When capitalism works, and when it doesn't

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There are many ways an economic system can work well or badly

- Does it cause economic growth?
- Does it generate high or low levels of inequality?
- Do the benefits of growth trickle down to everyone?
- Does the system destroy the natural environment?

Here I focus on growth and distribution

- In the leading capitalist economies in the last 400 years, capitalism has brought growth
- But it has not always been inclusive growth
- I focus on the labour market
  - Sometimes the average wage has risen in step with output per worker GOOD!
  - Sometimes the average wage has not increased and wage inequality has also risen BAD!
- Why?

There is feedback between the labour market and technical change

- High wages create incentive for the invention and use of capital intensive technology to save labour
  - Value of labour saved by machine must be greater than the extra costs of using the machine
  - High wages raise the saving in labour cost and encourage mechanization
- Mechanization can affect labour market
  - Large job losses for workers using old method
    - Can they be reabsorbed?
  - Falling wages for workers with old skills, rising wages for workers with new skills

Joseph Schumpeter wrote that

- Capitalism caused a ‘perennial gale of creative destruction’. Newly invented production systems destroyed the old systems as they created the new ones.
- Schumpeter overstated his case: sometimes the gale blew strongly, sometimes there was only a gentle breeze
- We follow these changes over the past 400 years.

I focus on the last 400 years which show alternating periods of gale and breeze. Productivity always rose. Wages could lag.

- Pre-industrial revolution, 1620-1770
  - Wages rose
- Industrial revolution, 1770-1850
  - Average wage stagnated, wage inequality rose
- The Industrial Age, 1850-1973
  - Average wage rose
- The Service Revolution, 1973-2020
  - Average wage flat, wage inequality rose

I focus on the lead economy—First Britain, then USA

Pre-industrial Revolution

- Based on hand technology, people worked in their houses or small work shops
- This was the cottage mode of production
- ‘Gale of creative destruction’ was weak!

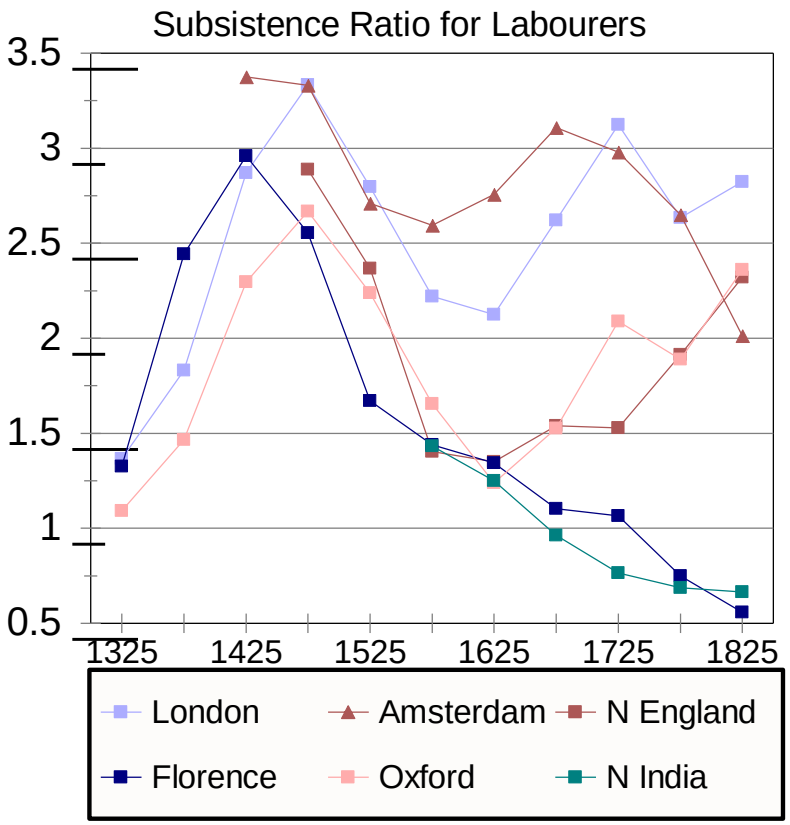
Globalization led to a British export boom

- European states created world empires after 1492 and 1498
- Spain and Portugal were early winners but economic gains were limited
- Dutch and English had best empires that generated demand for manufactures
  - England had many sugar colonies, future USA, India
  - By 1776, population of future USA was one third British and had higher average income.

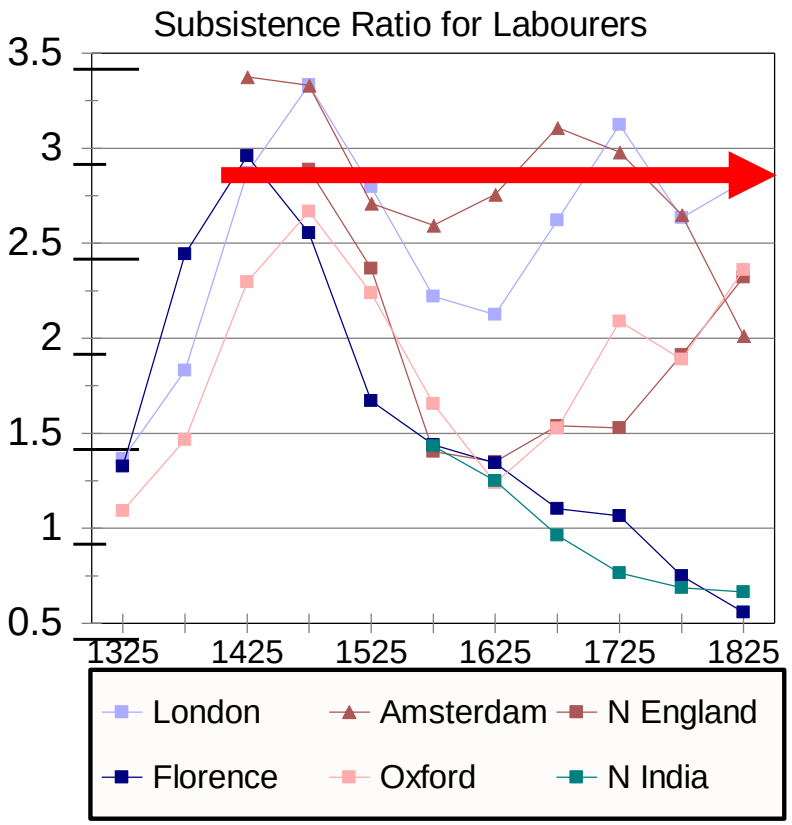
The economy expanded to meet colonial demand

- Mercantilism meant that only Britain could supply colonies.
- London grew from 50 thousand in 1500 to one million in 1800—trade and manufacturing
- Urbanization rate went from 7% to 29%
- Rural non-agricultural economy went from 18% to 36%.
- Agriculture dropped from 75% to 35%.

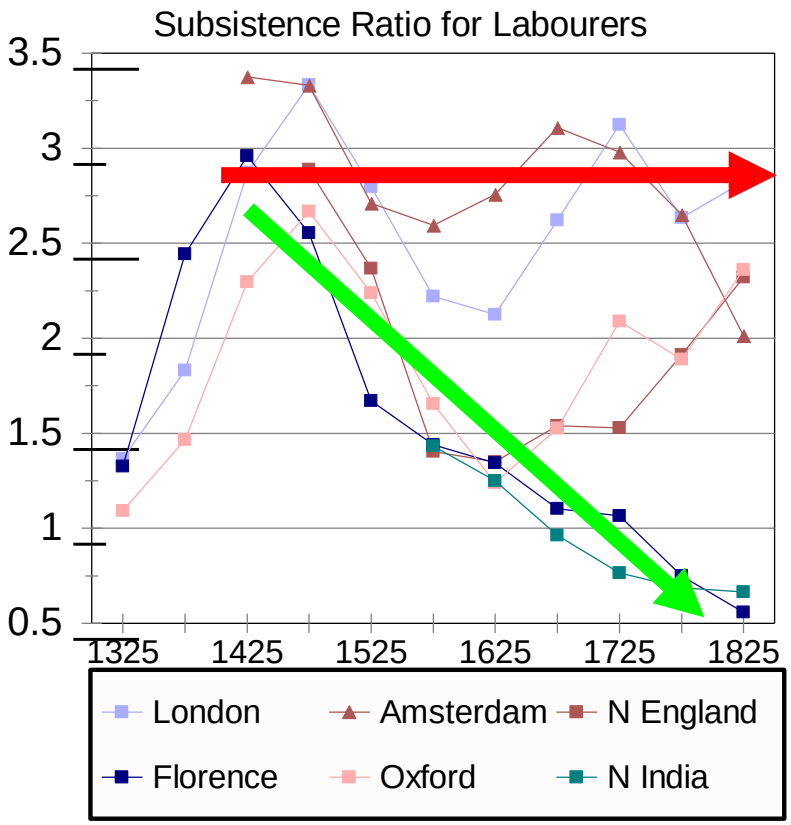
Wages in Europe diverged before the IR



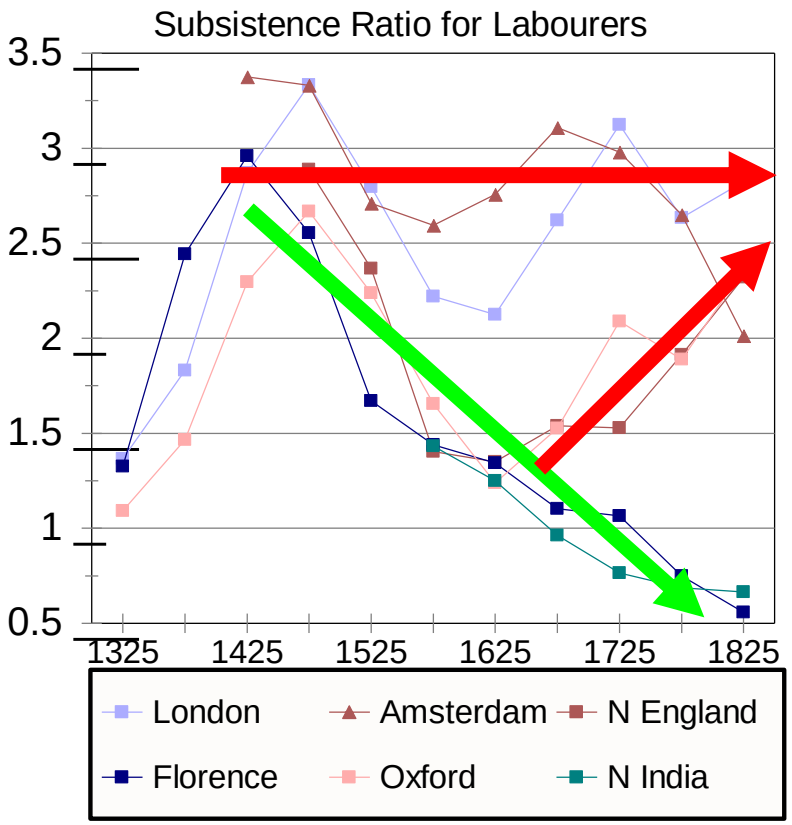
London and Amsterdam had (roughly) constant and high real wages due to booming trade:



