CSCI 245 Life, Computers, and Everything

Work and Wealth

Image source

Technologies that disrupted “the workplace?”

Consequences to the workplace?

Automation

Jobs need fewer people

manufacturing jobs

white-collar jobs

Automation

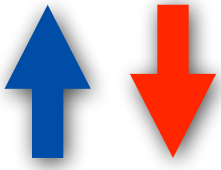
Jobs need fewer people

unemployment

productivity

industrial revenue

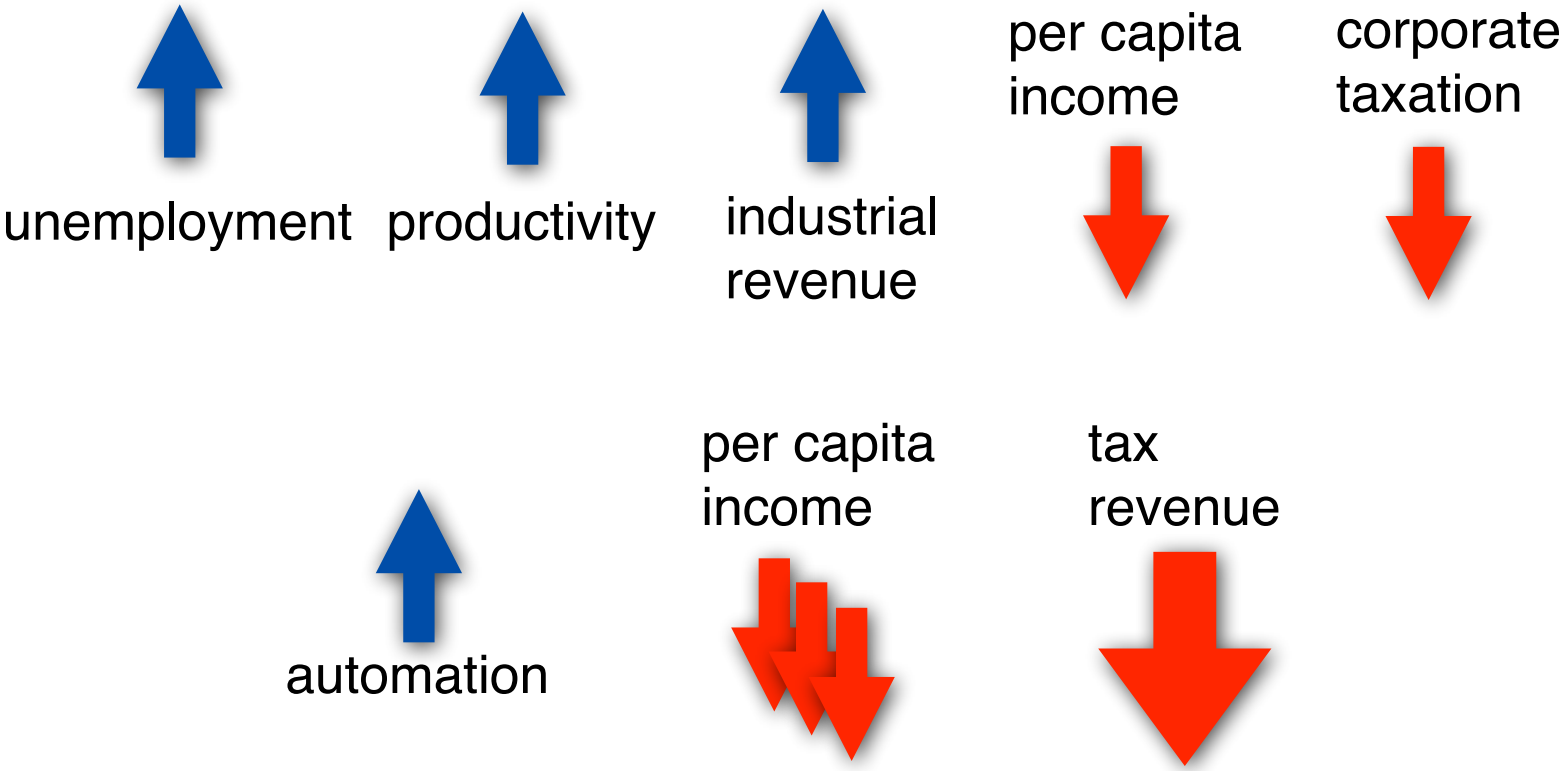
