Labor Market Polarization

ECON 499: Economics of Inquality

Winter 2018

So far:

- Top incomes have diverged rapidly since the 1980s
  - True in the cross section and life-cycle (for men and women)
  - Top incomes largely determined by market forces ("talent")
  - How do people acquire talents?
  - Why are "talents" more valued today than in the past?

Changes in inequality

- Measure inequality with the 90/10 quantile ratio
- Since top 10% income share increasing (Piketty and Saez), expect 90/10 ratio to grow
- Similar to quantile ratio, compare relative wages of college educated vs non college educated

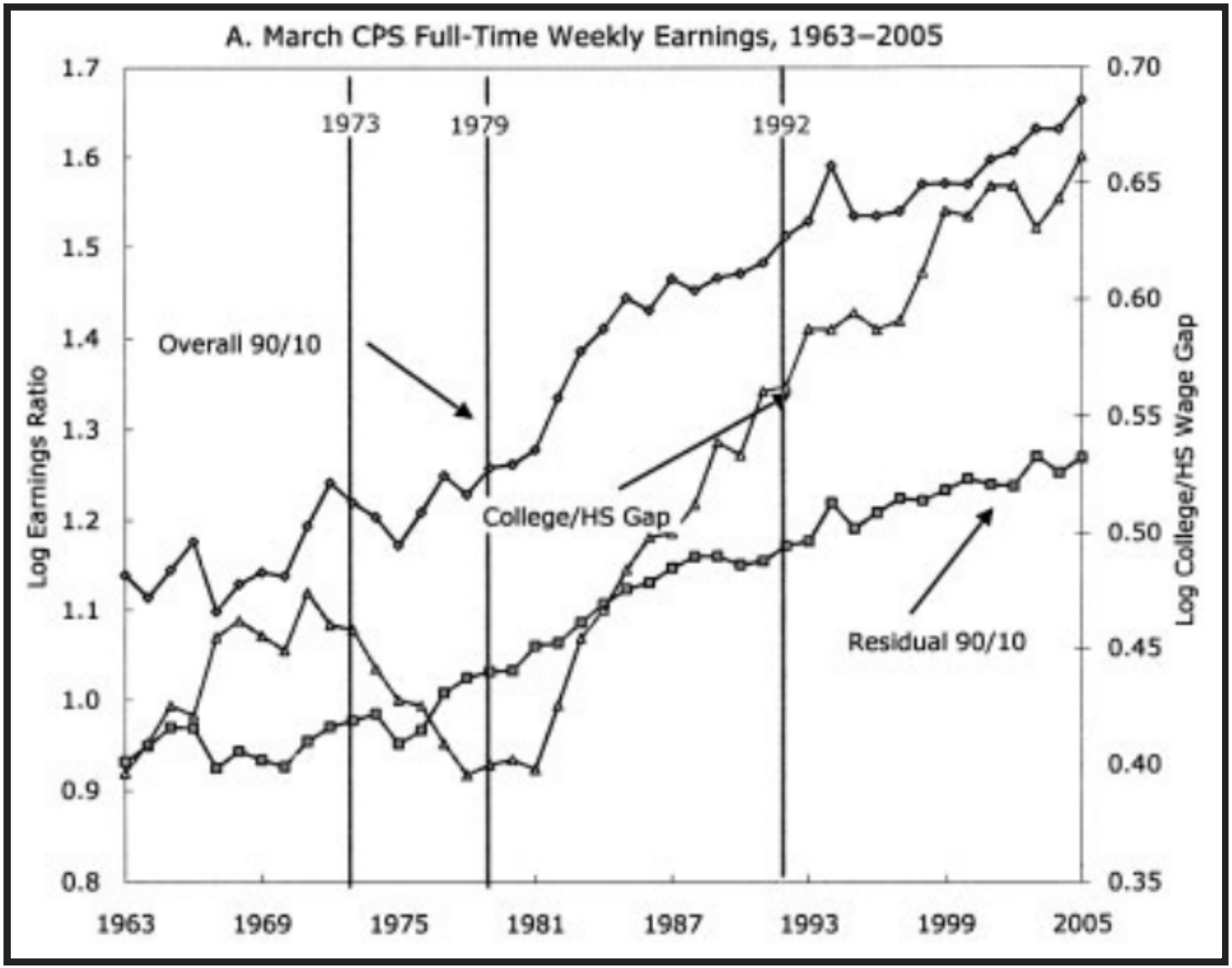
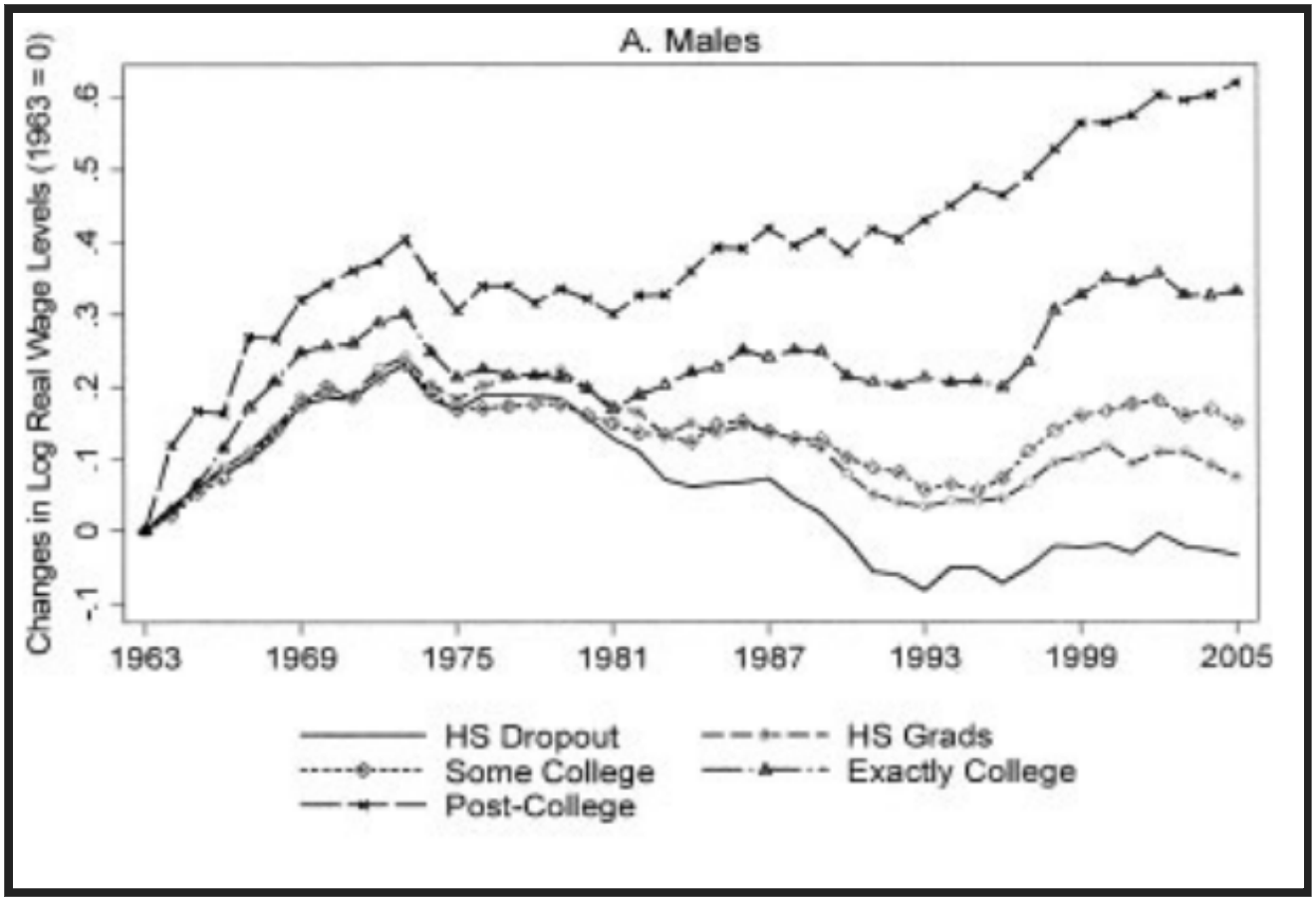

