Preparing for Technological Unemployment

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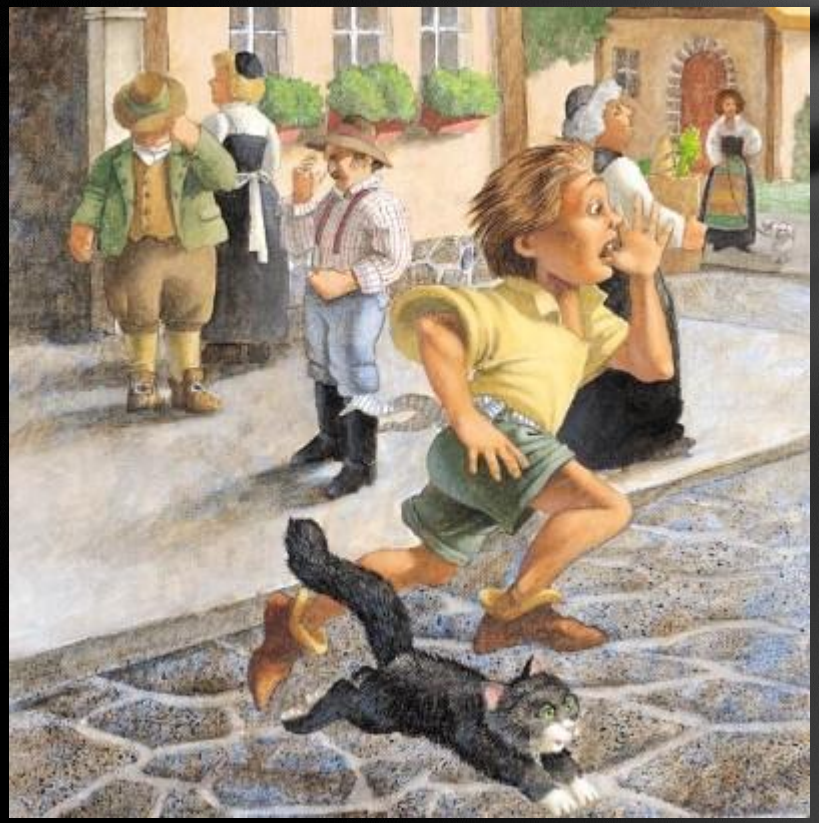
Confronting Incredulity

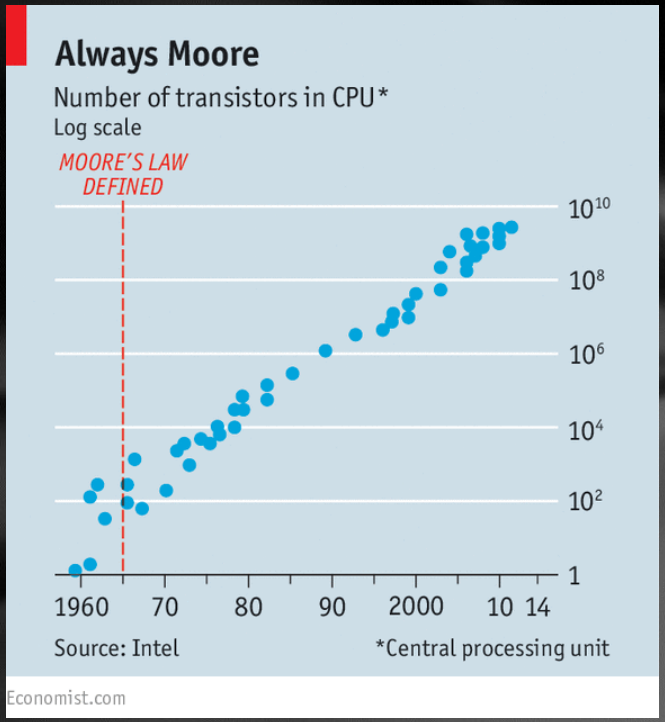
- We are seen as Cassandras or boys who cried wolf
- The common wisdom is that technology has always created new occupations, and will continue to do so