per capita income

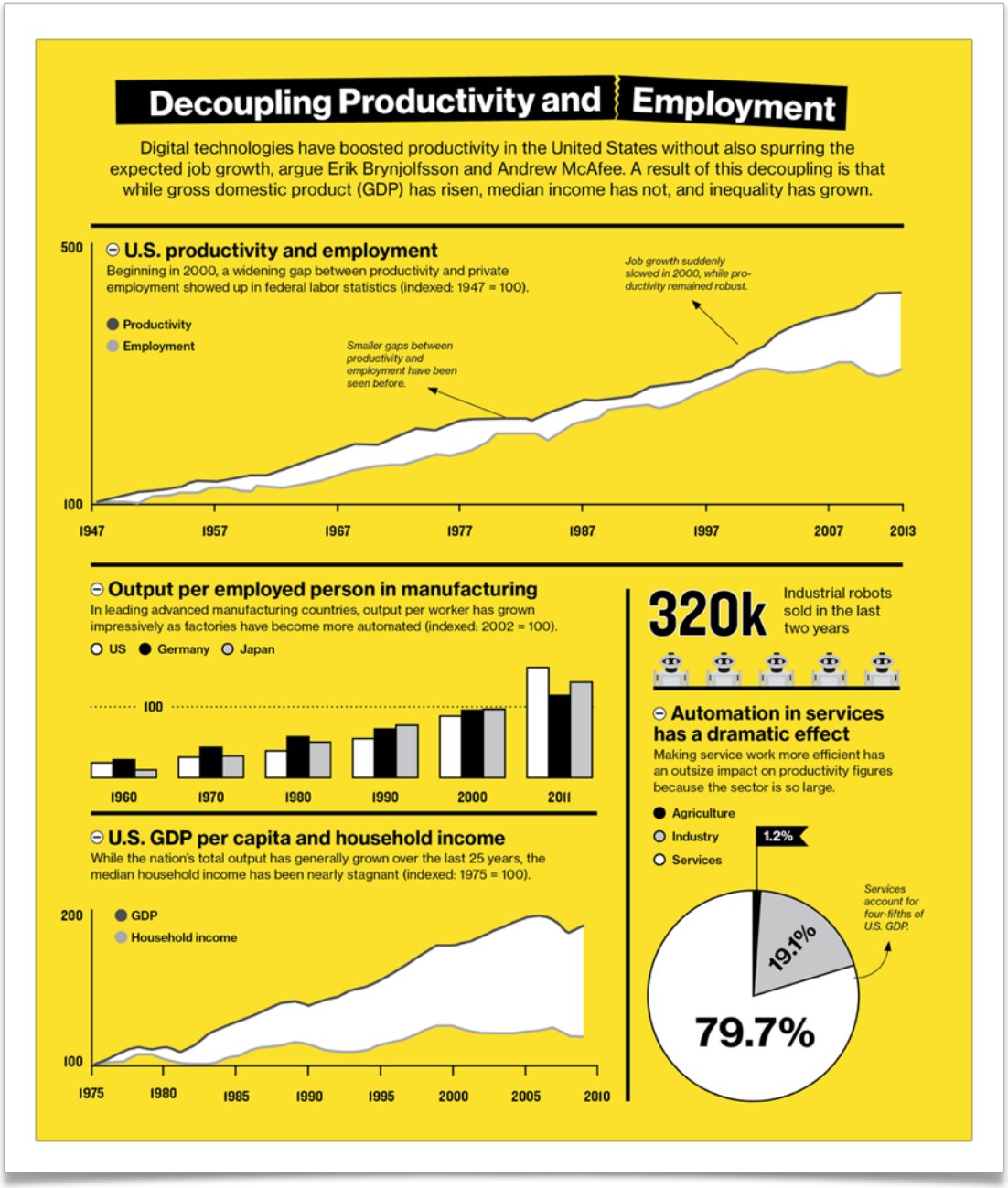


GDP?

Controversy

Jobs need fewer people





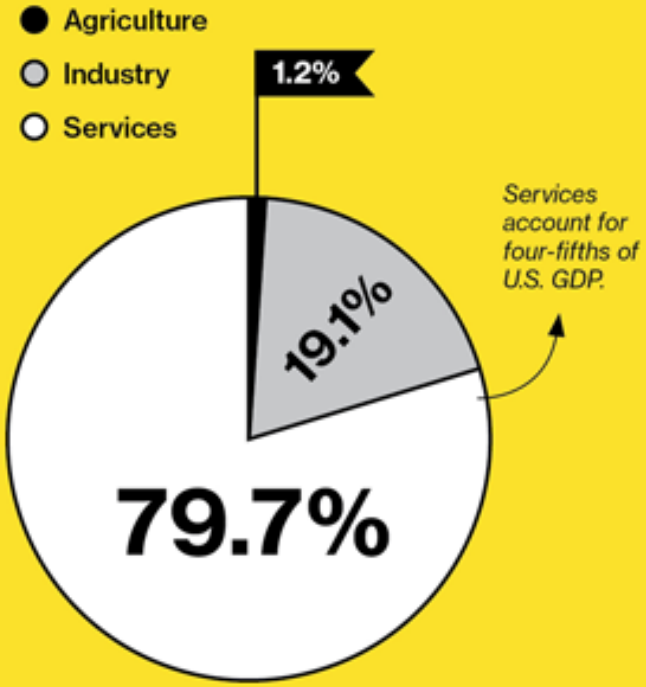
https://www.technologyreview.com/s/515926/how-technology-is-destroying-jobs/

320k

Industrial robots sold in the last two years

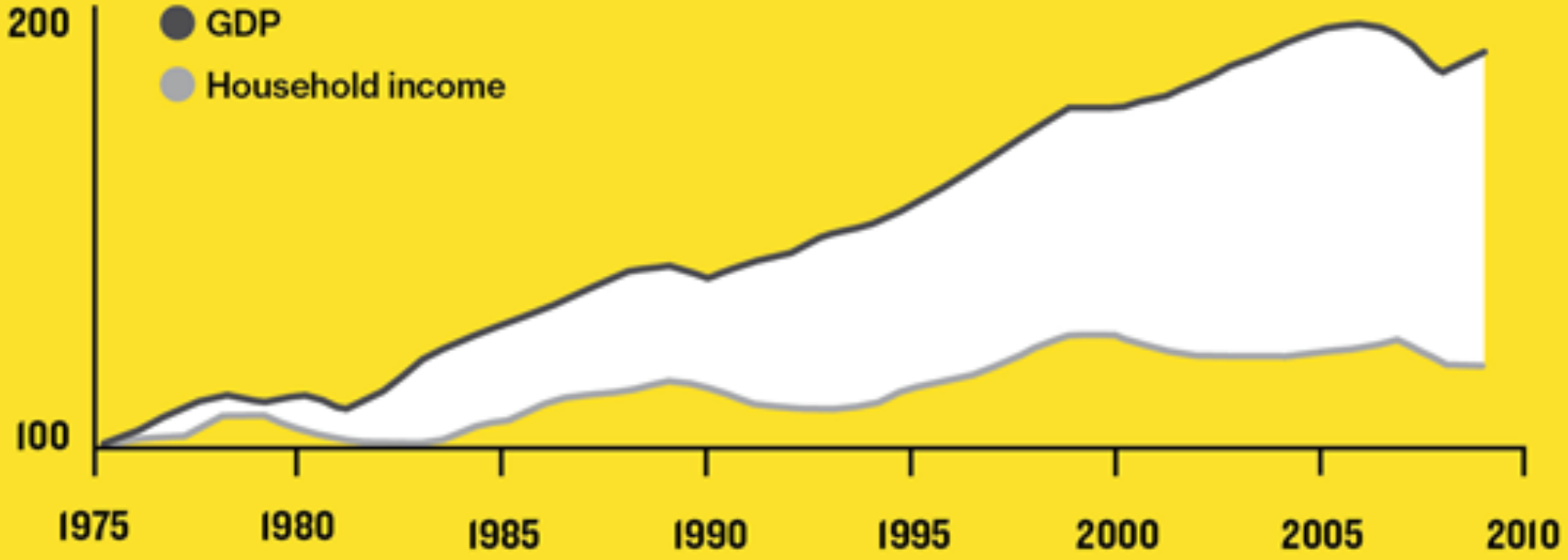
Automation in services has a dramatic effect