A. March CPS Full-Time Weekly Earnings, 1963–2005
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
Log Earnings Ratio
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
Log College/HS Wage Gap
1973
1979
1992
Overall 90/10
College/HS Gap
Residual 90/10
1963
1969
1975
1981
1987
1993
1999
2005

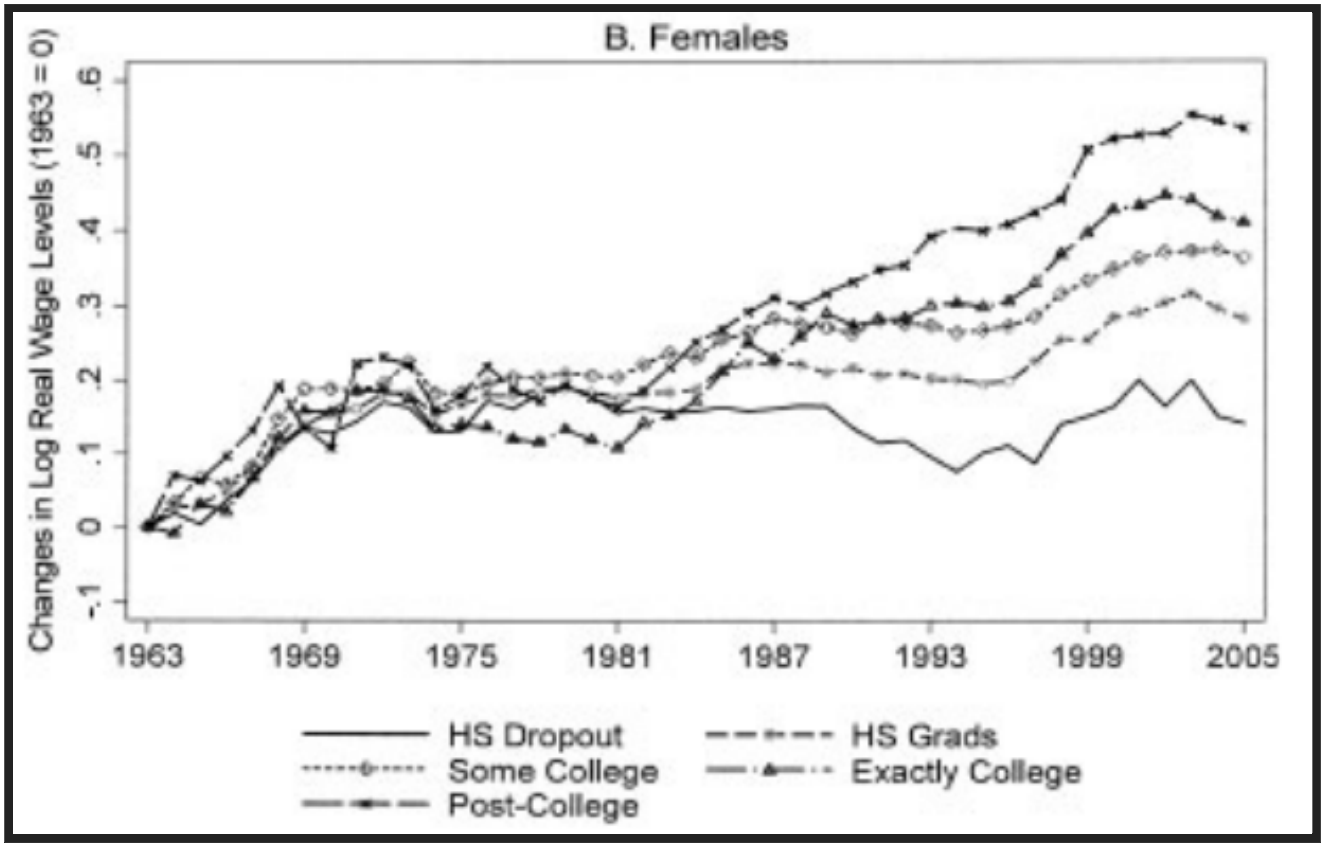
TABLE 1.—CHANGES IN REAL, COMPOSITION-ADJUSTED LOG WEEKLY WAGES FOR FULL-TIME, FULL-YEAR WORKERS, 1963–2005.
(100 × CHANGE IN MEAN LOG REAL WEEKLY WAGES)

	1963–1971	1971–1979	1979–1987	1987–1995	1995–2005	1963–2005
All	19.5	0.6	−0.8	−4.8	7.6	22.2
Sex						
Men	21.1	0.1	−4.9	−7.8	6.7	15.3
Women	17.3	1.4	4.9	−0.7	9.0	31.8
Education (years of schooling)						
0–11	17.0	1.8	−8.4	−10.3	2.5	2.6
12	17.6	3.2	−3.2	−6.6	5.8	16.8
13–15	18.6	0.6	1.2	−5.3	9.5	24.6
16+	25.4	−4.2	6.8	2.8	12.5	43.3
16–17	22.9	−4.9	5.6	1.0	11.9	36.5
18+	31.3	−2.6	9.5	6.8	14.0	59.0
Experience (males)						
5 years	20.0	−3.6	−8.5	−7.6	9.0	9.3
25–35 years	21.6	3.4	−1.6	−8.1	3.8	19.2
Education and experience (males)						
Education 12						
Experience 5	19.4	0.7	−16.1	−10.3	7.1	0.7
Experience 25–35	17.0	6.3	−2.5	−7.6	0.3	13.6
Education 16+						
Experience 5	23.1	−11.0	9.3	−1.9	10.0	29.5
Experience 25–35	35.0	1.7	2.6	−2.2	13.8	50.9

Skilled workers

- The supply of skilled workers has been increasing steadily
- 10% of workforce had college education in 1960
- 30% in 2005
- We would expect wages for skilled workers to decline