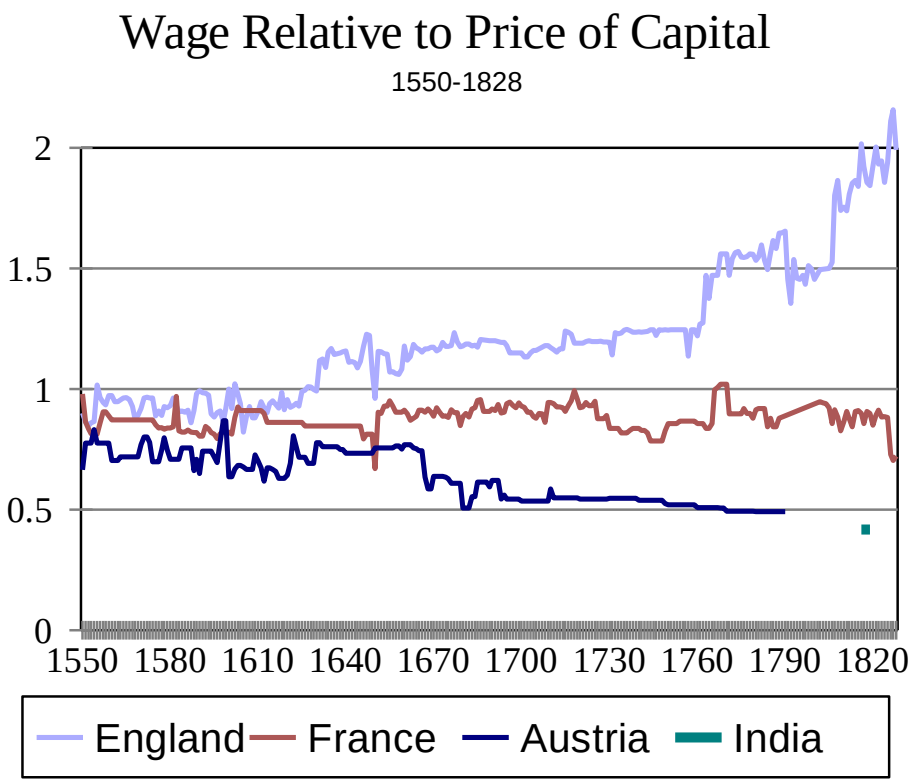
While wages elsewhere dropped below one:



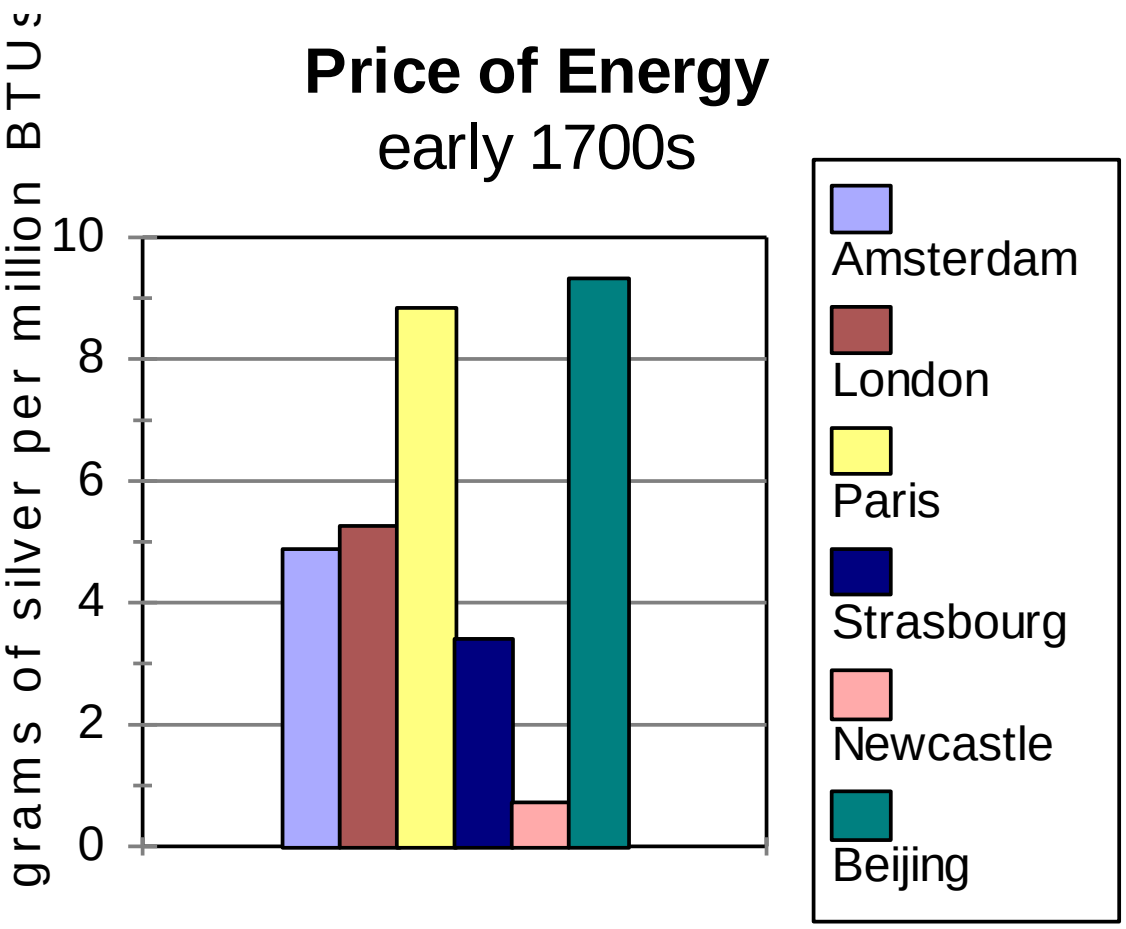
But England bucked that trend as cottage mode expanded!
Economy was working well—workers were gaining.



Factor price view: England was a high wage, cheap energy economy.

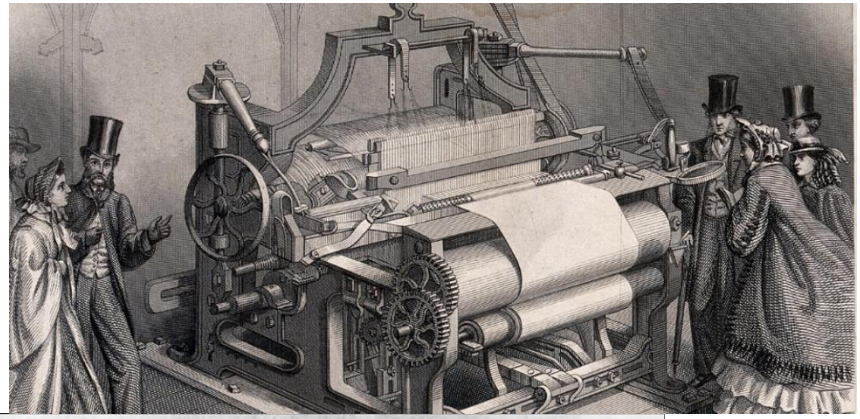


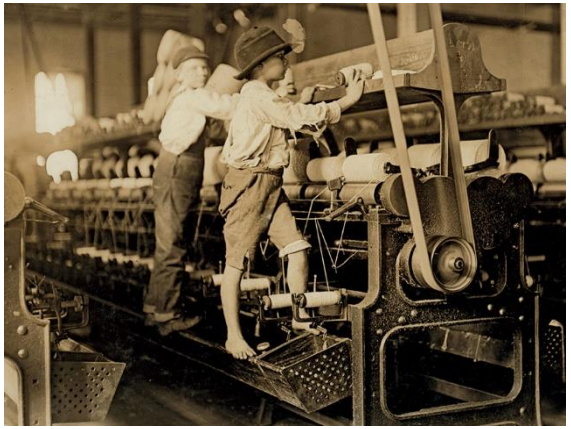
The growth of London led to the English coal industry, which gave northern Britain the cheapest energy in the world.

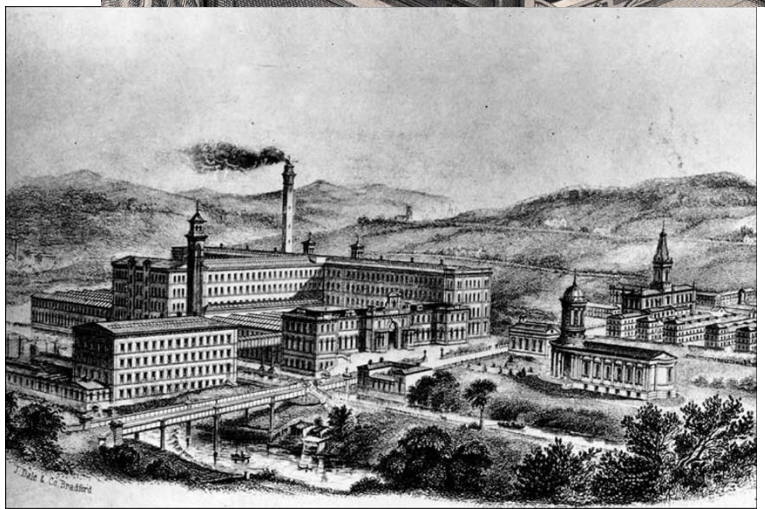


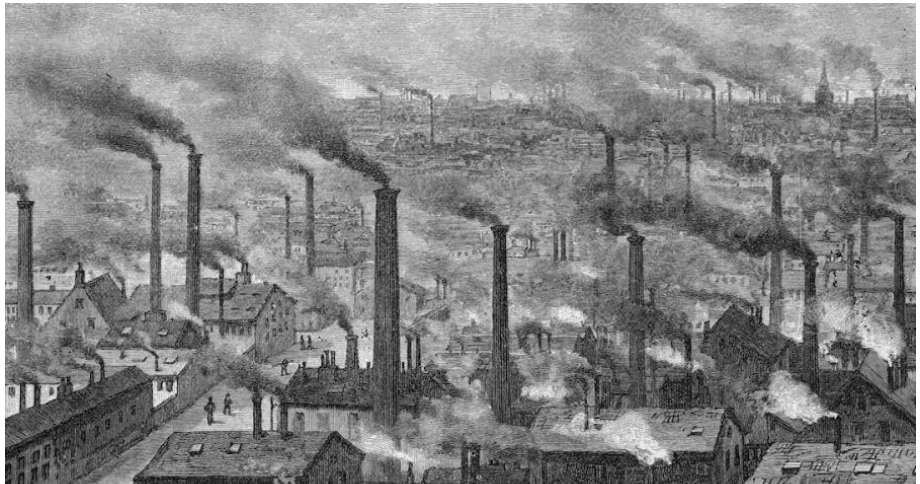
Phase 2: Industrial Rev, 1770-1867

- In response to the high cost labour, machines were invented to mechanize production.
- Factories replaced cottage production.
- Gale of Creative Destruction blew strong!