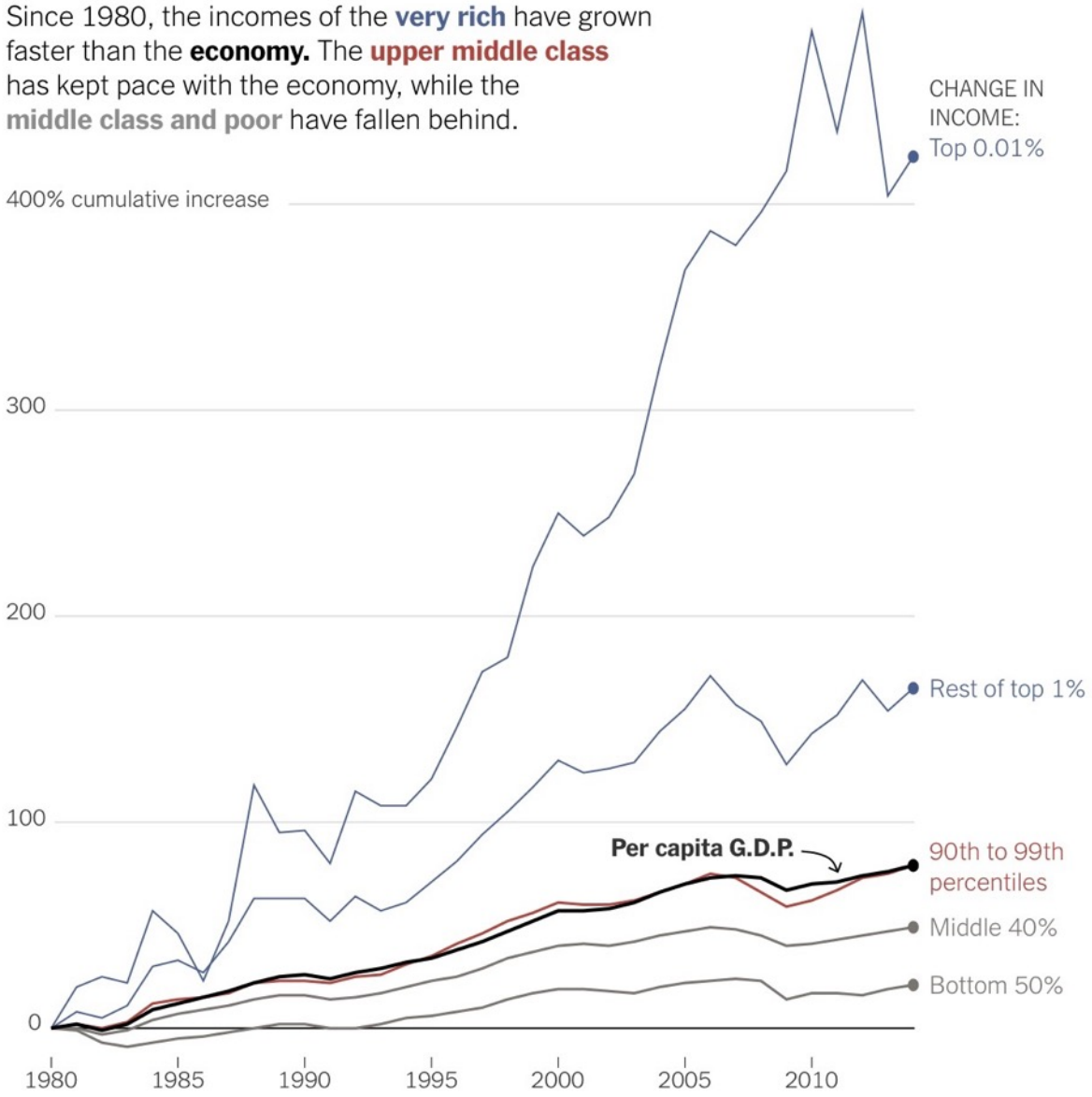
Making service work more efficient has an outsize impact on productivity figures because the sector is so large.



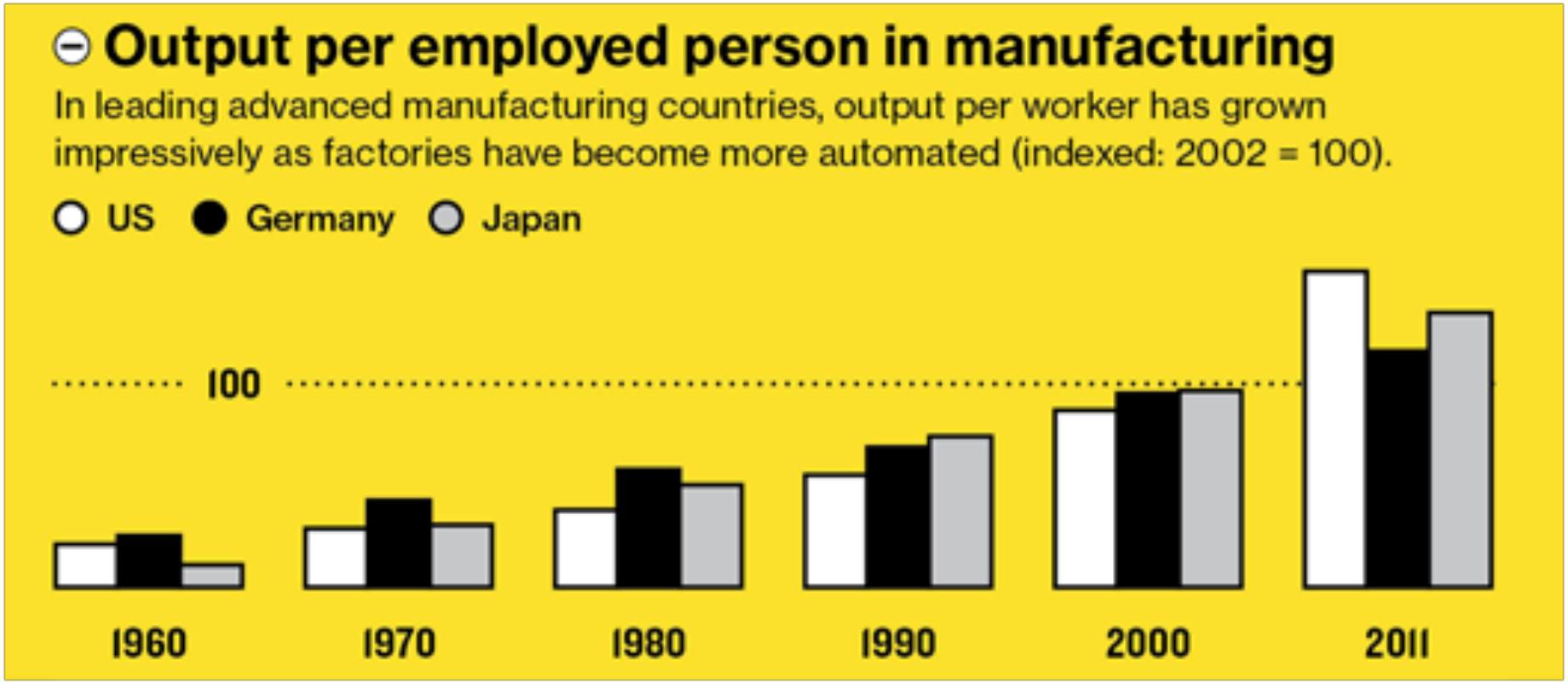
U.S. GDP per capita and household income