A. Males
Changes in Log Real Wage Levels (1963 = 0)
-.1
0
.1
.2
.3
.4
.5
.6
1963
1969
1975
1981
1987
1993
1999
2005
HS Dropout
HS Grads
Some College
Exactly College
Post-College

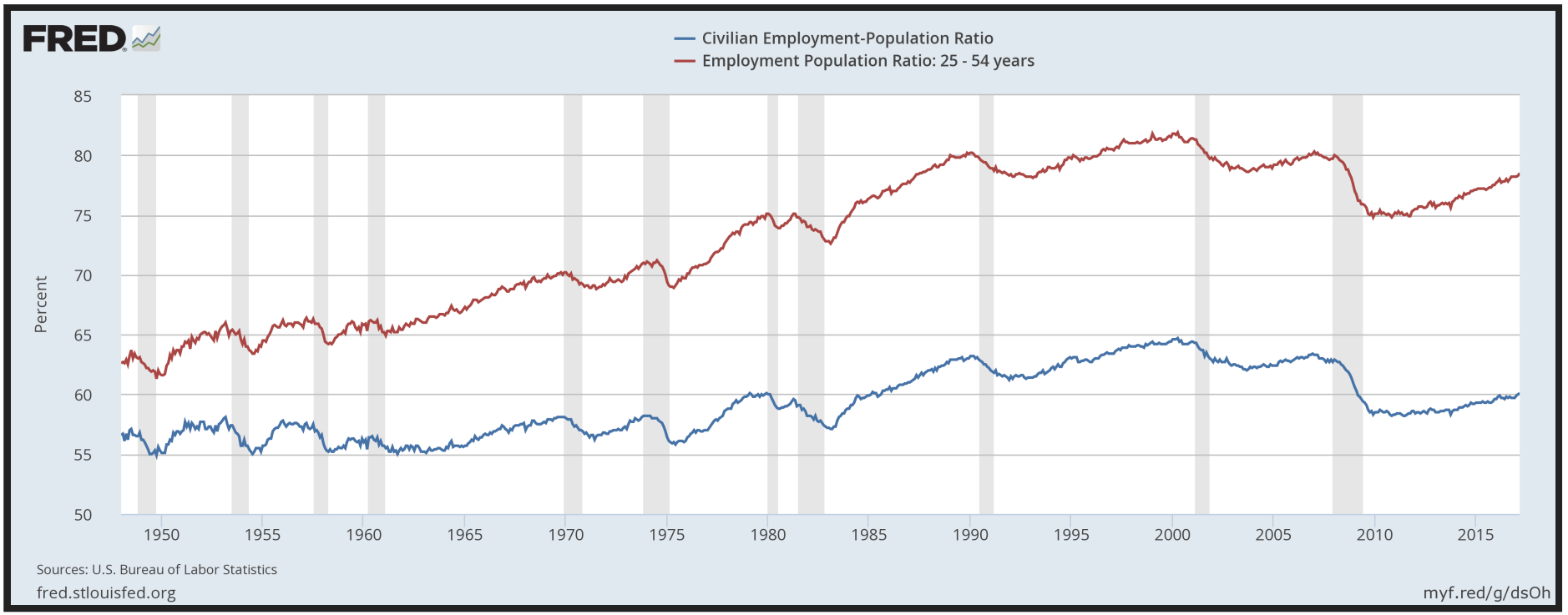

B. Females
Changes in Log Real Wage Levels (1963 = 0)
-.1
0
.1
.2
.3
.4
.5
.6
1963
1969
1975
1981
1987
1993
1999
2005
HS Dropout
HS Grads
Some College
Exactly College
Post-College

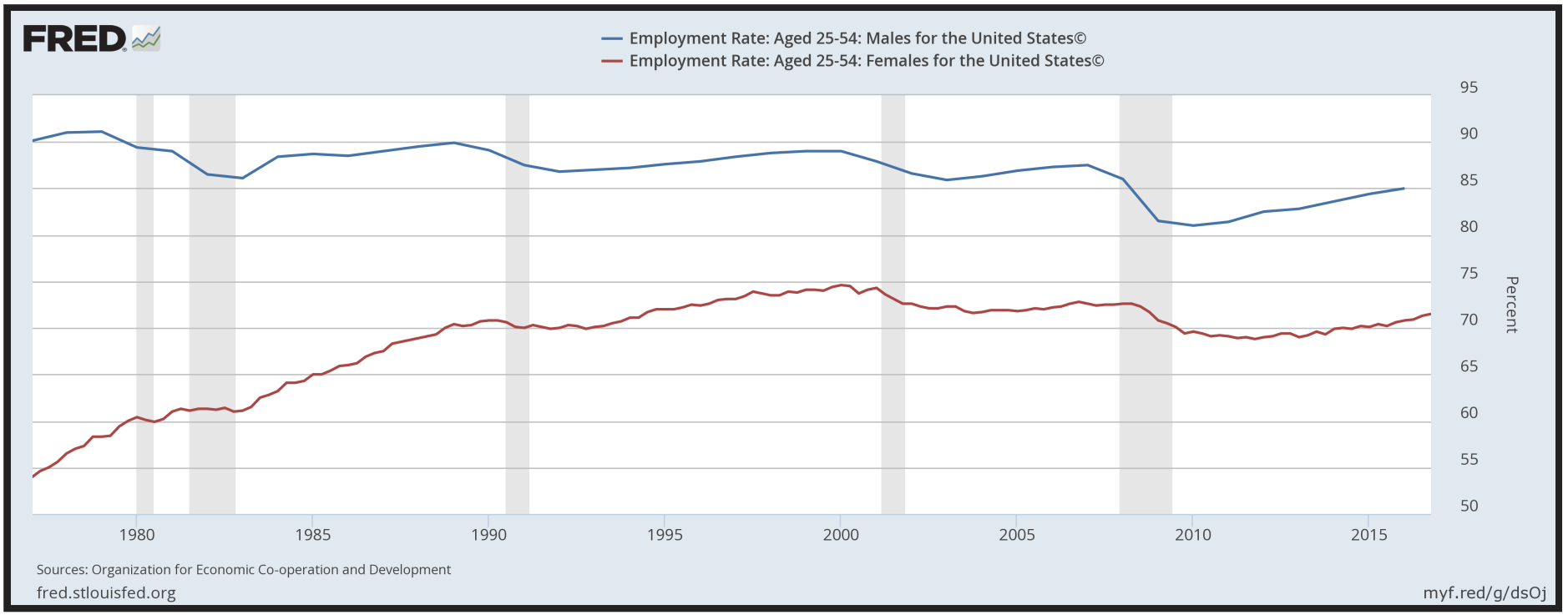
The skill premium

- The skill premium is the "reward" to education in the form of increased wages
- The wage premium has been increasing steadily
- Supply also increasing
- This means demand for skilled labor must be increasing at a faster rate

Why Are There Still So Many Jobs? (Autor, 2015)