- But this time *is* different

Making the Case

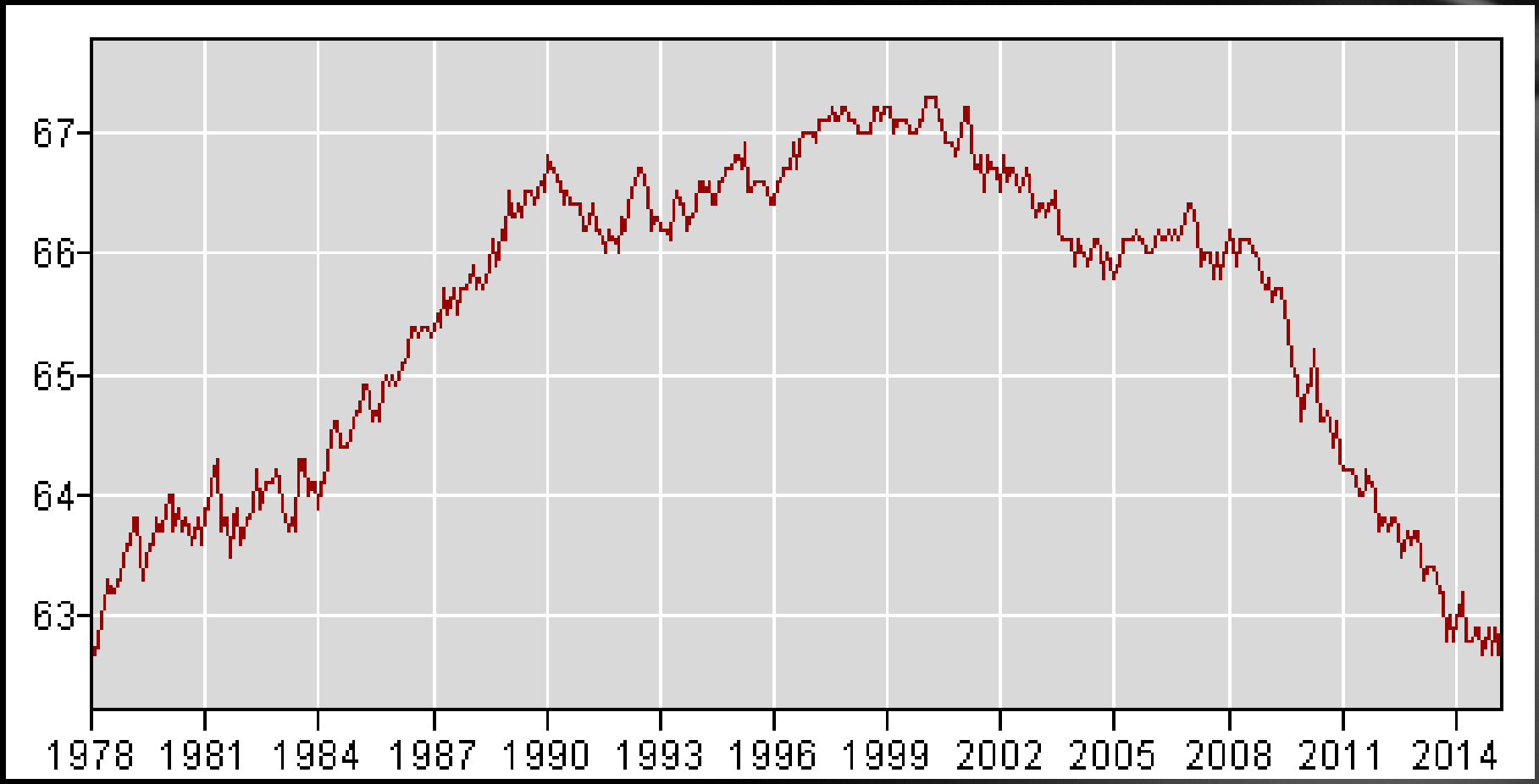
- Is there already tech job loss?
- Has productivity slowed?
- Is tech causing inequality ("skill-biased technological change")?
- Is there growing tech-driven precarity and underemployment?
- Why is this time different?



Is There Already Tech Unemployment ?

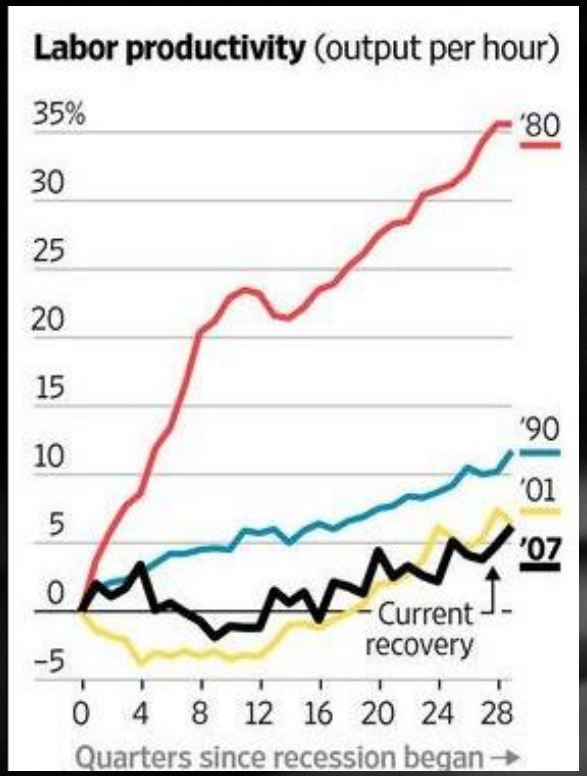
or just *structural unemployment*, bad policies and demographic changes?