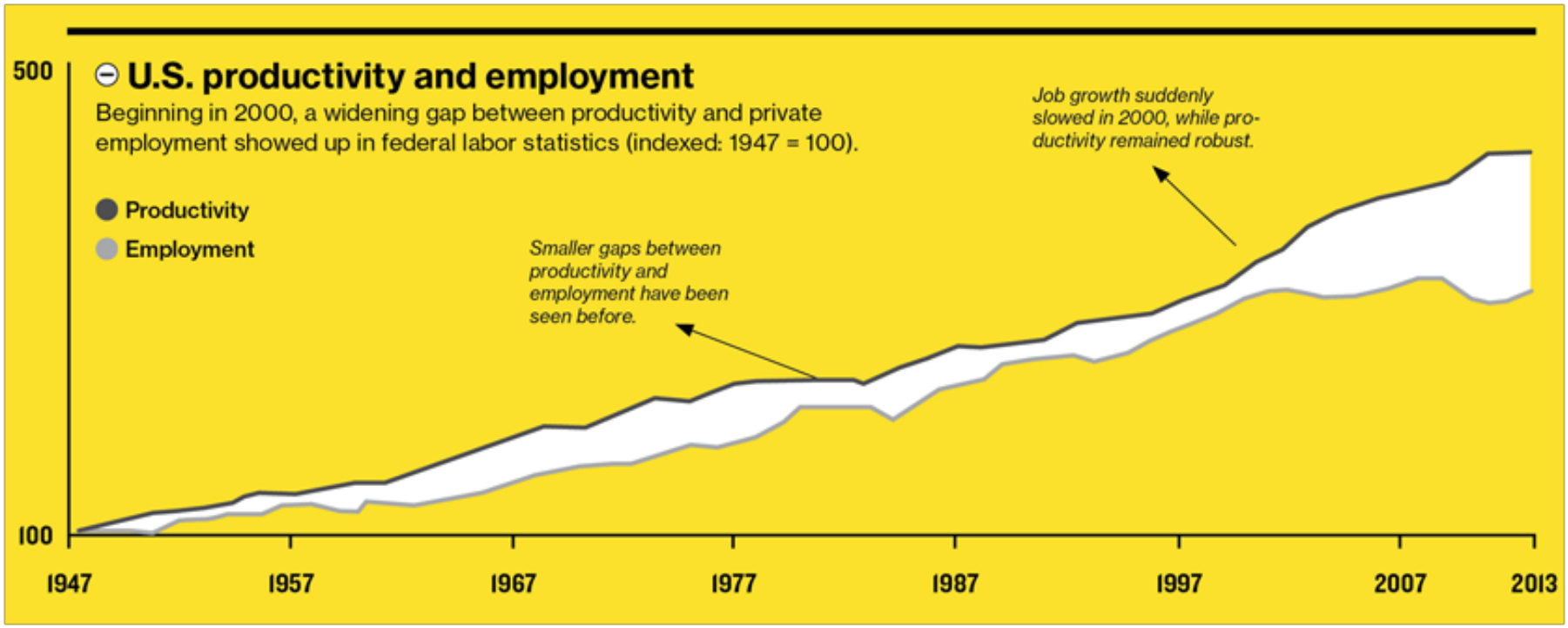
While the nation's total output has generally grown over the last 25 years, the median household income has been nearly stagnant (indexed: 1975 = 100).



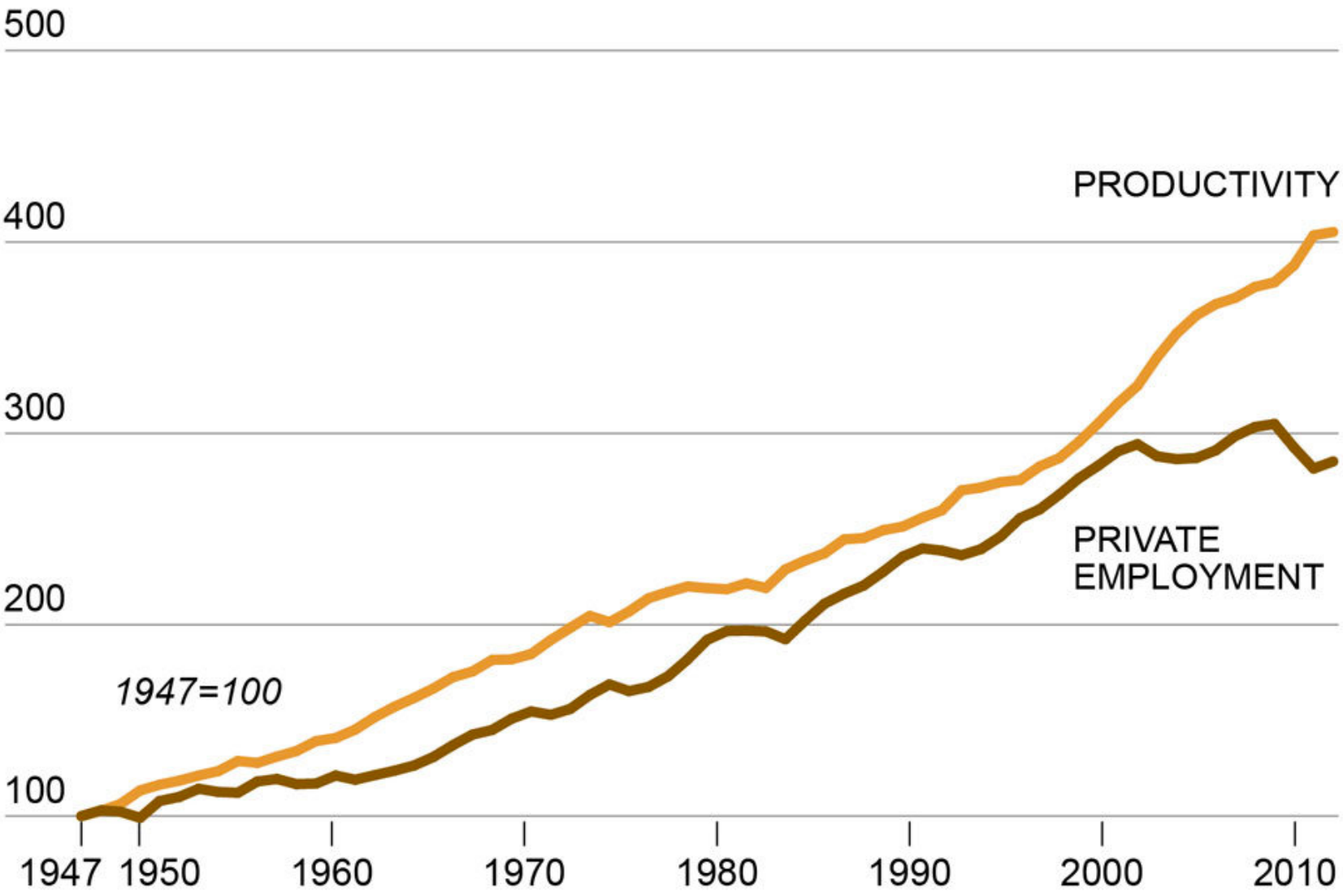


https://nyti.ms/2EaILpR


Output per employed person in manufacturing
In leading advanced manufacturing countries, output per worker has grown impressively as factories have become more automated (indexed: 2002 = 100).
US
Germany
Japan
100
1960
1970
1980
1990
2000
2011