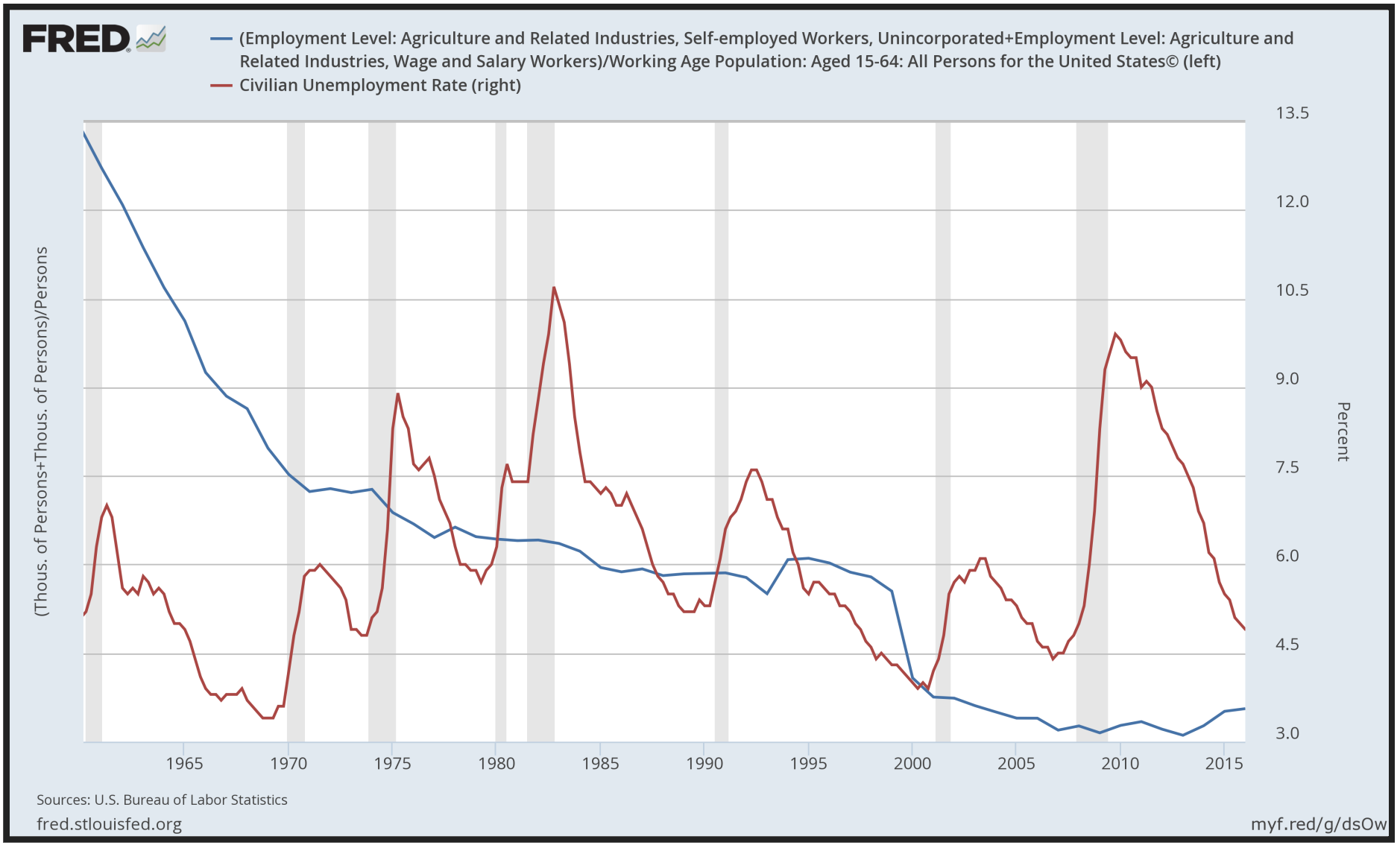
- Technology and "automation" have increased rapidly, yet unemployment doesn't seem to have changed
- Why hasn't automation created unemployment?
- What are the implications of this technological change?


FRED
Civilian Employment-Population Ratio
Employment Population Ratio: 25 - 54 years
Percent
85
80
75
70
65
60
55
50
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
Sources: U.S. Bureau of Labor Statistics
fred.stlouisfed.org
myf.red/g/dsOh


FRED
Employment Rate: Aged 25-54: Males for the United States©
Employment Rate: Aged 25-54: Females for the United States©
95
90
85
80
75
70
65
60
55
50
Percent
1980
1985
1990
1995
2000
2005
2010
2015
Sources: Organization for Economic Co-operation and Development
fred.stlouisfed.org
myf.red/g/dsOj

Automation

- Technology replacing jobs is not a new phenomenon
- Many agricultural jobs have been automated
- 41% of all workers in 1900, 2% today


FRED
(Employment Level: Agriculture and Related Industries, Self-employed Workers, Unincorporated+Employment Level: Agriculture and Related Industries, Wage and Salary Workers)/Working Age Population: Aged 15-64: All Persons for the United States© (left)
Civilian Unemployment Rate (right)
(Thous. of Persons+Thous. of Persons)/Persons
Percent
13.5
12.0
10.5
9.0
7.5
6.0
4.5
3.0
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
Sources: U.S. Bureau of Labor Statistics
fred.stlouisfed.org
myf.red/g/dsOw

Complements and substitutes

Complements:

- Factors that are used together in the production process
- Example: Programmers and computers

Substitutes:

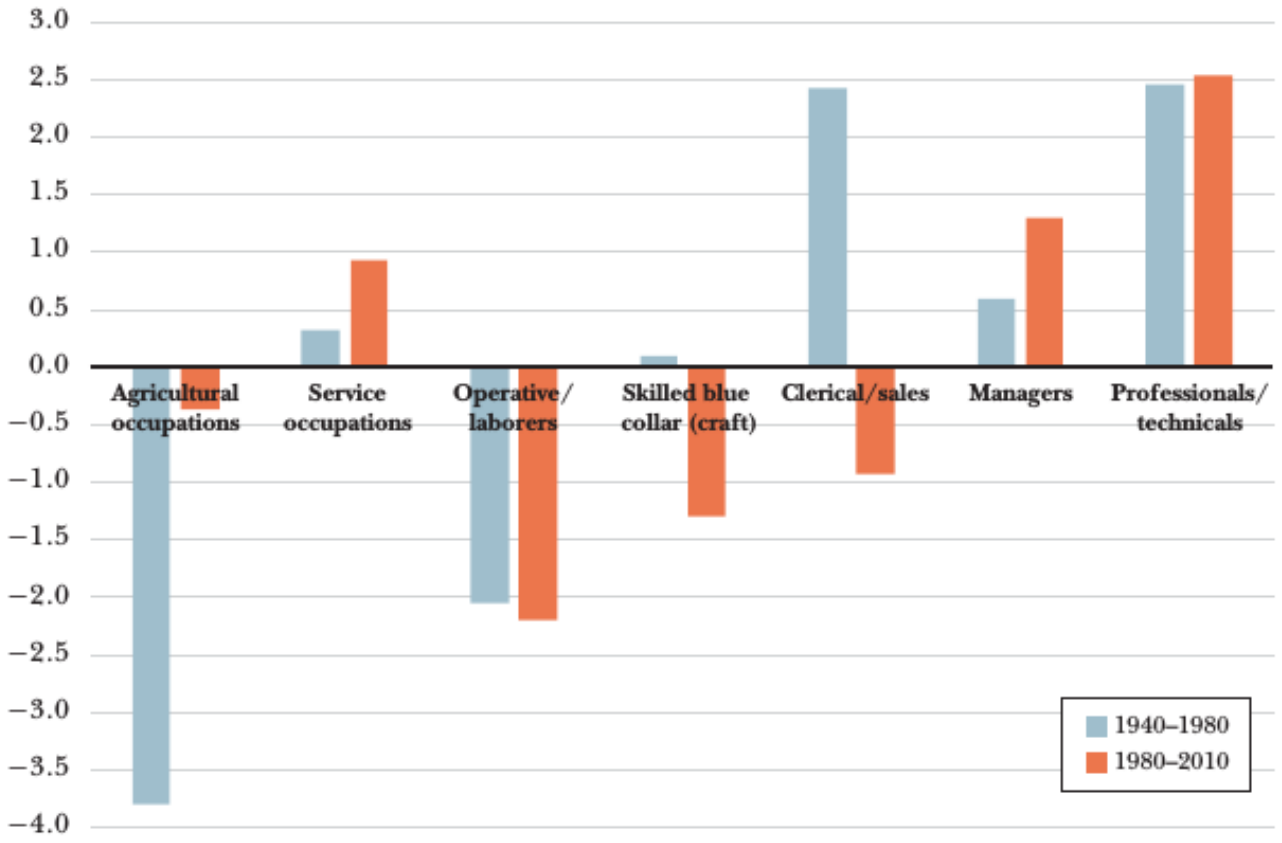
- Factors that can replace one another
- Example: Farm worker, combine harvester