US Labor Force Participation Rate



Is There Growing Productivity?

- Decrease in investment in IT infrastructure after 2000, and a slowing growth in labor productivity.
- Graetz and Michaels 2015
  - 1993-2007 use of robots in 14 industries in 17 developed countries
  - *Robots have increased productivity, and accounted for about 10% of overall economic growth.*



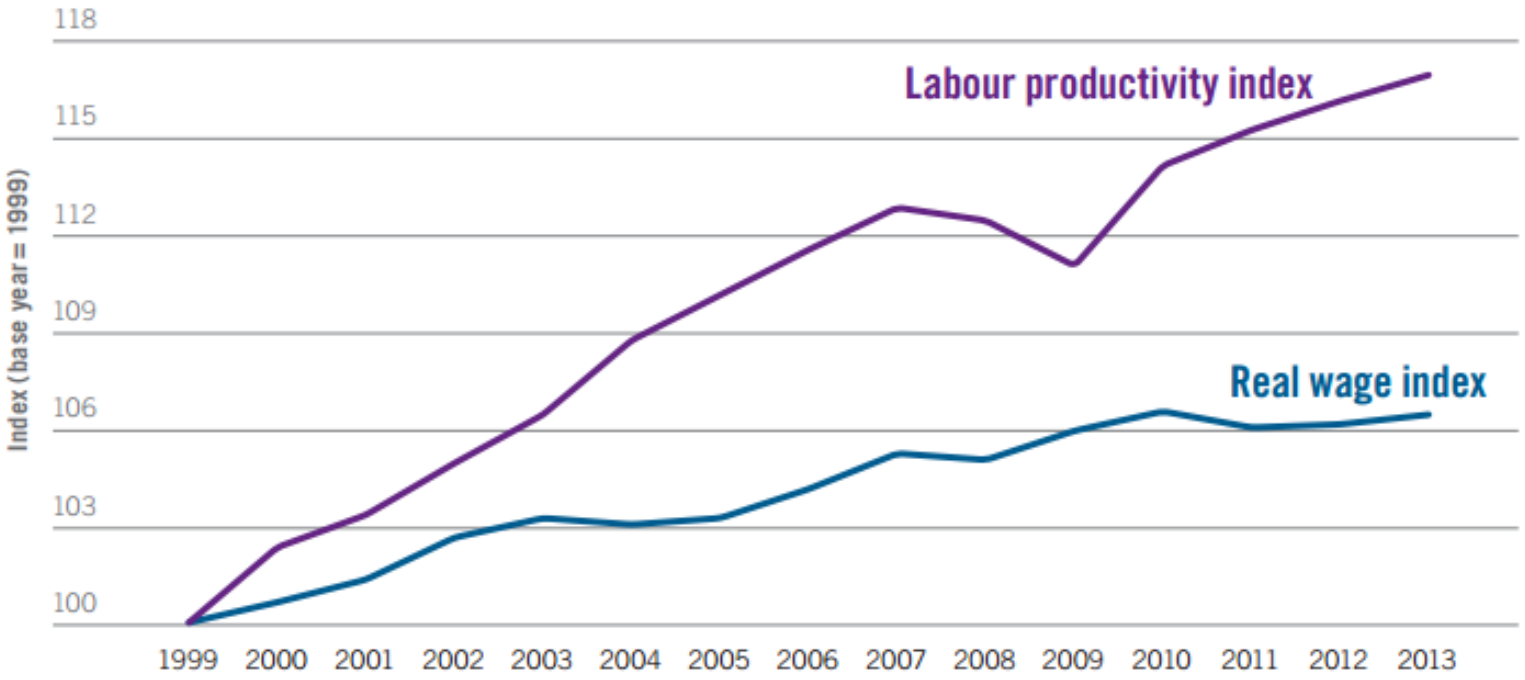
Last decade has seen slower rates of productivity growth than the 1980s and 1990s

But the historical trend is still quite clear

The Great Decoupling

- Productivity no longer creates jobs or rising incomes.