U.S. productivity and employment
Beginning in 2000, a widening gap between productivity and private employment showed up in federal labor statistics (indexed: 1947 = 100).
Productivity
Employment
Smaller gaps between productivity and employment have been seen before.
Job growth suddenly slowed in 2000, while productivity remained robust.
500
100
1947
1957
1967
1977
1987
1997
2007
2013

Productivity and employment in the United States, 1947-2011



Sources: U.S. Department of Labor, Bureau of Labor Statistics

Working Harder

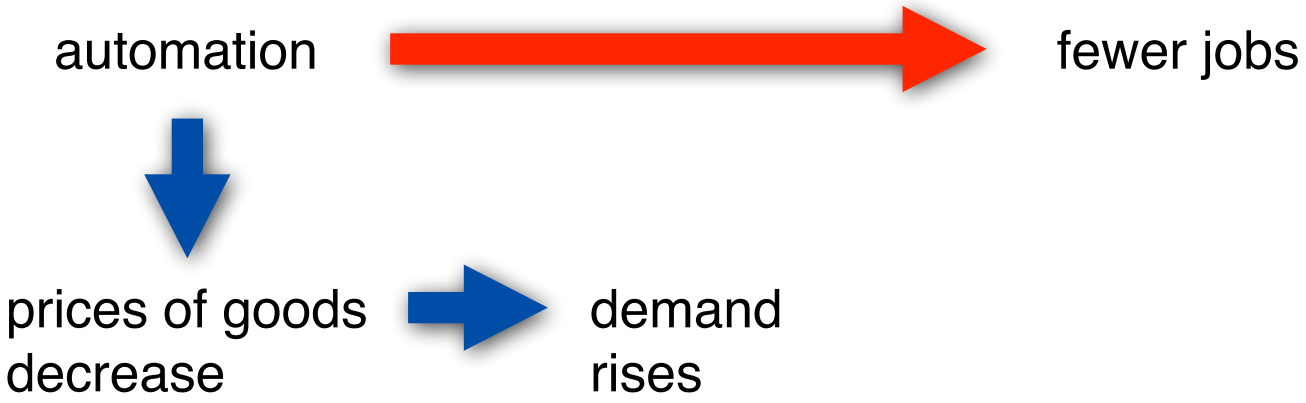
"Late capitalist society is engaged in a long-term historical process of destroying job security… More than ever, we worry about work and are working longer hours; we are more than ever **driven**, **nervous**, **seemingly trapped**. At the very same time, and paradoxically, the twenty-first century bodes a time of post-work: of automation and work reorganization replacing people faster and at faster rates."