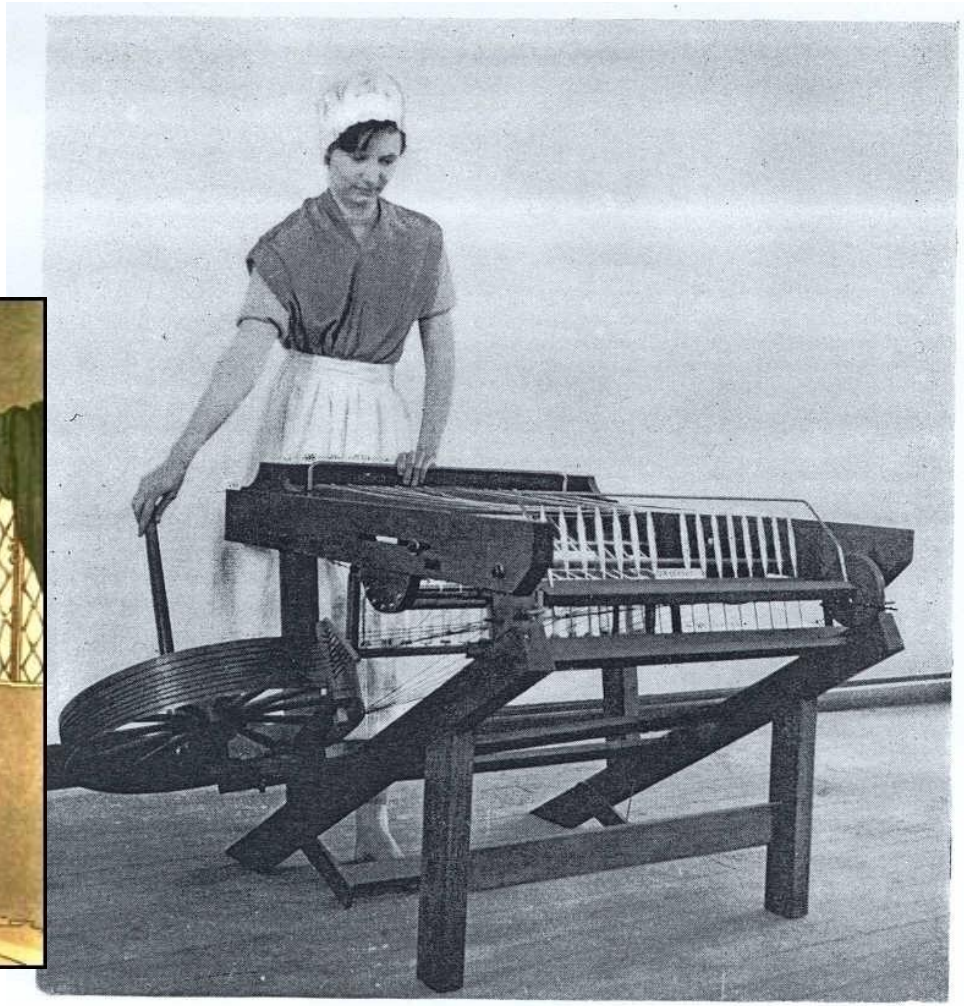




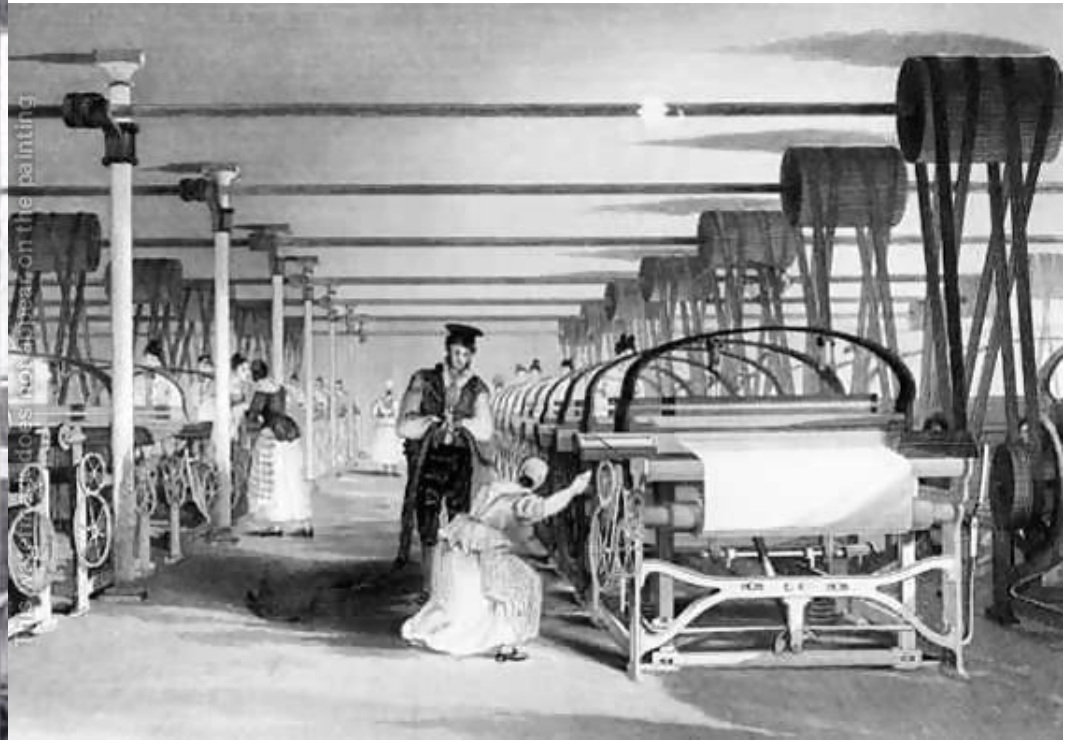




James Hargreaves invented the spinning jenny in the 1760s, and it became the dominant technique into the 1780s.



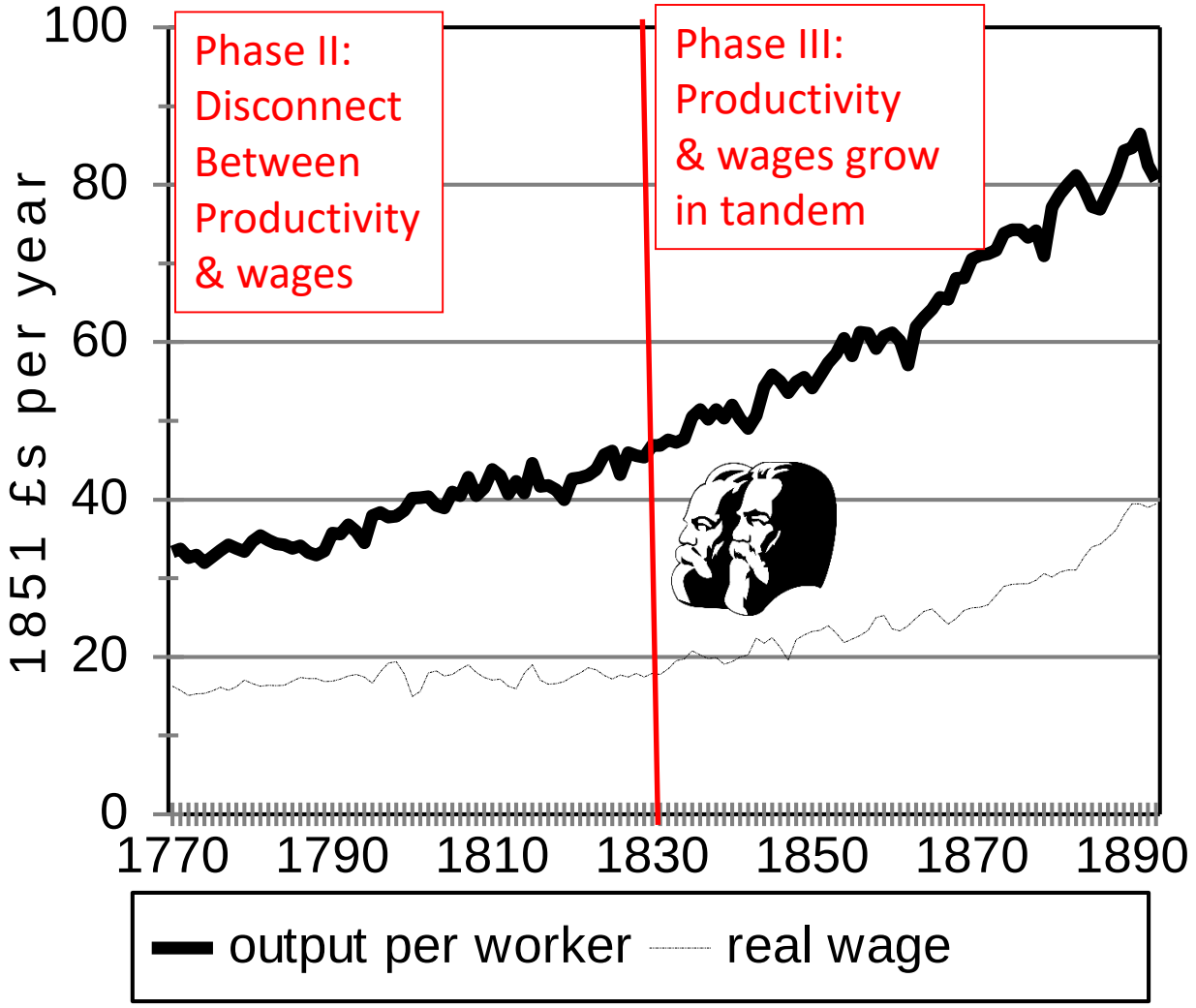
Cloth was woven by hand in cottages until early 19th century when power loom was invented.