Technology as a complement

- Some tasks are complemented by technological innovation
- Faster computers make programmers (and economists!) more productive
- ATMs allow bank tellers to do other work, e.g. customer service, sales, etc
- Workers have historically moved to technology-complementary industries as jobs are automated
- Increase in technology-complementary jobs offsets losses in substituted jobs

Figure 1

Average Change per Decade in US Occupational Employment Shares for Two Periods: 1940–1980 and 1980–2010



Jobs that aren't substituted by technology

1. "Abstract" jobs: Problem solving, intuition, creativity. Professional, technical, managerial jobs.
2. "Manual" jobs: Adaptability, language recognition, human interaction. Food prep, service, healthcare jobs.

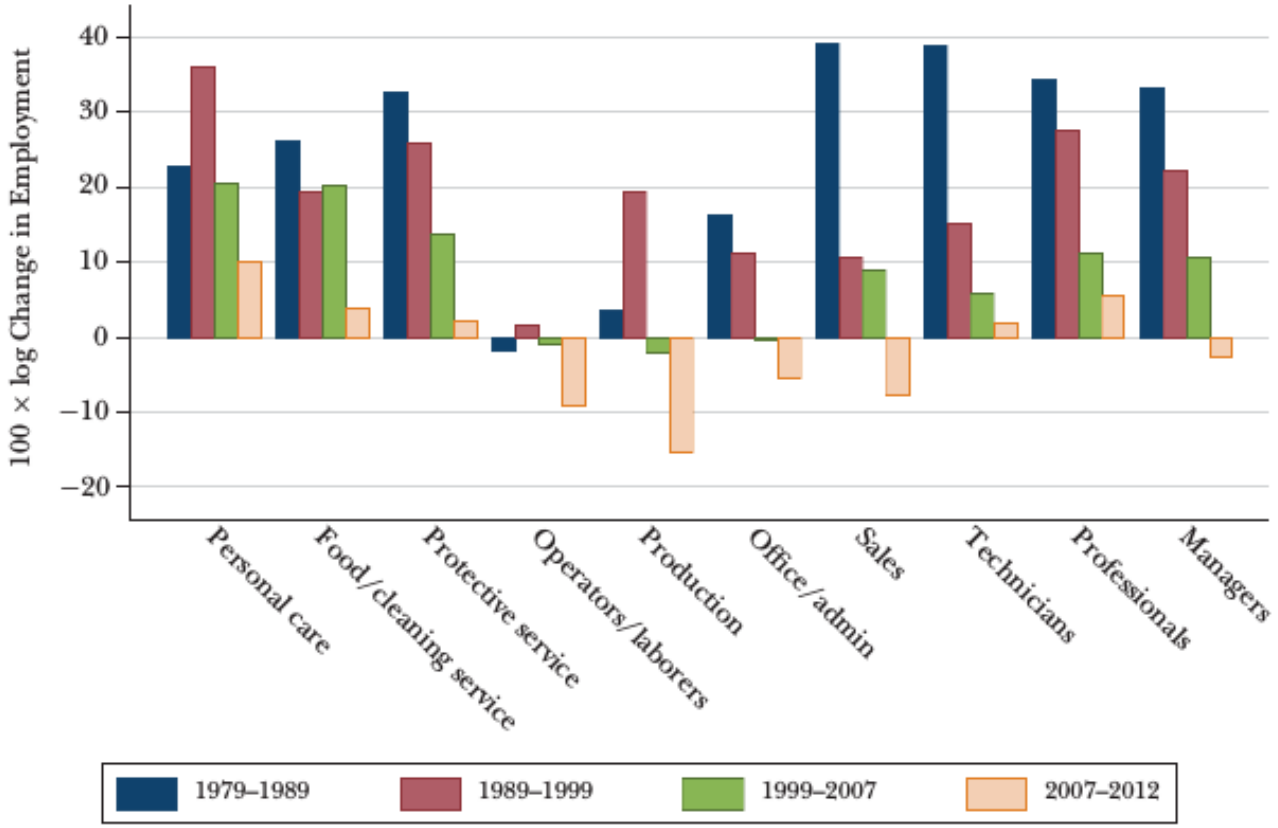
Skills and jobs

- Abstract jobs usually require training and education
- Manual jobs can be learned "on the job", not as much education needed
- Jobs in the middle of the skill distribution are "hollowed out"

Figure 2

Change in Employment by Major Occupational Category, 1979–2012

(the y-axis plots 100 times log changes in employment, which is nearly equivalent to percentage points for small changes)



Technology complements

- Not all jobs benefit the same from technology
- Computer programmers might benefit more from faster computers than bank tellers from ATMs
- Differences in productivities will be reflected in wages
- Which workers are complemented by technological innovations?

