference
United States	6.0	7.1	1.1
Cuba	6.2	6.7	0.5
Israel	4.0	6.5	2.5
West Germany	4.9	6.2	1.3
Japan	4.3	5.8	1.5
Nigeria	4.7	5.8	1.1
Poland	3.7	4.9	1.2
India	3.0	4.9	1.9
Dominican Republic	1.4	4.3	2.9

So the world is a happy place because of the Industrial Revolution?

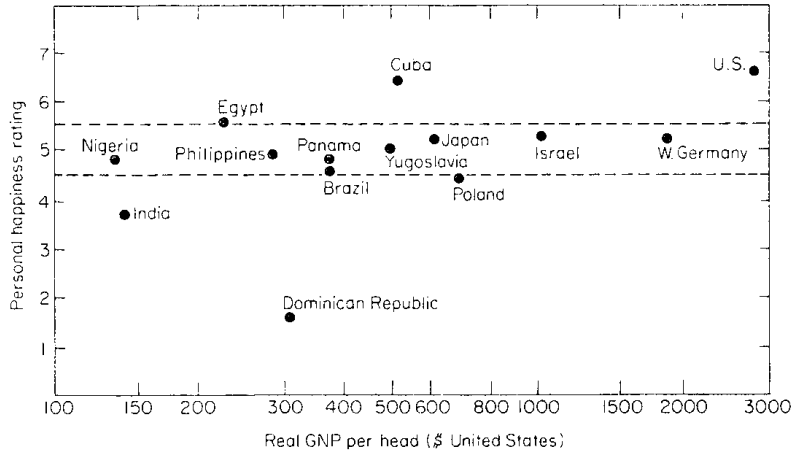
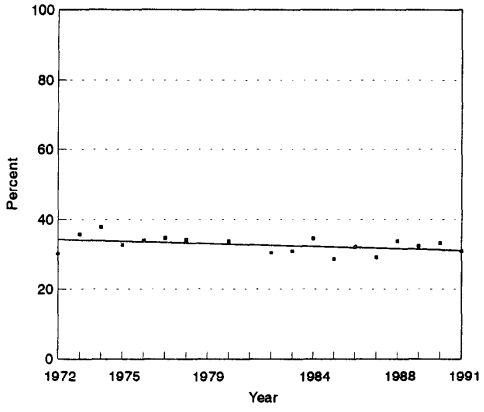


FIG. 1. Personal happiness rating and GNP per head, 14 countries, ca. 1960. (Source: Table 6.)

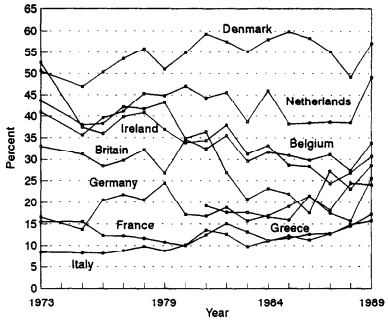
So the world is a happy place because of the Industrial Revolution?



Source and notes: National Opinion Research Center, 1991. The question is, "Taken all together, how would you say things are these days -- would you say that you are very happy, pretty happy, or not too happy?" An ordinary least squares regression line is fitted to the data; the time trend is not statistically significant.

Fig. 1. Percent very happy, United States, 1972–1991.

So the world is a happy place because of the Industrial Revolution?



Source and notes: Inglehart et al. 1992. The question asked is, "Generally speaking, how satisfied are you with your life as a whole? Would you say that you are very satisfied, fairly satisfied, not very satisfied, or not at all satisfied?" Ordinary least squares regressions (not shown) yielded time trends that were not significant for five countries, significant and positive for two, and significant and negative for two.

Percent very satisfied with their lives in general

So the world is a happy place because of the Industrial Revolution?

- The evidence on happiness leaves us with a few things to think about
- Within countries, income is positively correlated with happiness
- Across countries we also see somewhat of a positive correlation
- However, happiness seems relatively constant over time
- This is despite dramatic increases in income over time
- What's going on here?

Interviewer questions for Cantril (1965)

(A) All of us want certain things out of life. When you think about what really matters in your own life, what are you wishes and hopes for the future? In other words, if you imagine your future in the best possible light, what would your life look like then, if you are to be happy? Take you time in answering; such things aren't easy to put into words.