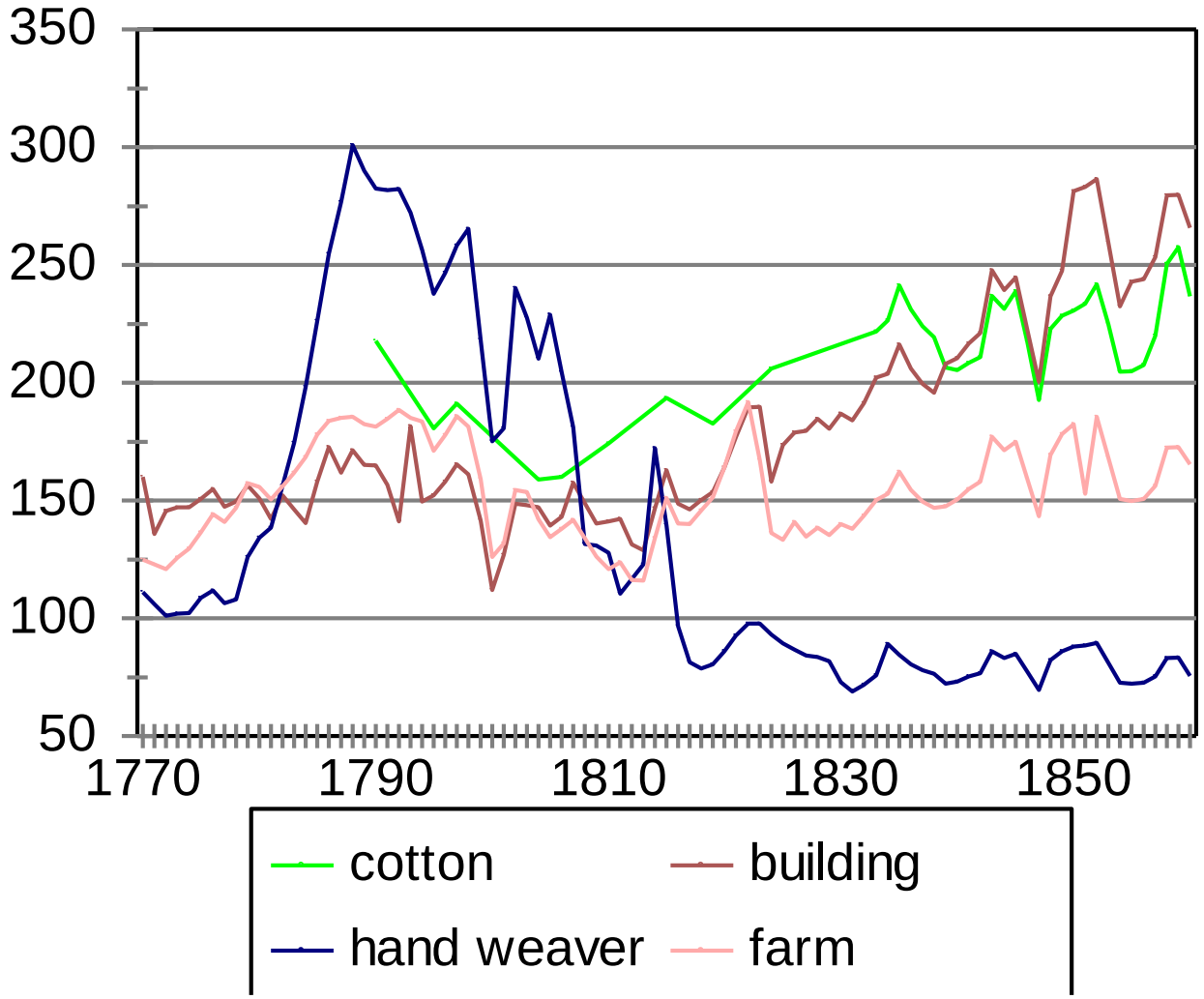
The IR was creative destruction in action

- New machine technology was invented and it raised productivity—creative!
- But the cottage mode of production was destroyed by the factory and many workers lost their jobs and became very poor—destruction!
  - The first group to suffer mass unemployment from new technology were the women who spun in their cottages. The loss of those earnings led to widespread rural poverty.

How did technical progress affect wages?
For a long time only capitalists gained



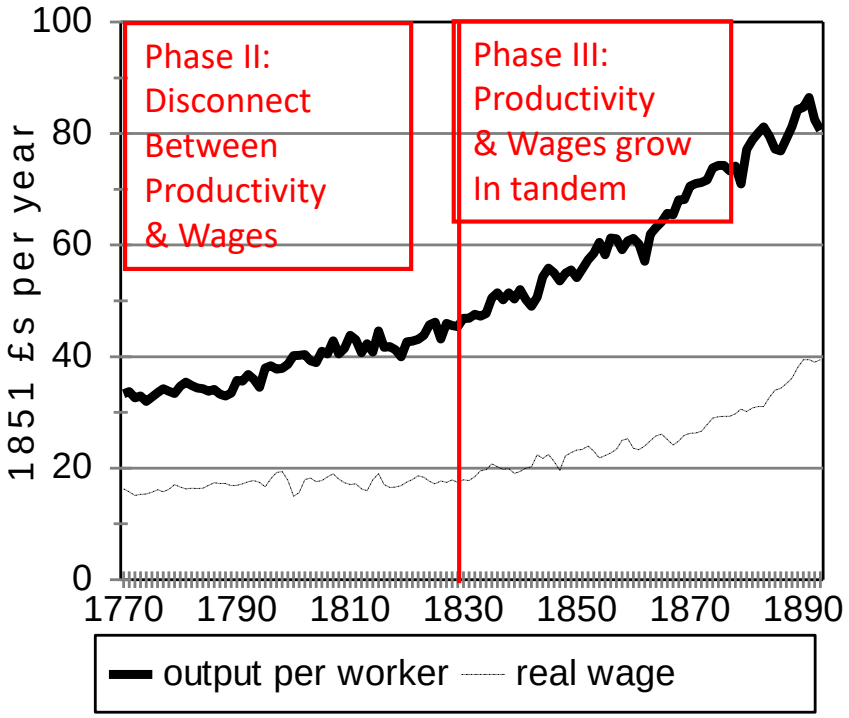
Wage inequality exploded as handicraft workers lost out



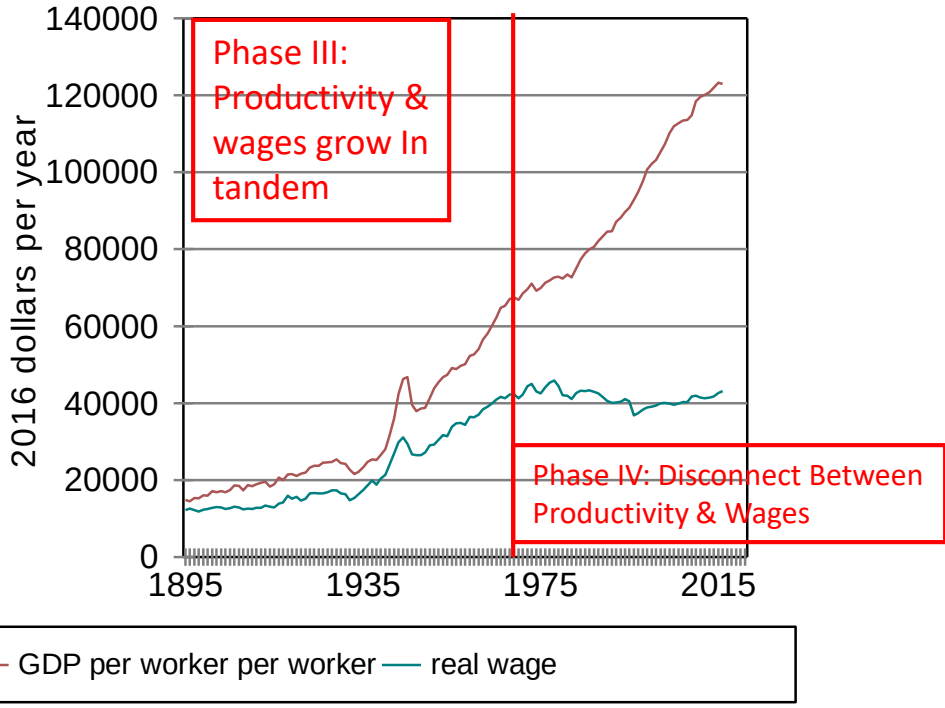
Phase III: Industrial Era, 1867-1973

- USA is world economic leader
- Industry was big share of economy.
- Steady rise in Industrial output in UK & USA
  - Britain had empire, USA had the West
- Output per worker and real wage rose
  - Economists' optimism is generalization of this period
- 'Gale of perennial destruction' weak
- Factory jobs were basis of mass prosperity in West

Wages versus profits: British and USA experience



British history



American history

The sources of invention expanded

- The development of science meant that universities and research institutes became sources of technical knowledge
  - Links between universities and industry
    - Stanford University & Silicon Valley was not the first.
- Mission oriented research
  - Institutes to solve problems in agriculture, health, etc were formed
  - Military research is an important example
    - All key systems in smart phones are applications of technology developed with US military contracts.
- These sources led to new products

Businesses always tried to lower production costs & this led to more capital per worker

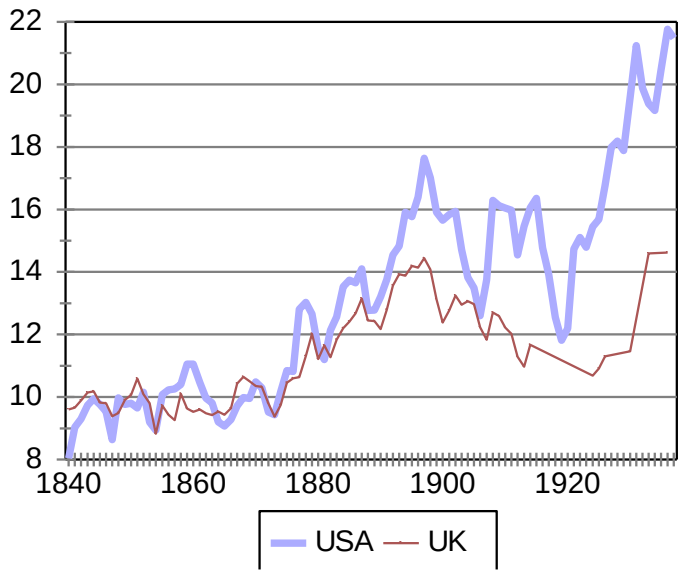
- High wages provide incentive to invent more mechanized technology.
- More mechanized technology raised wages.
- High (and growing) levels of education aided pure and applied research.
- Over time Western technology became larger scale and more capital intensive.
- Much of this technology is not cost effective in poor countries.