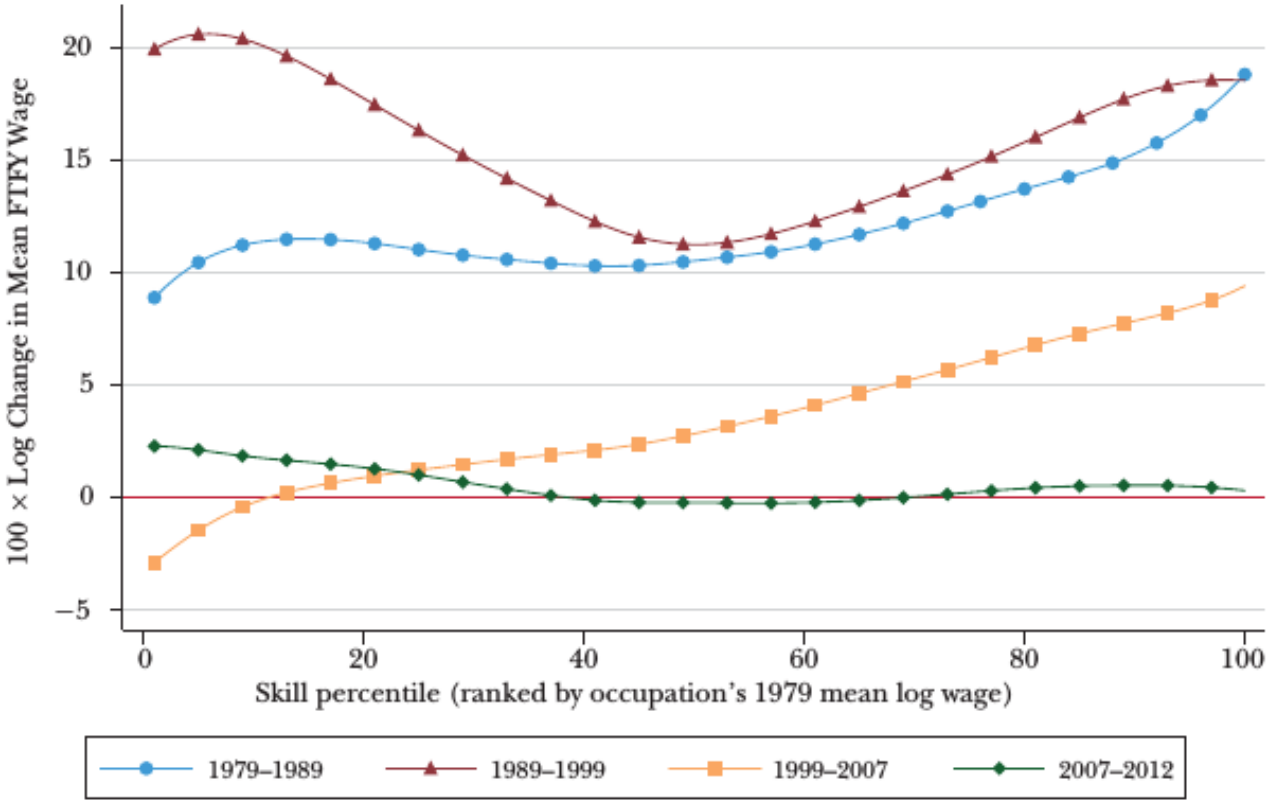
Skill-biased technological change (SBTC)

- Technological advances have complemented high-skilled workers more than low-skilled workers
- Computers allow doctors to diagnose better, lawyers to find laws better, financial analysts to model asset prices better, etc
- We say that technological change has been **biased** toward skilled workers
- Skilled workers receive more benefits from technology than other workers

Figure 4

Changes in Mean Wages by Occupational Skill Percentile among Full-Time, Full-Year (FTFY) Workers, 1979–2012

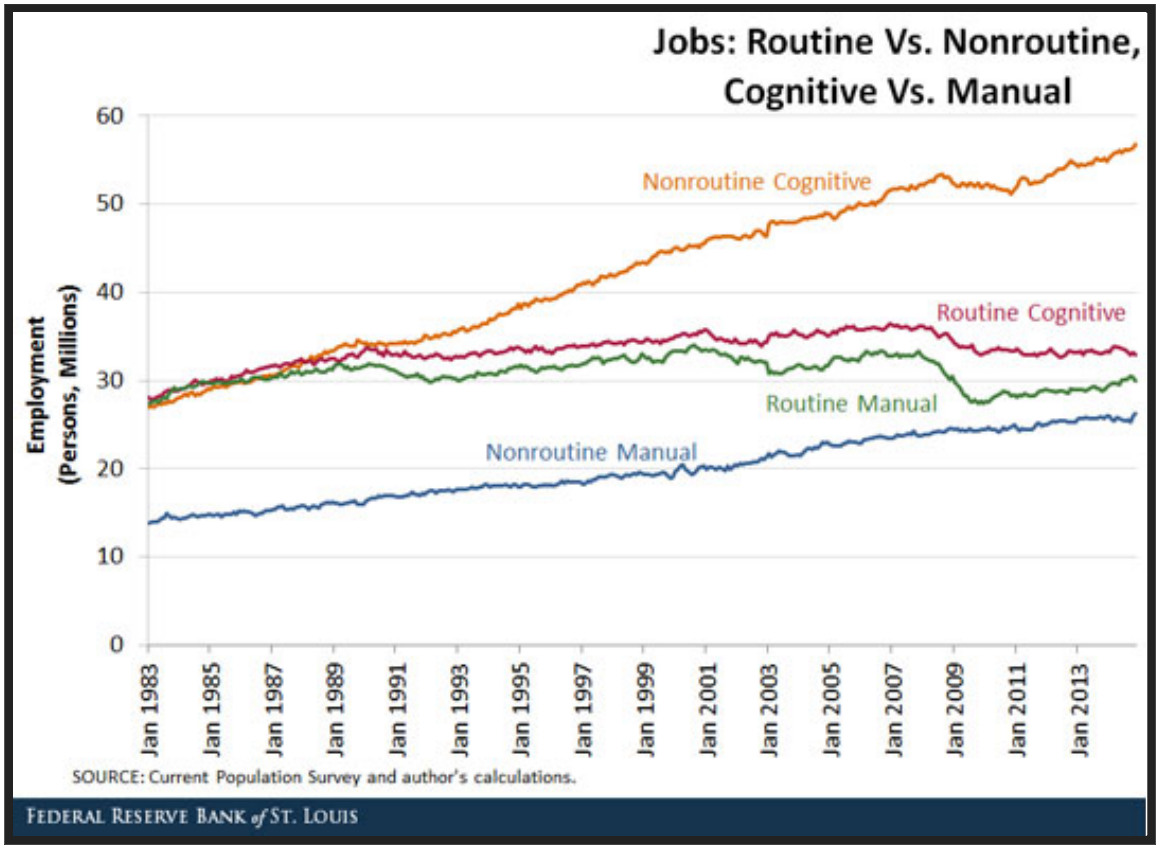
(the y-axis plots 100 times log changes in employment, which is nearly equivalent to percentage points for small changes)



Middle-skill jobs

Break up "abstract" and "manual" jobs into routine and nonroutine categories:

1. Nonroutine abstract: Management and professionals
2. Nonroutine manual: Service, care providers
3. Routine abstract: Sales, support, office
4. Routine manual: Construction, manufacturing, mining