Interviewer questions for Cantril (1965)

PERMISSIBLE PROBES: What are your hopes for the future? What would your life have to be like for you to be completely happy? What is missing for you to be happy? [Use also, if necessary, the words 'dreams' and 'desires.']
OBLIGATORY PROBE: Anything else?

Interviewer questions for Cantril (1965)

(B) Now, taking the other side of the picture, what are your fears and worries about the future? In other words, if you imagine your future in the worst possible light, what would your life look like then? Again, take your time in answering.

Interviewer questions for Cantril (1965)

PERMISSABLE PROBE: What would make you unhappy? [Stress the words 'fears' and 'worries.']
OBLIGATORY PROBE: Anything else?

Interviewer questions for Cantril (1965)

Here is a picture of a ladder. Suppose we say that the top of the ladder (POINTING) represents the best possible life for you and the bottom (POINTING) represents the worst possible life for you. (C) Where on the ladder (MOVING FINGER RAPIDLY UP AND DOWN LADDER) do you feel you personally stand at the present time?

Let's give it a try ourselves

- To see this in action, let's take a quick survey ourselves
- We'll answer a few of the questions from Solnick and Hemenway (1998)
- To the poll...

Set your browser to PollEv.com/jmparman or text JMPARMAN to 37607 to join the poll.

Let's give it a try ourselves

- For each question, Solnick and Hemenway establish a 'positional' case and an 'absolute' case
- The positional case involved having double the societal average, but half of the level in the absolute case
- The absolute case involved having double the level of the positional case, but half of the societal average
- What did Solnick and Hemenway get?
  - 56 percent preferred the positional scenario for income
  - 18 percent preferred the positional scenario for vacation days
  - 33 percent preferred the positional scenario for the supervisor
  - 80 percent preferred the positional scenario for the child's attractiveness

So the world is a happy place because of the Industrial Revolution?

- These happiness surveys are eliciting responses based on individuals' own frame of reference defining the range from unhappy to happy
- When asked about what would make me unhappy, my answer typically isn't "the plague"
- When asked about what would make me happy, my answer isn't "hovercrafts"
- So zero and ten on the scale are relative to the current state of the world
- Economic development keeps shifting the happiness goal posts
- This leaves us with a somewhat complicated answer to how much better off we are

Announcements

- We're winding down the semester
- We'll spend the next week on the the distribution of gains of industrialization and then use our final lecture next week as a wrap up/review for the final
- Grades and feedback on Assignment 4 are up on Blackboard
- Remember that Assignment 5 is due Thursday at 5pm

Announcements

- Assignment 5 is a bit different than the others, here is what it will be graded on:
  - Passages coming from the right centuries
  - Passages coming from non-academic sources
  - Passages relating to technology
  - Proper citations
- If you want to update your submissions, just fill out the form again (I'll grade your most recent submission)
- To make things a little more fun and recognize your efforts, we'll have a prize for the best passage from each century as judged by the prize committee (my wife)
- Don't get too excited, the prize is a sticker of my dog

Announcements

Announcements

- Here's the game plan for the last lectures
- Today, we'll wrap up talking about economic mobility over time and across space
- We'll also leave time at the end of the lecture today for course evaluations
- On Tuesday, we'll take some time to discuss Assignment 5 and the use of text analysis in economic history and then we'll spend some more time thinking about the overall improvements in the standard of living over time
- Next Thursday will be devoted to final exam details and a review to wrap things up
- Remember that Assignment 5 is due Thursday at 5pm

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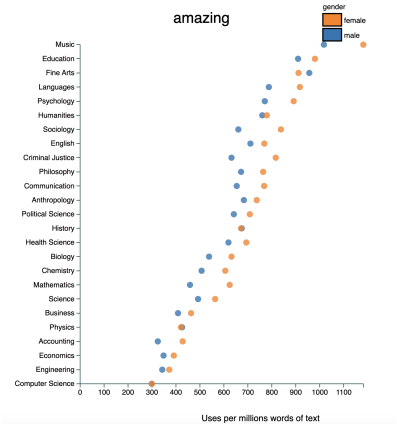
Announcements

Course Evaluations



http://evals.wm.edu/

Announcements

Daphne eagerly awaits the decision of the quote committee (and the arrival of the stickers).