We can specify the problem better by distinguishing skilled from unskilled work

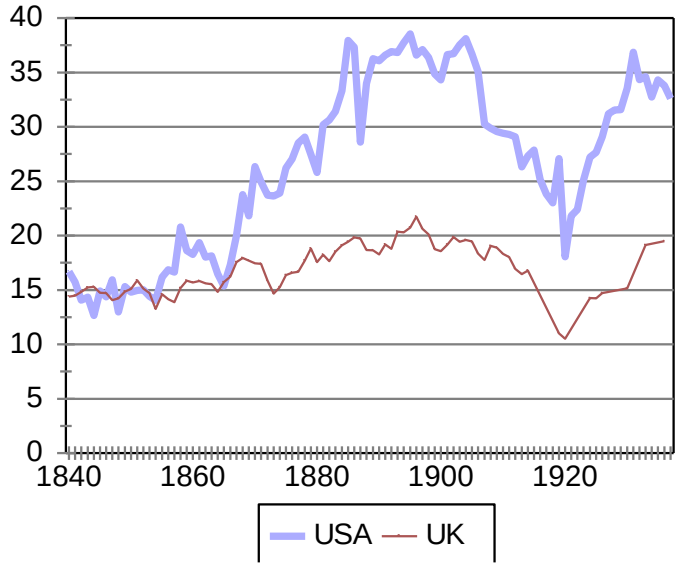
- Some industries employed many unskilled labourers
  - In 1910 blast furnaces & steel works employed 194,320 labourers out of 401,039 employees
- Other industries employed mainly skilled workers
  - Automobiles 15,022 labourers out of 105,758
- Different strategies required
- Over time, in both cases, the skilled and unskilled were replaced by semi-skilled operators with routinized jobs

Wages rose relative to capital costs—especially skilled labour in USA

Unskilled wage/price capital services



Skilled wage/price capital services



Why the differences?

- Huge expansions in both countries led to rising demand for both skilled & unskilled labour
- In USA, skilled wages were bid up, but mass immigration of European farm workers put a lid on unskilled wages (globalization of labour market).
- In UK, abundant skilled labour was a legacy of IR, and there was no immigration of unskilled farm workers.

What to do about expensive unskilled labour? Scientific management (Taylorism) was one answer.

"Handling pig iron…is chosen because it is typical of perhaps the crudest and most elementary form of labor which is performed by man. This work is done by men with no other implements than their hands. The pig-iron handler stoops down, picks up a pig weighing about 92 pounds, walks for a few feet or yards and then drops it onto the ground or upon a pile."

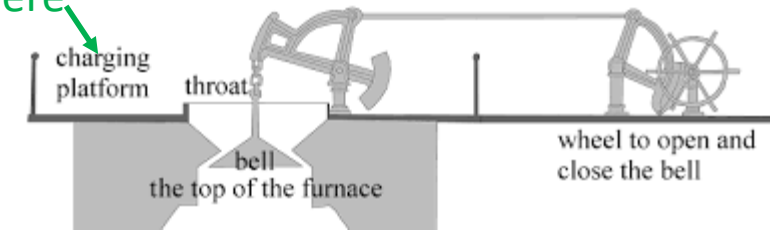
At the Bethlehem Steel Co in 1898 a gang of pig-handlers "were loading on the average about 12-1/2 long tons per man per day. We were surprised to find, after studying the matter, that a first-class pig handler ought to handle between 47 and 48 long-tons per day."

A German immigrant named Schmidt is selected and offered $1.85 per day instead of the usual $1.15 if he will load 48 tons per day. "You will do exactly as this man tells you tomorrow from morning till night. When he tells you to pick up a pig and walk, you pick it up and you walk, and when he tells you to sit down and rest, you sit down…And what's more, no back talk."

Another solution: mechanize material handling

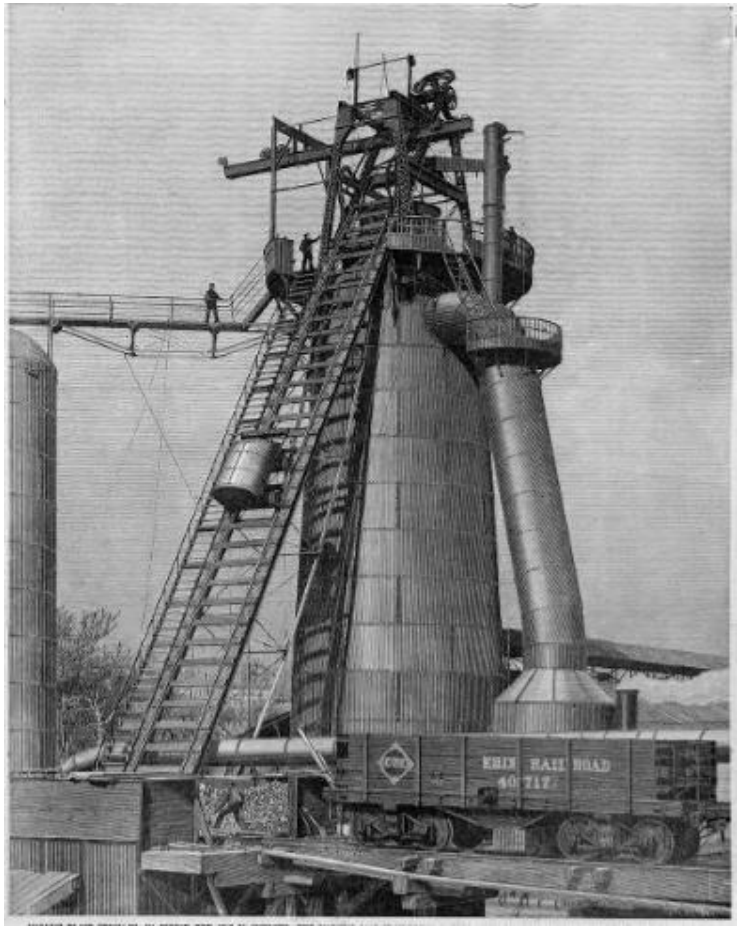
Man with Wheelbarrow Stands here

Old: Hand Charging



Max Meadows Furnace, 1891

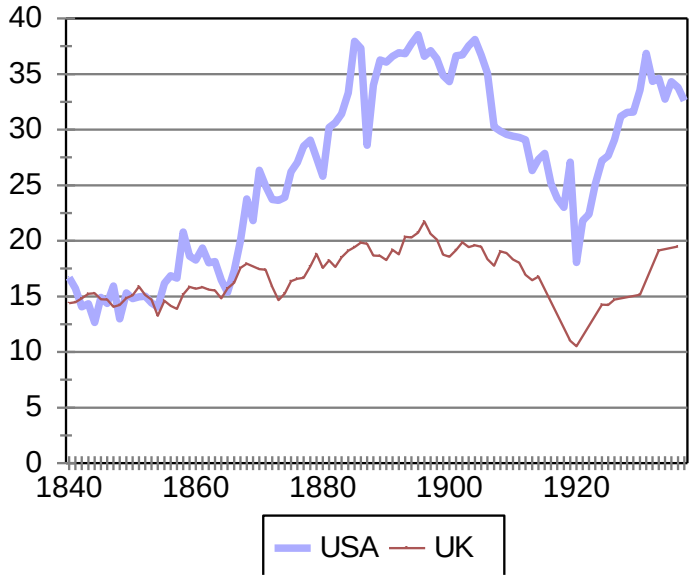
New: Skip hoist



Edgar Thomson Works 1903

Much greater incentive to substitute capital for skilled labour in USA

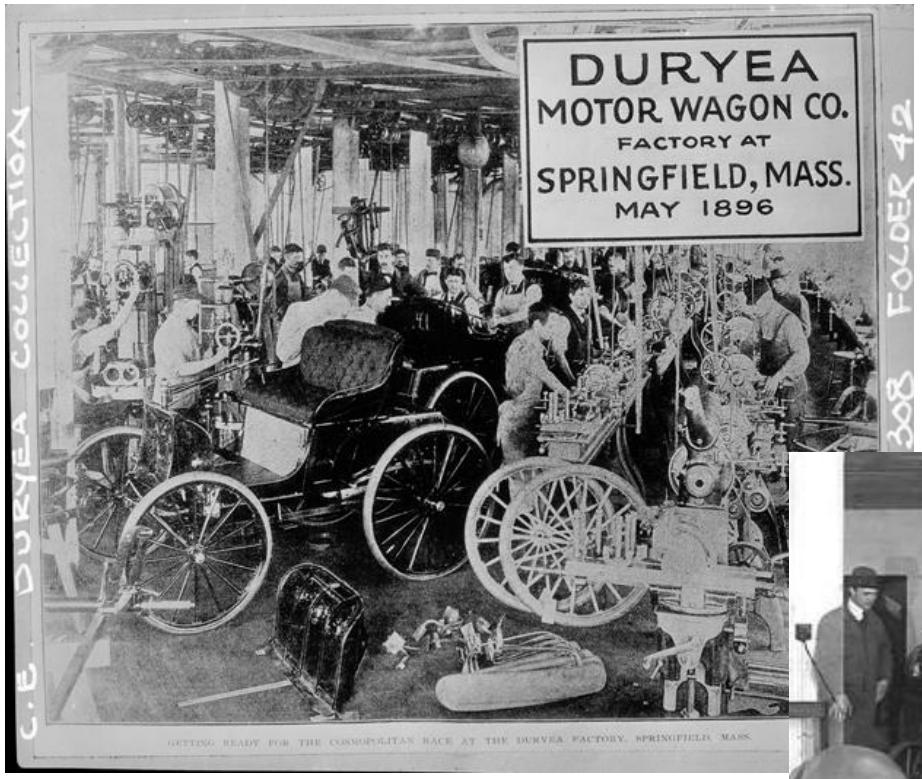
skilled wage relative to user cost of capital



- Henry Ford's solution was the invention of mass production

We tend to see the assembly line as Ford's great innovation

Auto assembly before the assembly line:



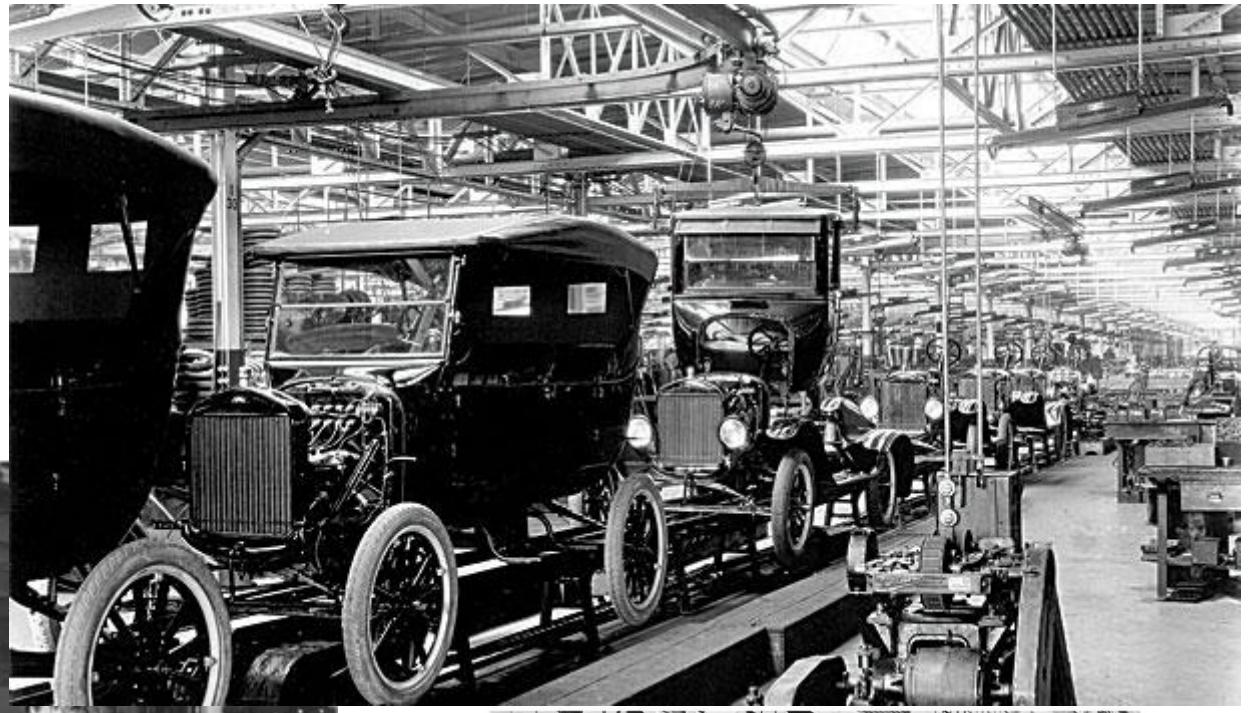
Parts are brought to car

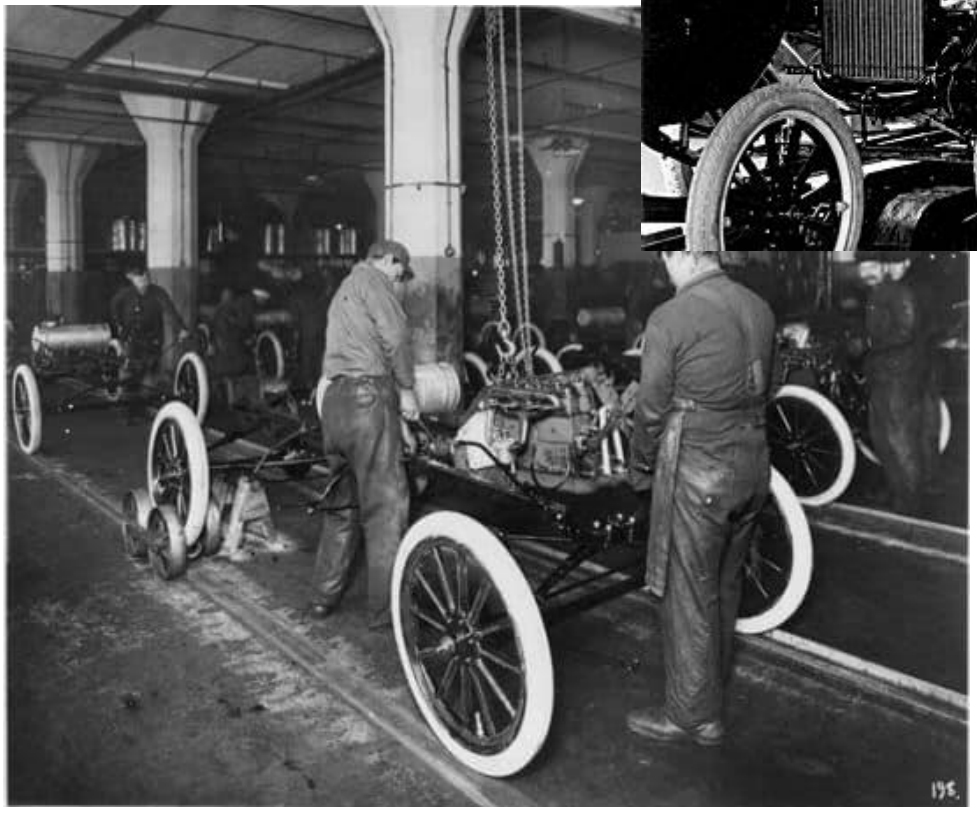
Watrous automobile Company

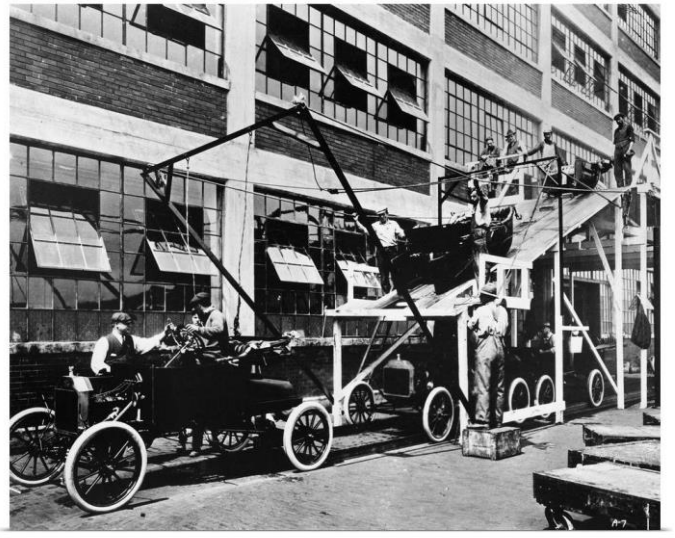
Ford's Highland Park Assembly line

Car is brought to parts

Assembly lines reduce the number of labourers by moving materials







Ford's most far reaching invention was the 'semi-skilled' worker

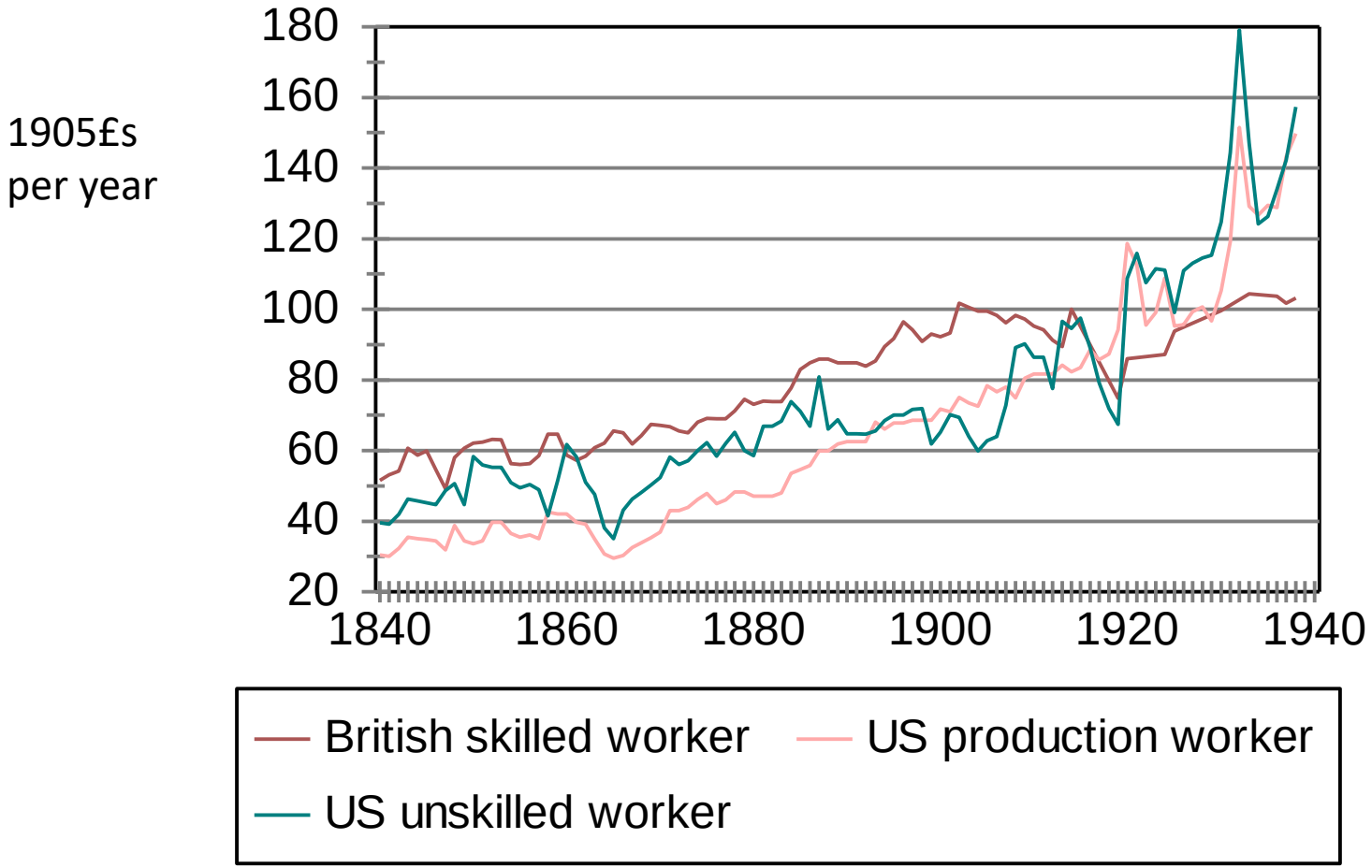
- Skilled machinists planned the work as well as performing it.
  - Where exactly does the hole go? How deep?
  - Immigrant farm workers could not do this.
- Ford replaced all the general purpose machine tools with specialized tools pre-set so no thinking was required.
  - Tools with jigs, fixtures, and stops eliminated skilled labour and allowed the employment of cheap immigrant farmers.
- The semi skilled worker was born.

The old time tool hardener was an expert. He had to judge the heating temperatures...The wonder is that he hit it so often...We introduced a system by which the man at the furnace has nothing at all to do with the heat. He does not see the pyrometer–the instrument which registers the temperature. Coloured electric lights give him his signals. (Ford 1922, chapter 6).

Fordism was applied to office work

- Scientific management required management to monitor worker performance, hire and discipline workers, measure costs.
- This created jobs for women as clerical workers
- Universal high school instead of skills training
- Data processing—punched cards and Hollerith's Electrical Tabulating Machine
  - Clerical worker with a routinized job
  - Not adopted in India since labour is so cheap (like spinning jenny)!

US production workers overtook British skilled workers to create American 'middle class'!



Two factors contribution to the rise of the American middle class:

- Cessation of mass immigration after WWI led to decline in skill premium and rise in wages of unskilled labourers and production workers.
- Mass organization of trade Unions in 1930s cemented these gains and carried them forward.

Did Henry Ford say it all?

"I have heard it said, in fact I believe that it's quite a current thought, that we have taken skill out of work. We have not. We have put a higher skill into planning, management, and tool building, and the results of that skill are enjoyed by the man who is not skilled."