Quinn, Ethics for the Information Age, 7th ed., pp. 455

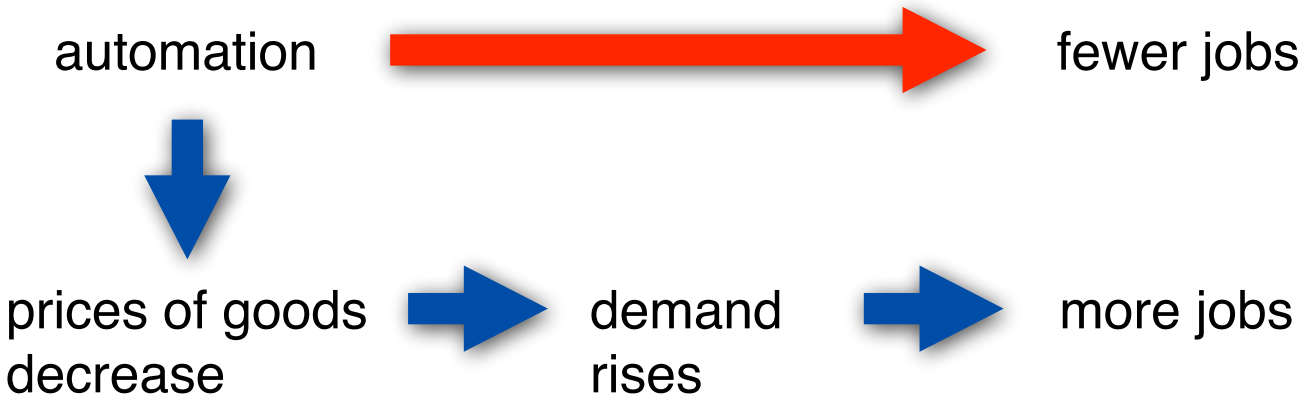
Jobs Again

automation  fewer jobs

Jobs Again


automation
fewer jobs
prices of goods decrease
demand rises

Jobs Again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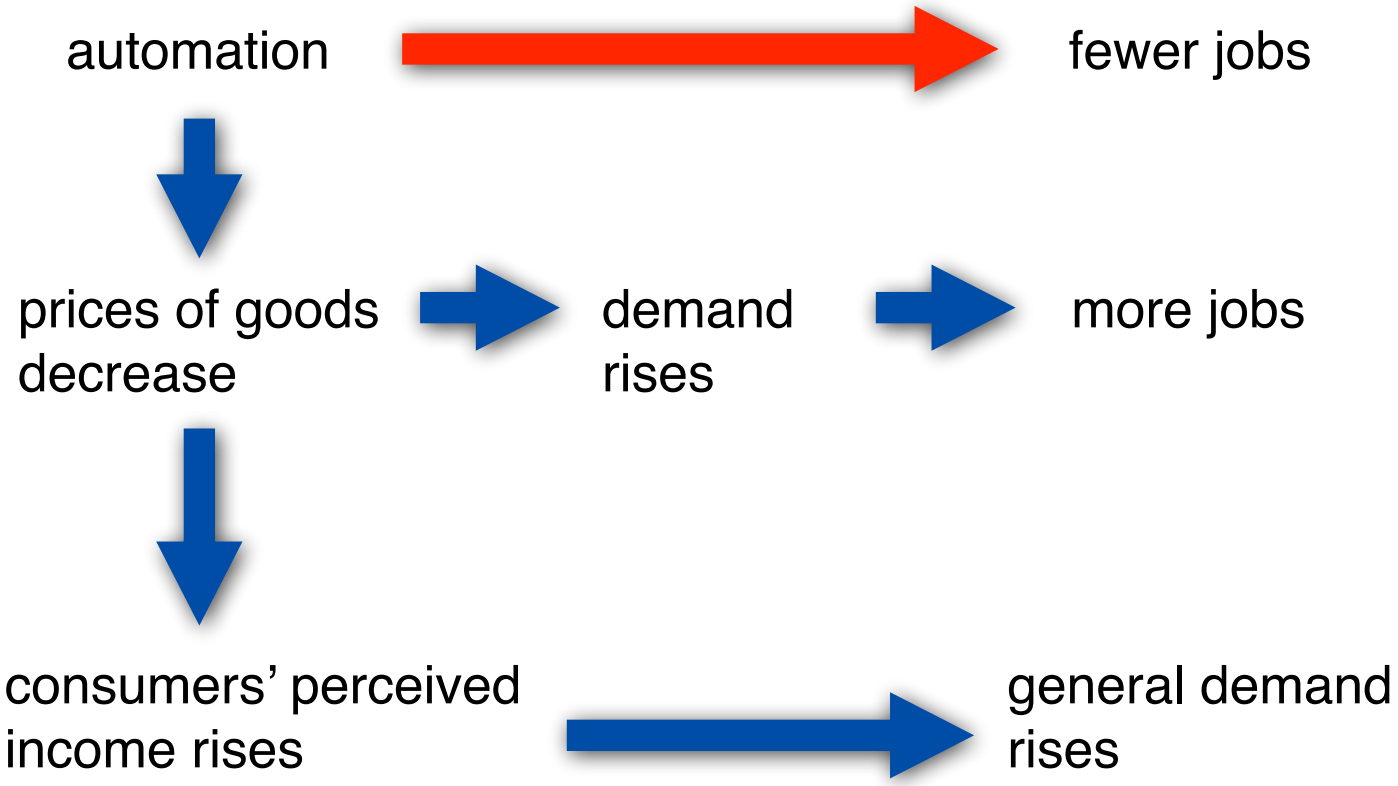
Jobs Again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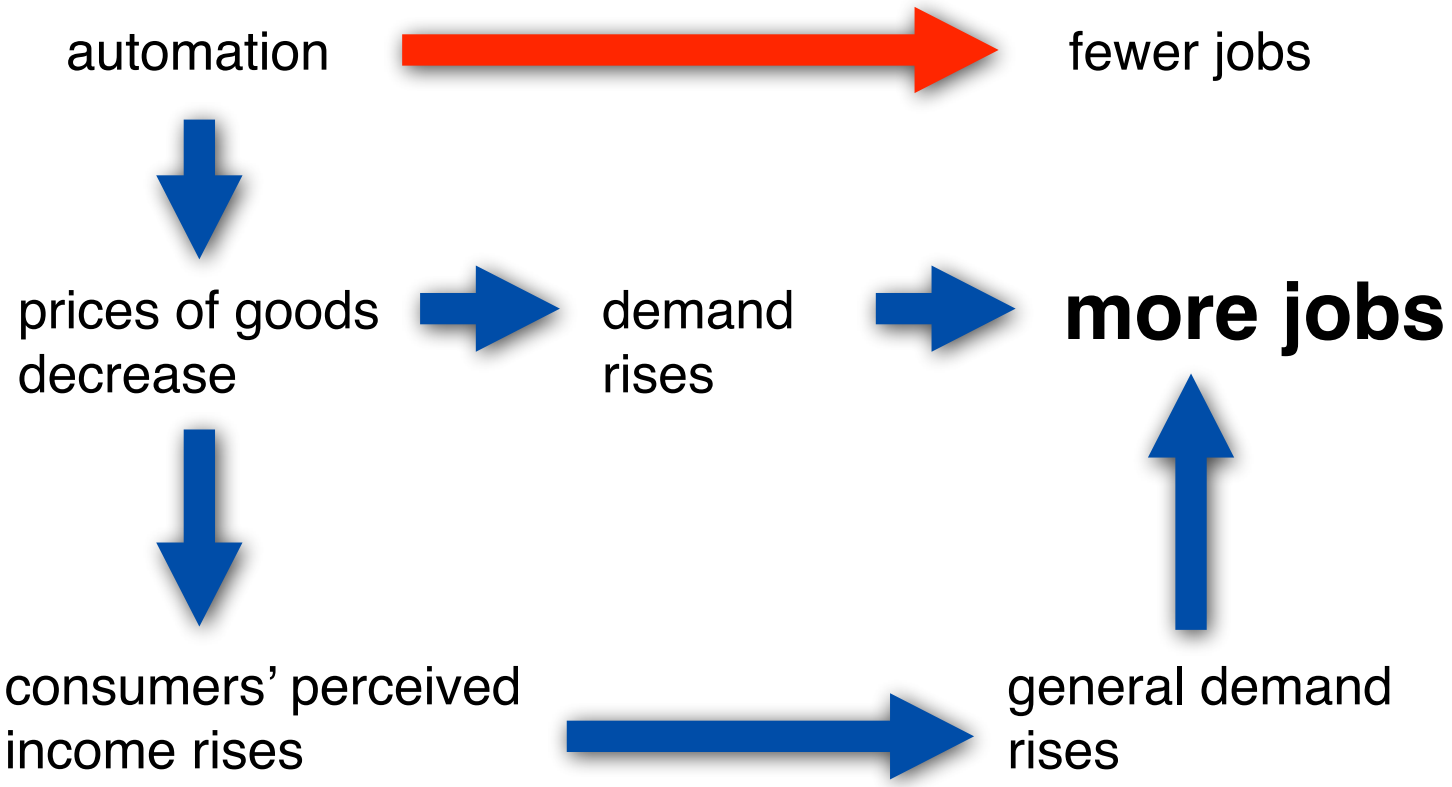
prices of goods decrease
demand rises
more jobs
consumers' perceived income rises
general demand rises

Jobs Again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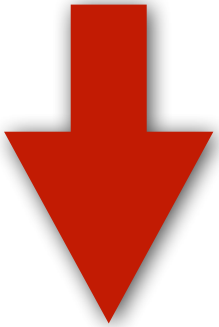
Job Changes

- Computer engineers
- Computer support specialists
- System analysts
- Database administrators
- Desktop publishing specialists
- Web designers
- CRM



- Clerical workers
- Procurement specialists
- Financial processing
- Secretaries, stenographers
- Computer operators
- Communication equipment operators

Losses to Automation

Predicted Jobs Automation Will Create and Destroy

When	Where	Jobs Destroyed	Jobs Created	Predictor
2020	worldwide		1,000,000-2,000,000	Metra Martech
2020	worldwide	1,800,000	2,300,000	Gartner
2020	sampling of 15 countries	7,100,000	2,000,000	World Economic Forum (WEF)
2021	worldwide		1,900,000-3,500,000	The International Federation of Robotics
2021	US jobs	9,108,900*		Forrester
2022	worldwide	1,000,000,000		Thomas Frey
2025	US jobs	24,186,240*	13,604,760*	Forrester

https://www.technologyreview.com/s/610005/every-study-we-could-find-on-what-automation-will-do-to-jobs-in-one-chart/