Text as Data

- We're going to start by talking about the quotes from Assignment 5
- Let's begin by going over the basics of converting text to computer-analyzable data
- Here's what I did over the weekend (code is up on Blackboard and clearly shows that I was learning as I went along):

Text as Data

- Google kindly lets you link your forms to spreadsheets that get automatically updated when new responses are submitted
- Good news is you can directly download that as a csv file, bad news is encoding is annoying so a little clean up by hand takes place before downloading (Google Sheet's clean() command is super useful)
- Once downloaded, the key columns in the csv file are the quotes and your sentiment scores
- Time to work on those in Python...

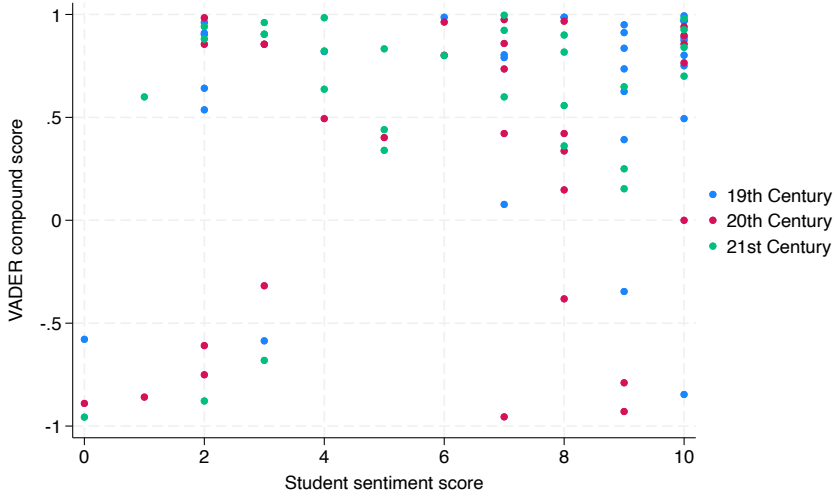
Text as Data

- Python let's you analyze language with the *nltk* and *pandas* libraries
- *nltk* has a built-in sentiment analysis tool but to use it, we need to clean up the quotes:
  - First, we're going to convert everything to lower case
  - Next, we *tokenize* (let Python know each word is a word)
  - Then, we remove *stop words* ('the', 'and', etc.)
  - Finally, we *lemmatize* the words (e.g., 'planned' and 'planning' both become 'plan')

Text as Data

- Now it's time to let machines do their magic
- I used the VADER sentiment analysis to create polarity scores for each quote
- This returns negative, neutral, positive and compound scores
- Note that VADER is pretrained on other data (not necessarily great for our purposes)
- In addition to sentiment analysis, I used nltk's FreqDist functions to pull common words and bigrams
- Then to Stata...

Text as Data


VADER compound score
1
.5
0
-.5
-1
0
2
4
6
8
10
Student sentiment score
19th Century
20th Century
21st Century

Text as Data

		Twenty-first Century Vader: Negative	Twenty-first Century Vader: Positive
Student	Negative	3	9
	Positive	0	15

Text as Data

Twentieth Century

Student	Vader: Negative	Vader: Positive
Negative	5	5
Positive	4	14

Text as Data

		Nineteenth Century: Vader	
		Negative	Positive
Student	Negative	2	6
	Positive	2	20

Text as Data

The past decade has been more fruitful than any period in the history of medical research. One after another, glamorous new weapons against death have tumbled from research laboratories. Diseases once considered 100 percent fatal have yielded. Pneumonia, former destroyer of 100,000 American lives a year, now takes only a quarter that many. Thus, with pneumonia alone, these drugs have saved almost as many lives as war destroyed. People are generally appreciative of these triumphs over death. At the same time, these discoveries have come from the laboratory in such rapid-fire order that widespread confusion exists.

Student score: 9/10, Vader score:-0.93
Student 1, Vader 0

Text as Data

- So how much promise do we see in text analysis as a useful tool for economic historians?
- Some important considerations:
  - What textual sources survive?
  - Which are we more likely to find? Which should we place more weight on?
  - What corpus do we use to train sentiment analyzers? What sentiments can we capture?