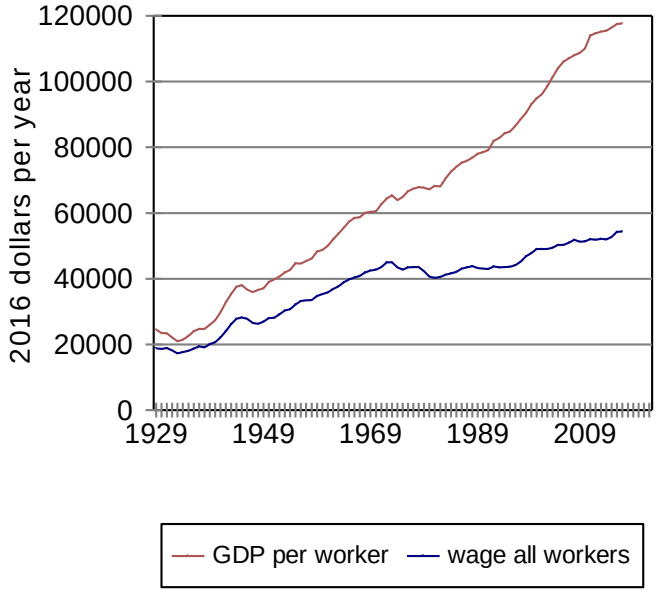
- The creation of routinized factory and clerical jobs was important for the future since routinized jobs were the kind of jobs that could be taken over by robots and computer systems.

Phase IV: The Service Revolution, 1973-2020

- We are now in an era like the Industrial Revolution
- Globalization, technical change, new economic arrangements threatened the old patterns and expected outcomes.
- What's going on?

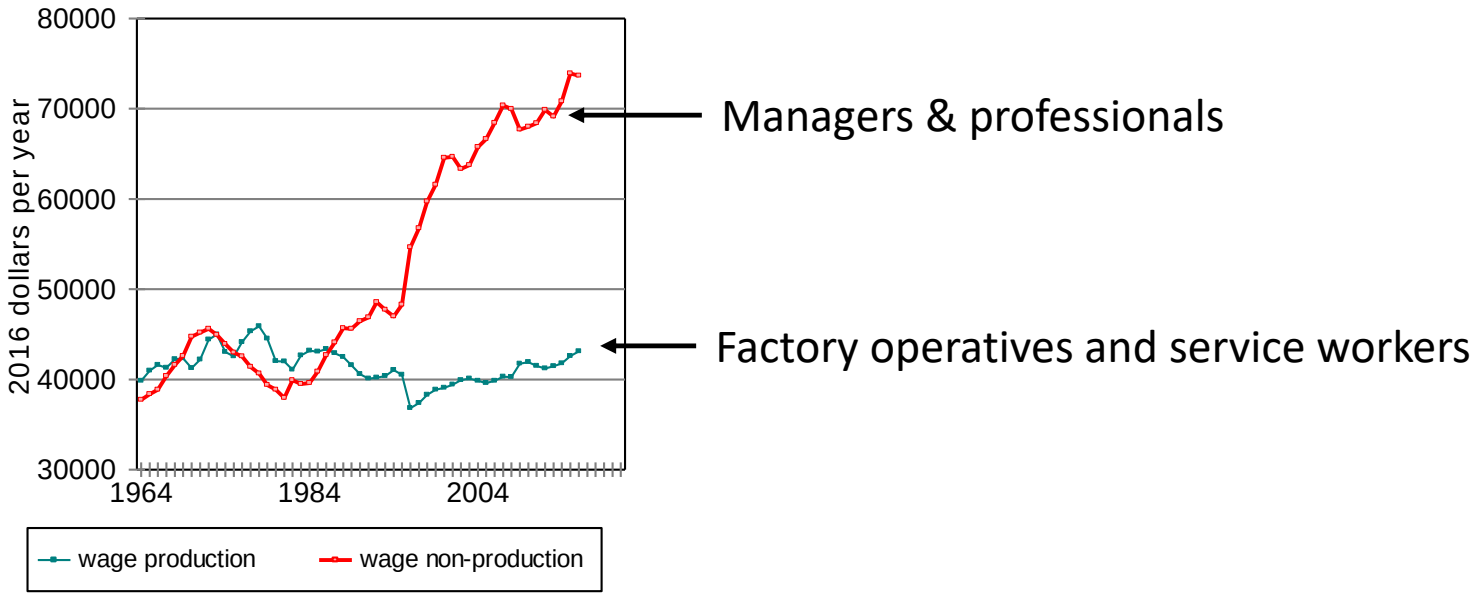
The problem

- Output per worker rising, but…
- Average wage is almost flat
- Labour's share of total income is falling



Moreover, wage inequality has also been increasing

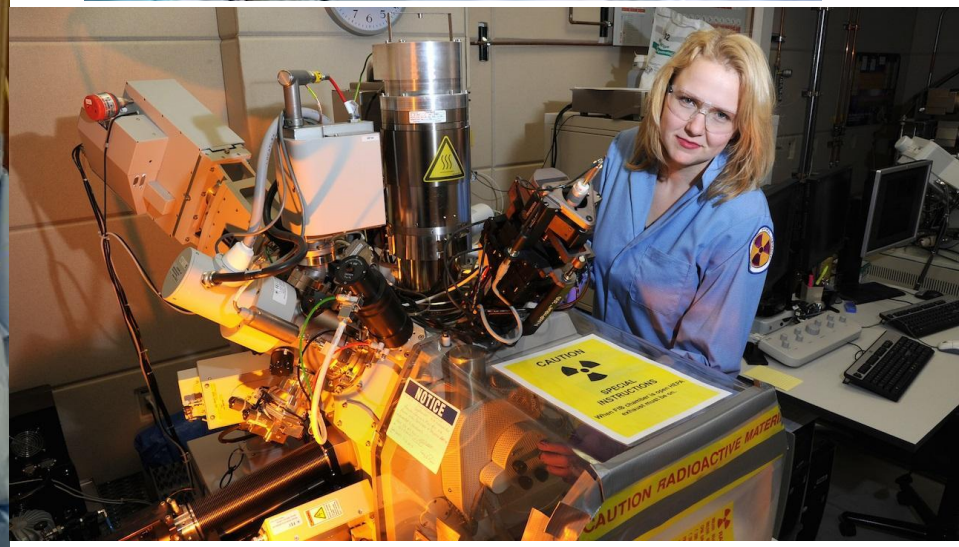
- US labour force divided into ‘production and non-supervisory workers’ and everyone else:



Employment trends are different for these groups:

- Managers & professionals = up a lot
- Craft and semi-skilled workers = down a lot
- Other service workers = up a lot
  - By service workers, I refer to occupations like cleaners, delivery personnel, waiters, car park attendants, cooks, guards, retail clerks, nurses aides, etc, all of whom are poorly paid.

High paid managers & professionals

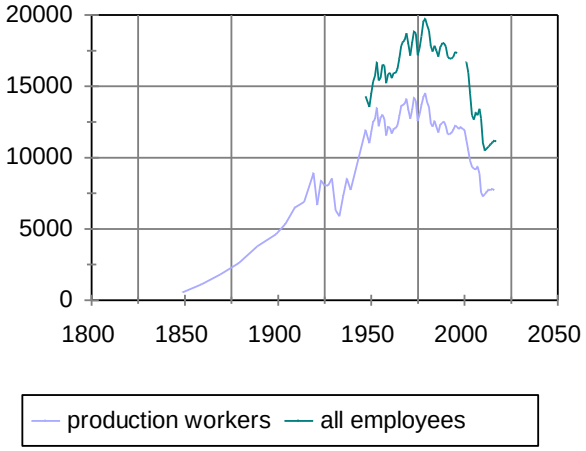


Low paid service jobs

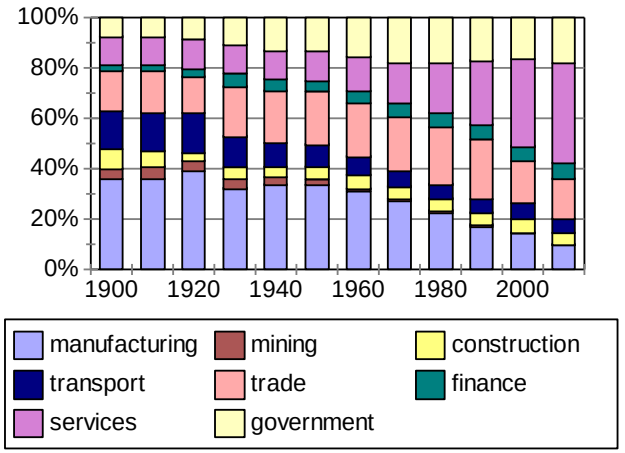
No longer so well paid factory workers

Employment shifts are related to decline in manufacturing

Employment in US Manufacturing (000s)



Structure of US non-farm economy



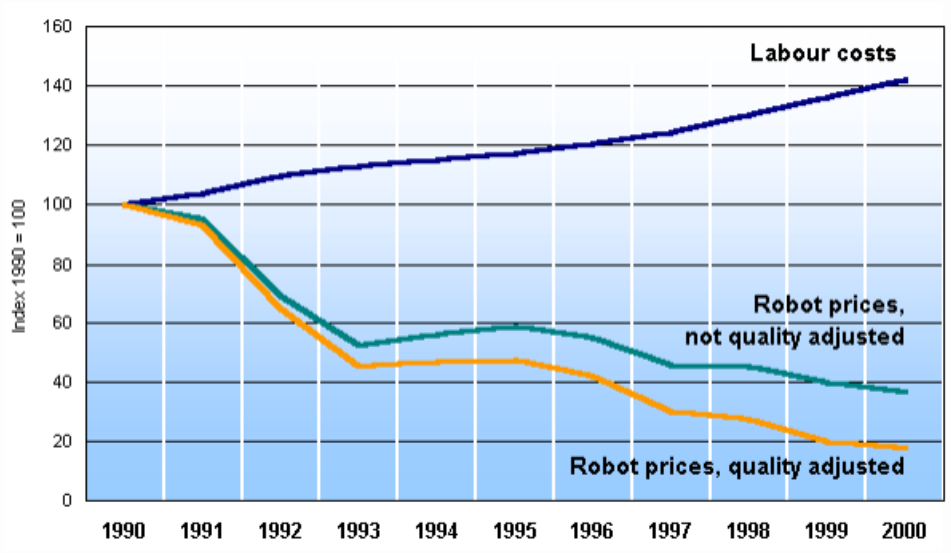
Is globalization the cause?

- Many blame Chinese imports.
- These have been important in last twenty years, but much of the decline in manufacturing employment preceded that.
- Industries like leather, textiles, apparel were wiped out by imports
- Industries like primary metals, non-electrical machinery, paper, printing & publishing had 10% or less import penetation and 50-75% employment falls

What about technical change and robots?