Jobs: Routine Vs. Nonroutine, Cognitive Vs. Manual
Employment (Persons, Millions)
60
50
40
30
20
10
0
Nonroutine Cognitive
Routine Cognitive
Routine Manual
Nonroutine Manual
Jan 1983
Jan 1985
Jan 1987
Jan 1989
Jan 1991
Jan 1993
Jan 1995
Jan 1997
Jan 1999
Jan 2001
Jan 2003
Jan 2005
Jan 2007
Jan 2009
Jan 2011
Jan 2013
SOURCE: Current Population Survey and author's calculations.
FEDERAL RESERVE BANK of ST. LOUIS

Trade and polarization

- Routine jobs are easily outsourced as well as easily automated
- Educated workers oversees compete against domestic workers for routine jobs
- Growth of India and China has greatly increased the supply of foreign workers who can perform routine jobs

Global vs local inequality

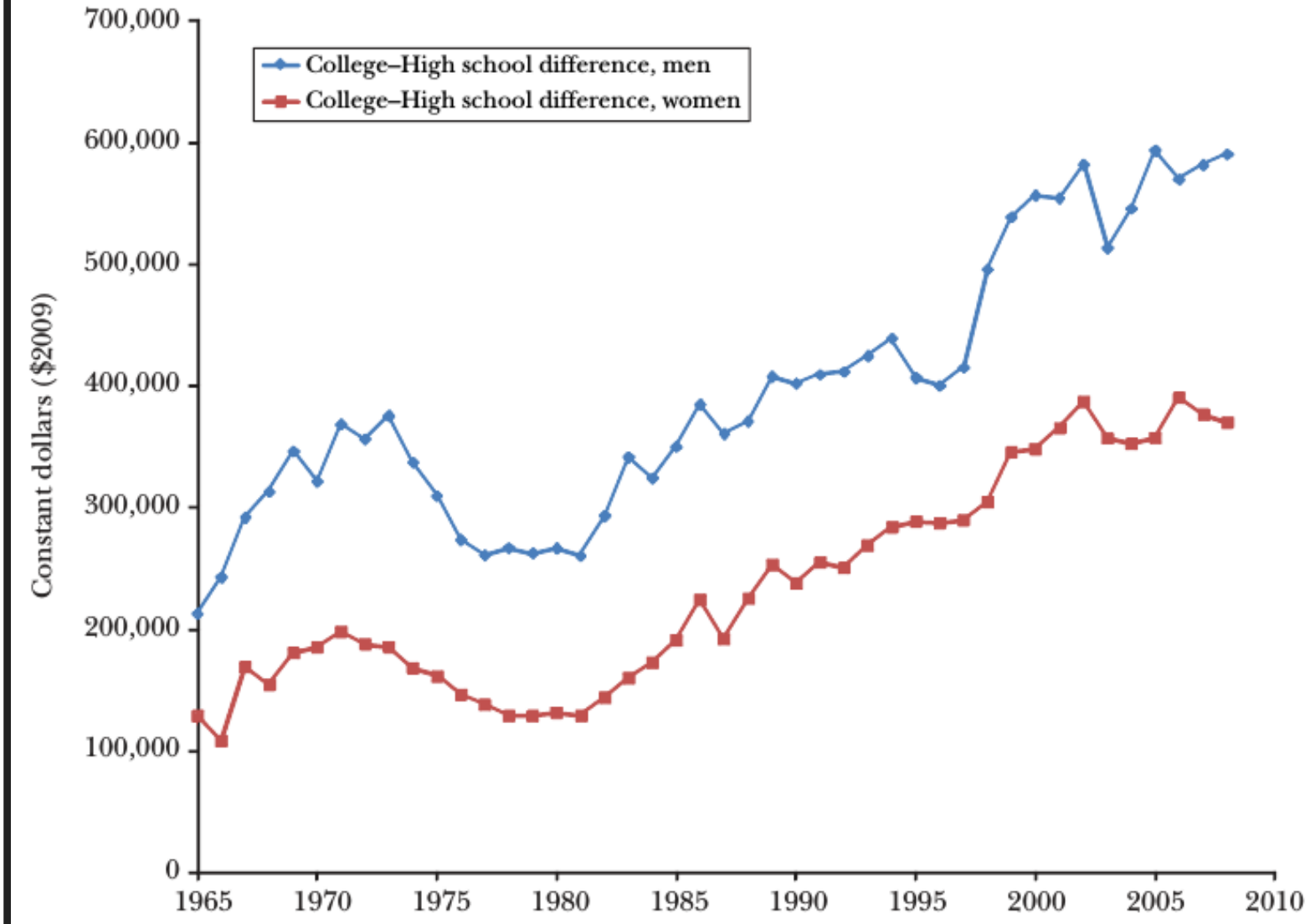
- The rise of China and India has vastly reduced global income inequality
- With growth comes new workers that can compete in global market
- This hollows out middle skill, routine tasks
- Makes inequality increase in developed countries