Losses to Automation

Predicted Jobs Automation Will Create and Destroy

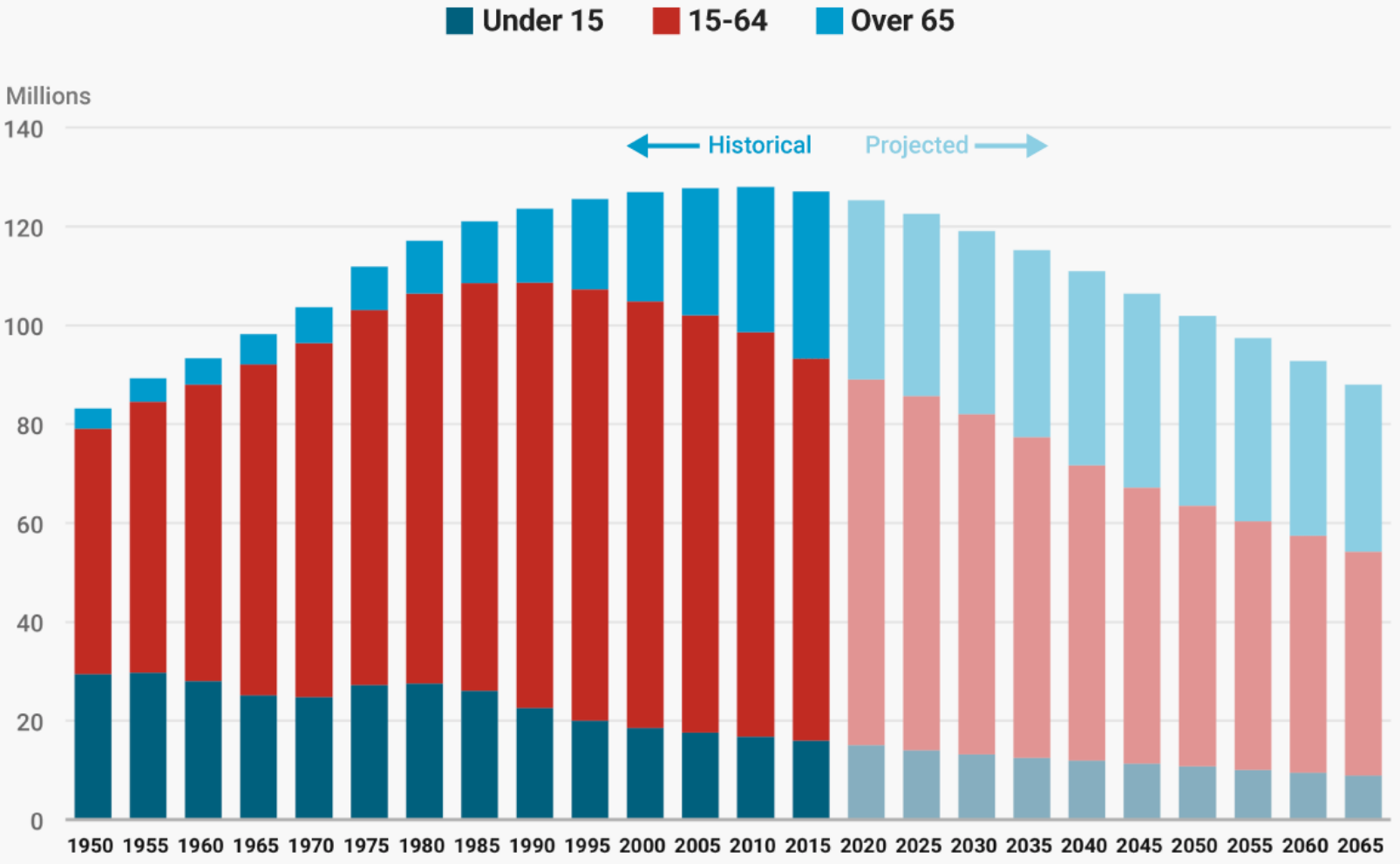
When	Where	Jobs Destroyed	Jobs Created	Predictor
2025	US jobs	3,400,000		ScienceAlert
2027	US jobs	24,700,000	14,900,000	Forrester
2030	worldwide	2,000,000,000		Thomas Frey
2030	worldwide	400,000,000-800,000,000	555,000,000-890,000,000	McKinsey
2030	US jobs	58,164,320*		PWC
2035	US jobs	80,000,000		Bank of England
2035	UK jobs	15,000,000		Bank of England
No Date	US jobs	13,594,320*		OECD

https://www.technologyreview.com/s/610005/every-study-we-could-find-on-what-automation-will-do-to-jobs-in-one-chart/