- More capital per worker raises output per worker
- Price of capital is falling relative to labour, and this makes mechanization more profitable.
- Huge falls in price of robots mean this happens even with slow wage growth

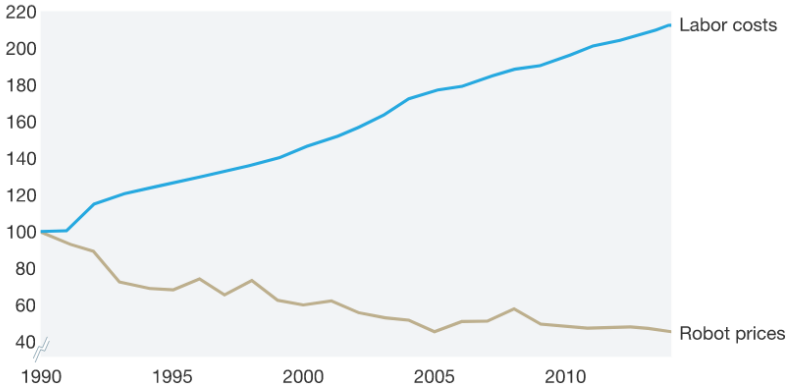
Estimated price index of industrial robots in the United States, with and without quality adjustment. Index of labour compensation in the US business sector



Robot prices have fallen in comparison with labor costs.

Cost of automation

Index of average robot prices and labor compensation in manufacturing in United States, 1990 = 100%



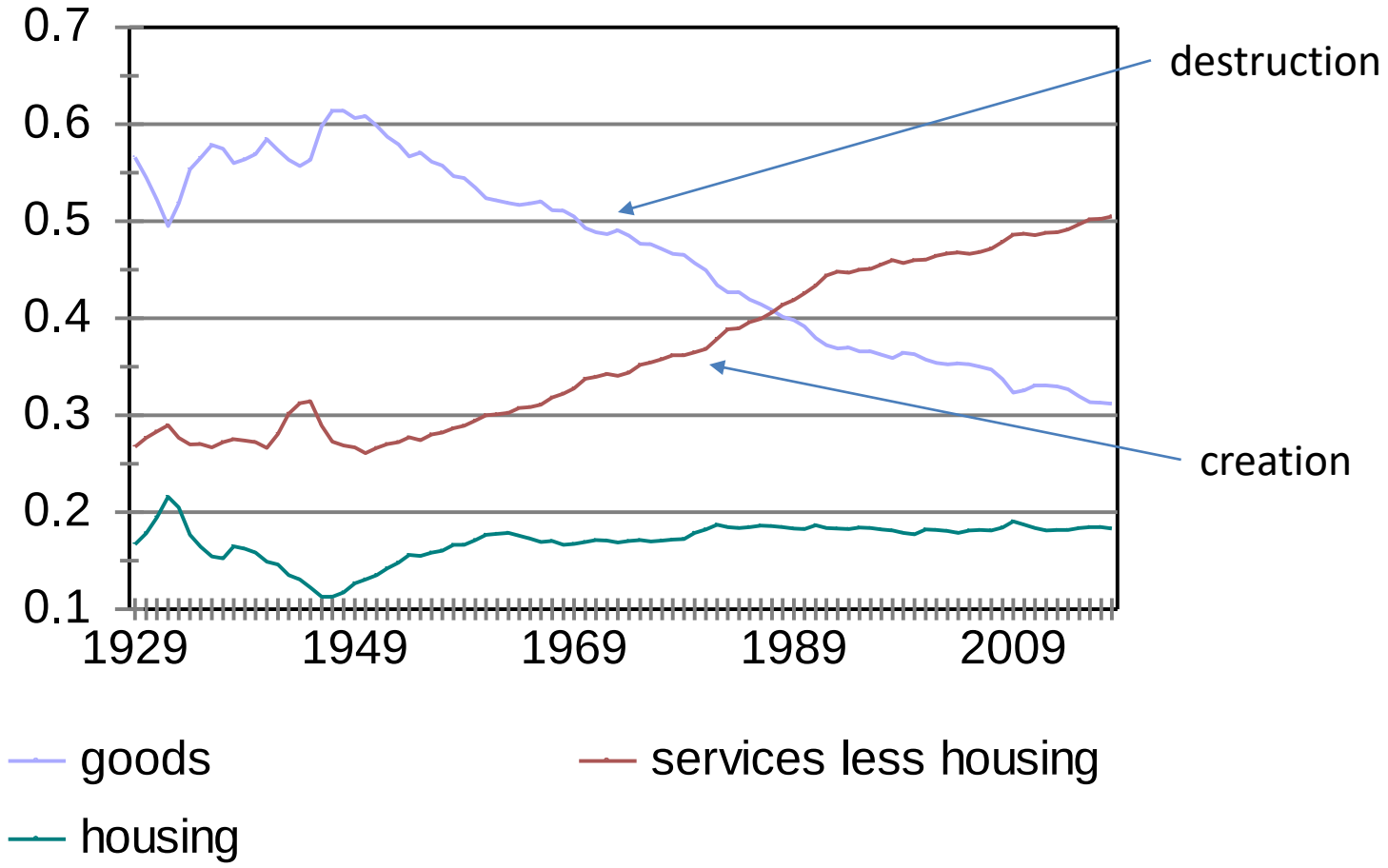
Source: Economist Intelligence Unit; IMB; Institut für Arbeitsmarkt- und Berufsforschung; International Robot Federation; US Social Security data; McKinsey analysis

McKinsey&Company

Robots and mechanization generally raise output per worker

- But why are there fewer workers rather than more output?
- This is different from late 19th century when employment increased and output increased even more.
- Answer:
  - Then there was huge growth in demand for manufactures as West was settled.
  - Product innovation meant people kept buying
  - Today there is little growth in demand for manufactures. Demand has shifted to services.

USA is in the midst of a Service Revolution:
a period of 'creative destruction'



What's wrong with services?

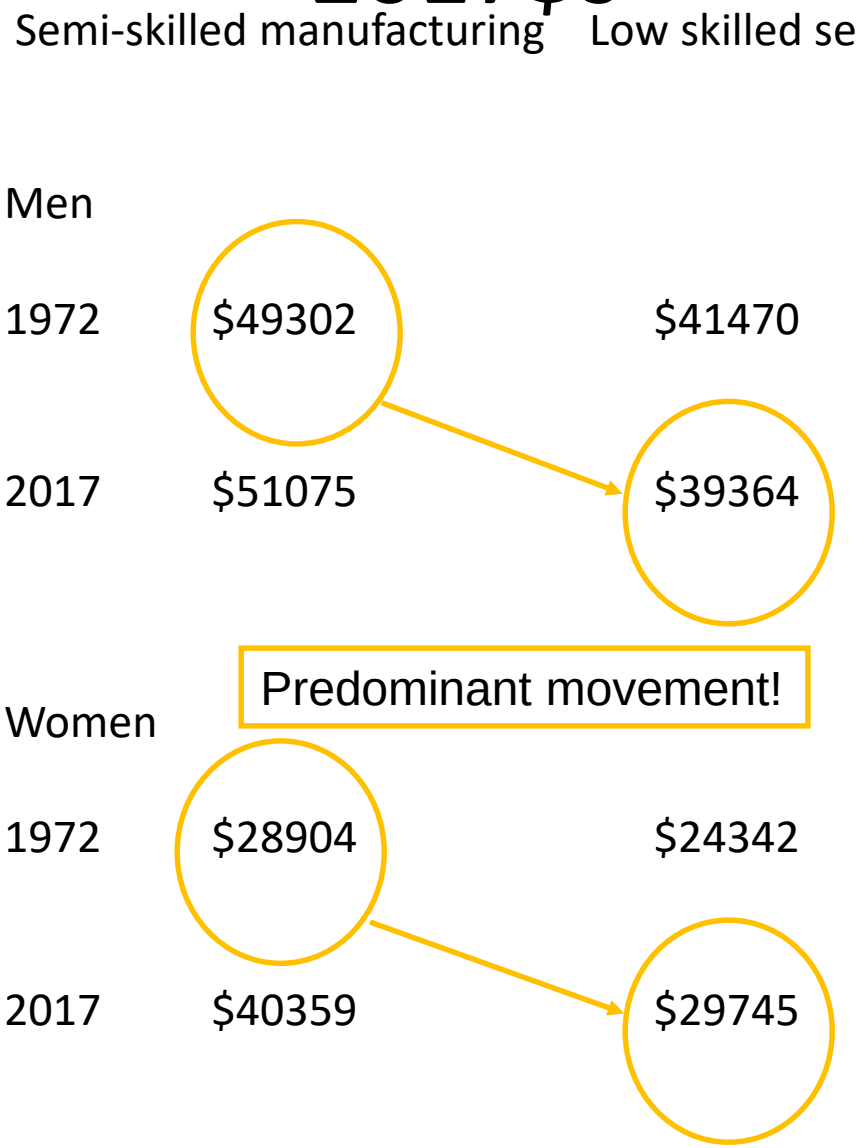
- American 'middle class' based on high wages earned by skilled & semi-skilled factory workers.
- Fewer of these jobs—which is bad
- Service sector creates many professional jobs—which is good.
- But the service sector also proliferates low wage, part times jobs—which is bad.
  - Many semiskilled factory workers lost jobs and ended up with lower paid service jobs.

What happened to the children of the 'American middle class'?

	1960	2010	the change 1960 to 2010	change for groups
<u>Expanding Groups</u>				
Farmers	0.04	0.01	-0.03	
Proprietors	0.03	0.02	-0.01	
Managers	0.06	0.10	0.04	
Professionals	0.12	0.20	0.08	0.07
Clerical workers	0.15	0.16	0.01	
Sales workers	0.07	0.10	0.03	0.04
Service workers	0.09	0.21	0.12	0.12
<u>Contracting Groups</u>				
Craft workers	0.14	0.09	-0.06	
Operatives	0.19	0.08	-0.12	-0.17
Domestic service workers	0.03	0.01	-0.02	
Farm laborers	0.02	0.00	-0.02	
Laborers	0.05	0.03	-0.02	-0.06

Annual Earnings of Full-Time Workers 2017 $s

Annual Earnings of Full-Time Workers 2017$s



One social base of Trump = white working class men

- They have lost out as many factory jobs have disappeared
- and the earnings of those that survive have stagnated.
- Resentment against women who have realized rising earnings partly through equal pay laws.
- Resentment against African Americans who have benefited from affirmative action.
- These policies are those of the ‘Liberal Elite,’ whom they also dislike.

What is to be done?

- Nothing
  - situation will improve by itself (Pangloss)
  - intervention cannot be justified (libertarian)
- Tariffs, stop immigration, wall building (Trump)
- More education (liberal)
- Green industrial revolution (green)
- Market interventions (social democratic)
  - Extend collective bargaining
  - Higher minimum wage
  - Extended employment rights
  - Public ownership of business

The End
Thank you!