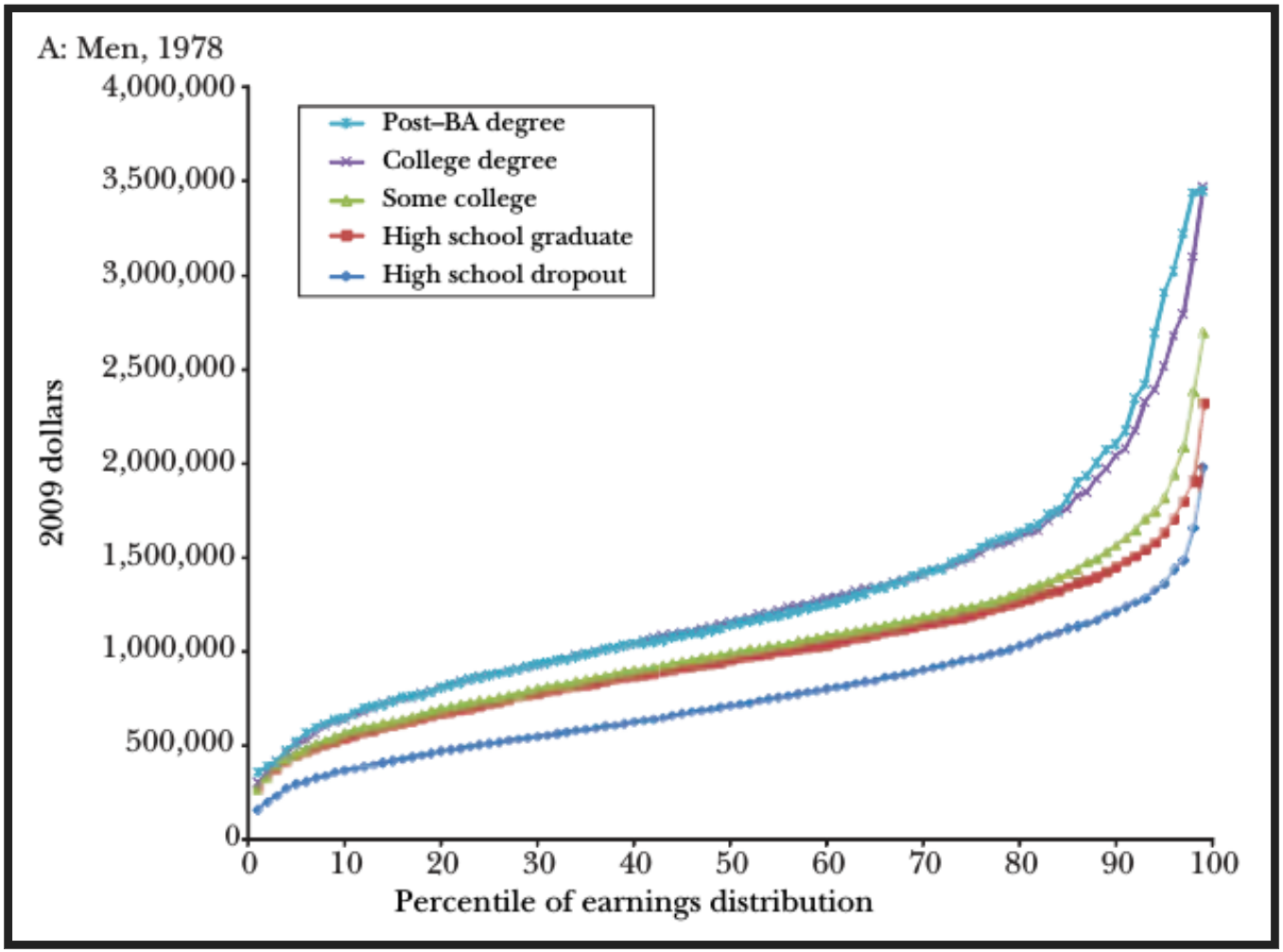
Returns to education

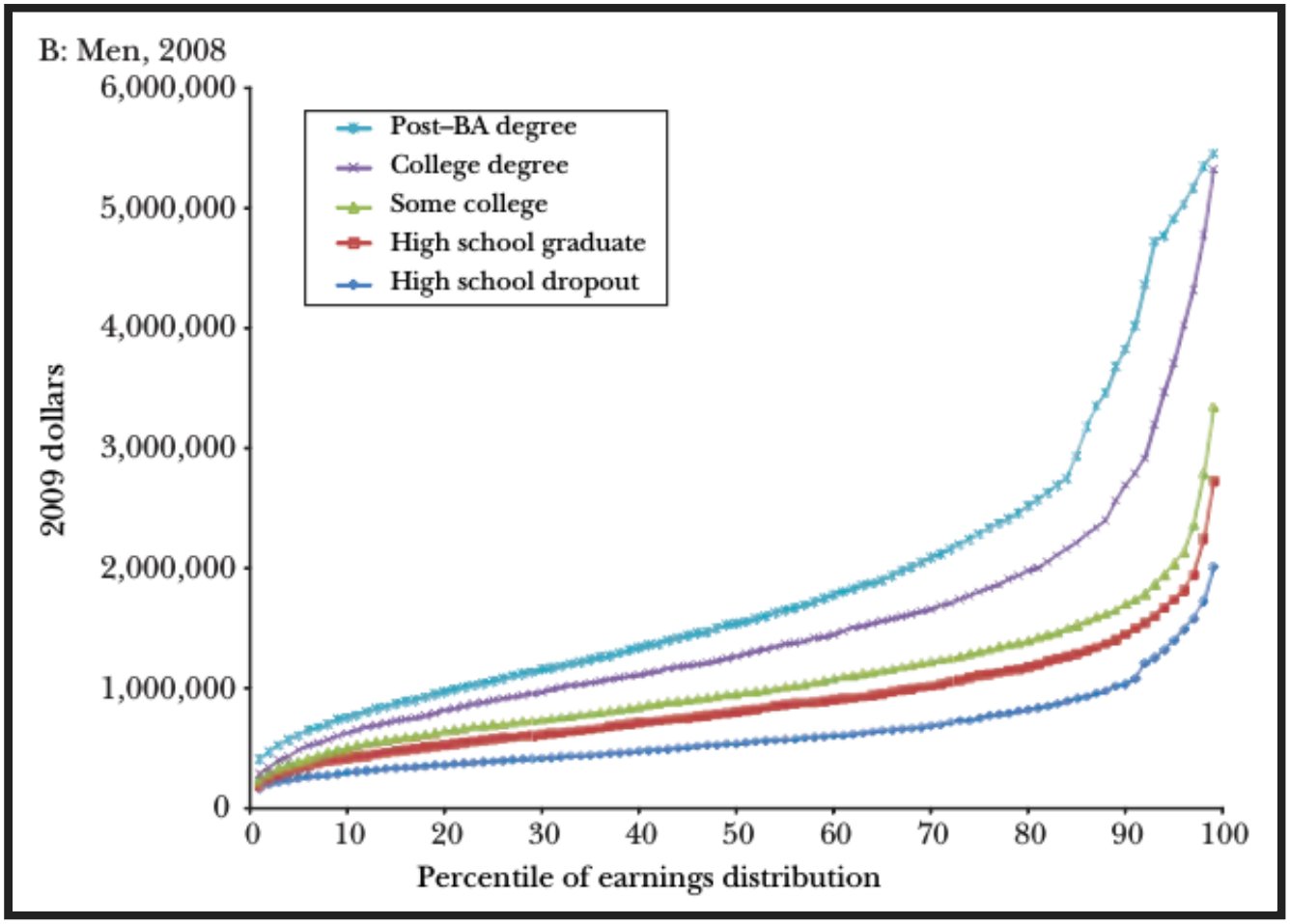
- If returns to education are so high, why doesn't everyone get advanced degrees?
- Returns to education high enough to make student debt "worth it"

Figure 3

Present Discounted Value of College Degree Net of Tuition, 1965–2010




A: Men, 1978
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
2009 dollars
Post–BA degree
College degree
Some college
High school graduate
High school dropout
0
10
20
30
40
50
60
70
80
90
100
Percentile of earnings distribution


B: Men, 2008
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
2009 dollars
Post–BA degree
College degree
Some college
High school graduate
High school dropout
0
10
20
30
40
50
60
70
80
90
100
Percentile of earnings distribution

Credit constraints

- High-income students might have better access to credit markets
- More students are dependent on private student loans in addition to Government loans
- Private loans are often not available to low-income students

Increasing value of leisure time (speculative)

- "The Free-Time Paradox in America", Atlantic Magazine, September 2016
- Low skill, young men work much less today than in the past
- 3/4 of additional leisure time is spent playing video games
- "Life satisfaction" surveys indicate they are just as happy

Consumer surplus and leisure

- Entertainment goods are much cheaper today than in the past
- People are willing to pay high amounts for entertainment, but prices are low
- Internet based goods are very low cost (Wikipedia, Netflix, Facebook)
- The same level of income can buy more utility (satisfaction)
- Some people might be less willing to work hard to become rich (marginal utility of income is lower)

Summary

- Automation and trade replace jobs that require some skill
- High skill and low skill jobs not replaced by automation or trade
- Technology is "biased" toward high-skilled jobs, increasing wages
- High skilled and low skilled workers are pulled apart
- Some low skilled workers might be content to not acquire skills (speculative!)