Automation has a positive role to play

https://www.youtube.com/watch?v=LgmWUxBAgS0

JAPAN'S POPULATION BY AGE



SOURCE: Japan National Institute of Population and Social-Security Research

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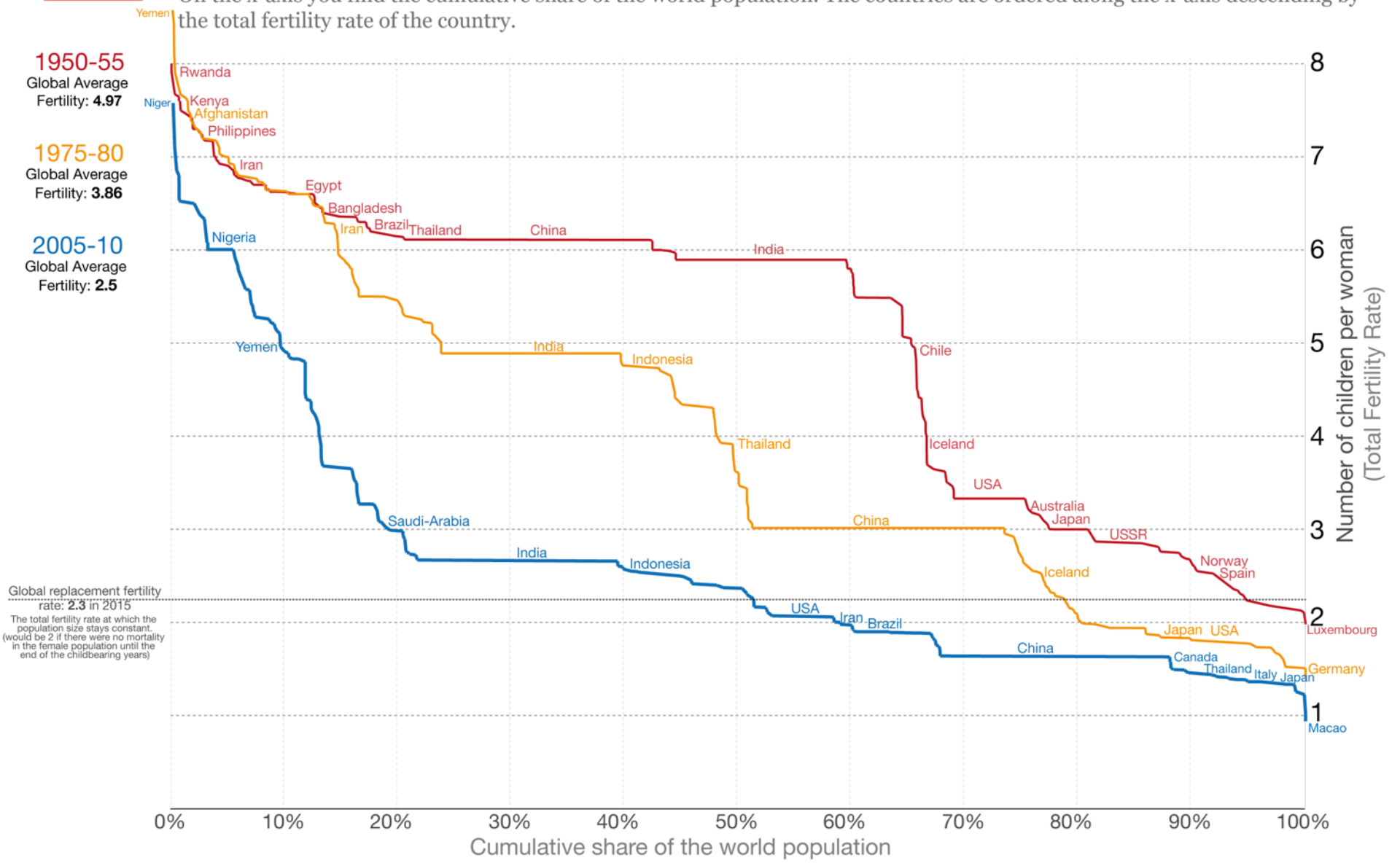
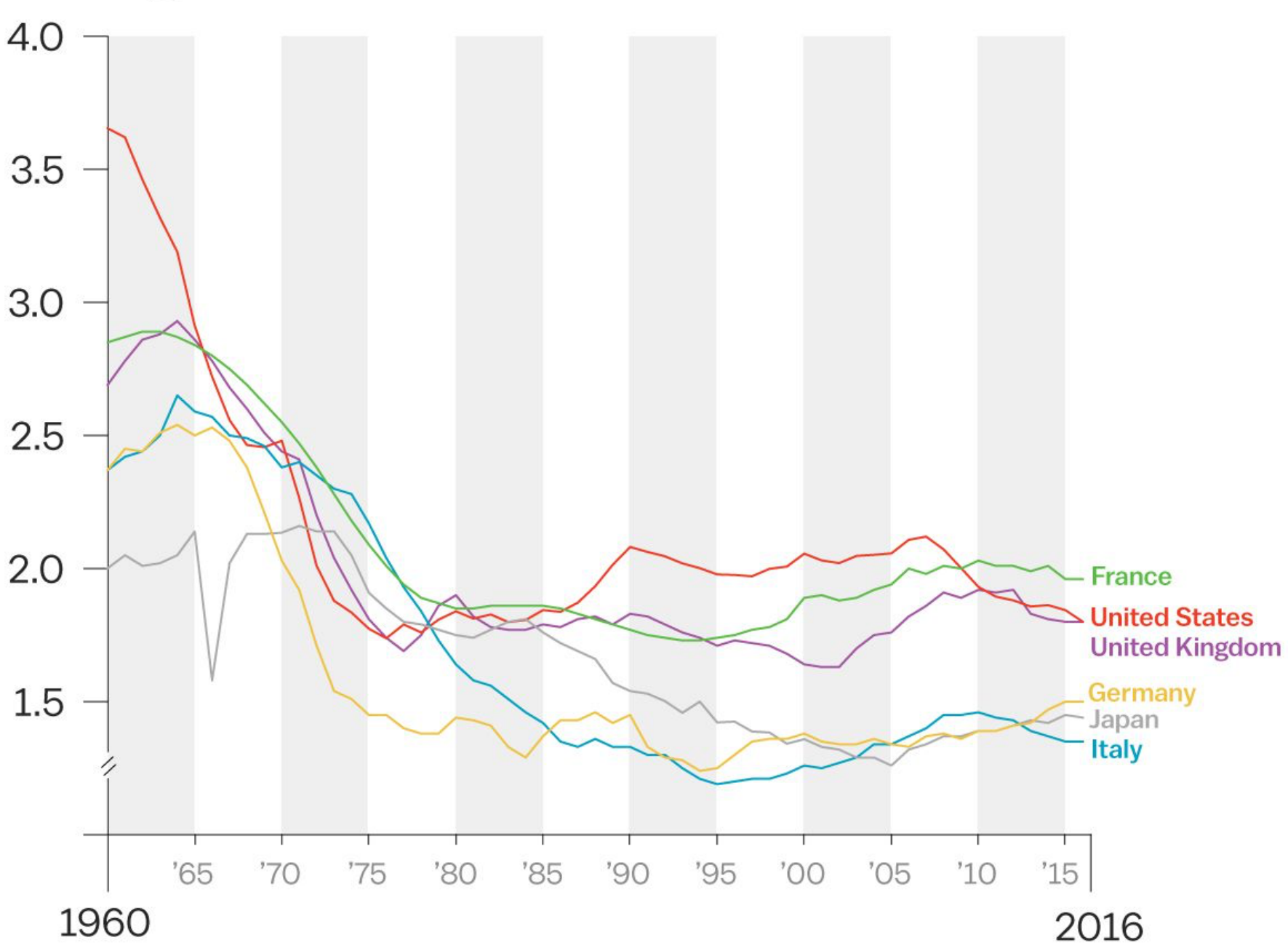
World population by level of fertility over time (1950-2010)

On the x-axis you find the cumulative share of the world population. The countries are ordered along the x-axis descending by the total fertility rate of the country.



Data source: United Nations Population Division (2012 revision).
The interactive data visualization is available at OurWorldinData.org. There you find the raw data and more visualizations on this topic.

https://ourworldindata.org/fertility-rate



https://www.vox.com/science-and-health/2018/5/22/17376536/fertility-rate-united-states-births-women

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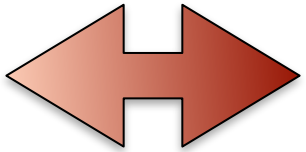
Key Technologies

A.I.  Robotics

How will society adapt?

Self-driving cars

https://www.ucsusa.org/clean-vehicles/how-self-driving-cars-work

Manufacturing

Security

Health services

Customer services

Law

… ?

How will society adapt?

“A guaranteed income floor.”

Not much agreement that universal basic income (UBI) is a solution.