Figure 7 Trends in growth in average wages and labour productivity in developed economies (index), 1999–2013

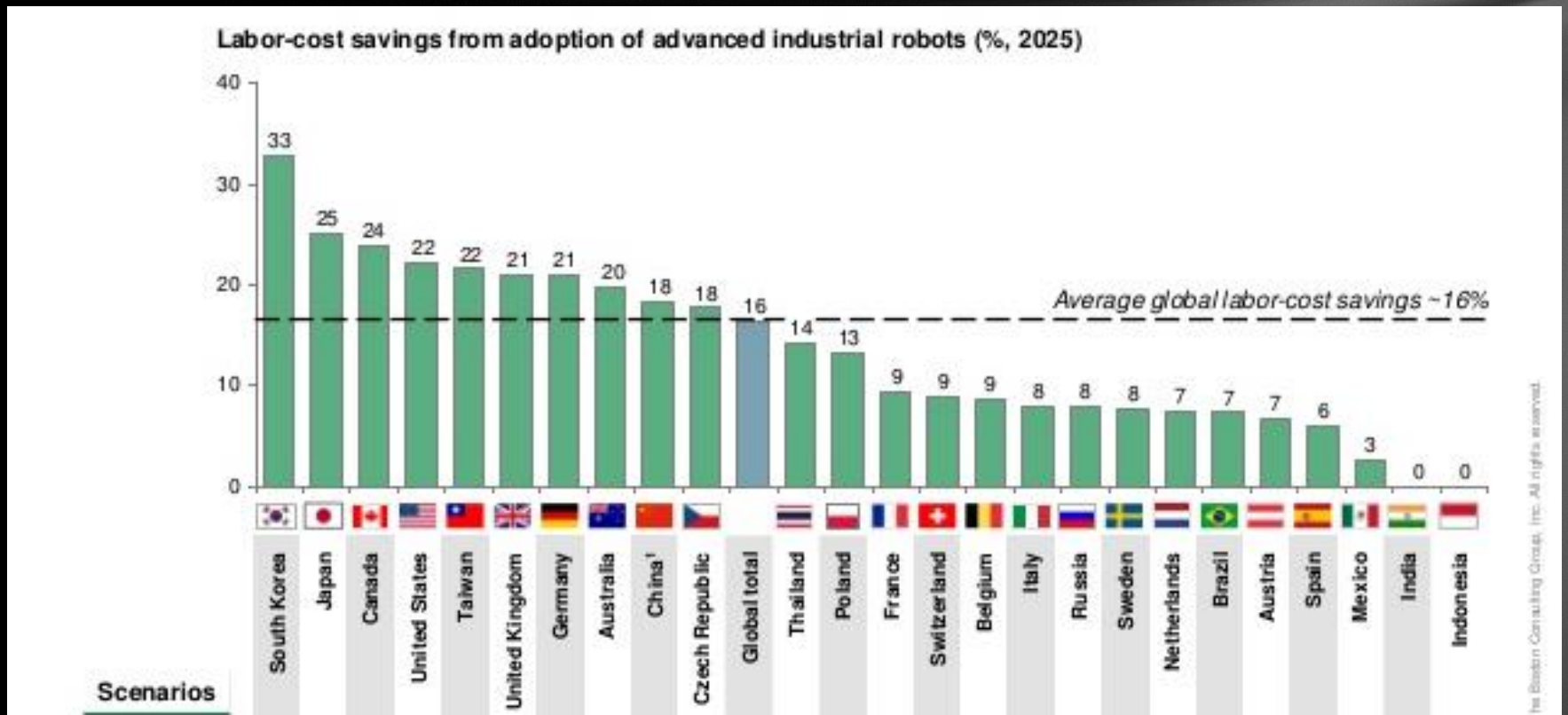


Note: Wage growth is calculated as a weighted average of year-on-year growth in average monthly real wages in 36 economies (for a description of the methodology, see Appendix I). Index is based to 1999 because of data availability.

Sources: ILO Global Wage Database; ILO *Trends Econometric Models*, Apr. 2014. Data accessible at: www.ilo.org/gwr-figures

Imminent Productivity Acceleration

- BCG: Investments in robotics to more than double by 2025.
- Robots, materials, digital manufacturing and 3-D printing will boost productivity.
- By 2025 rising productivity will lower demand for human labor by an average of 25%, and labor costs by an average of 16%, with the largest impacts in South Korea, China, the U.S., Japan, and Germany.



Is Tech Causing Inequality?

- MIT's David Autor: tech is changing skill demands in the economy and exacerbating inequality, but not reducing overall labor demand
- Graetz and Michaels' 2015 "Robots at Work": investment in robotics decreases wages and working hours for low and middle-skill workers
- Also Frey and Osborne's 2015 "Technology at Work"

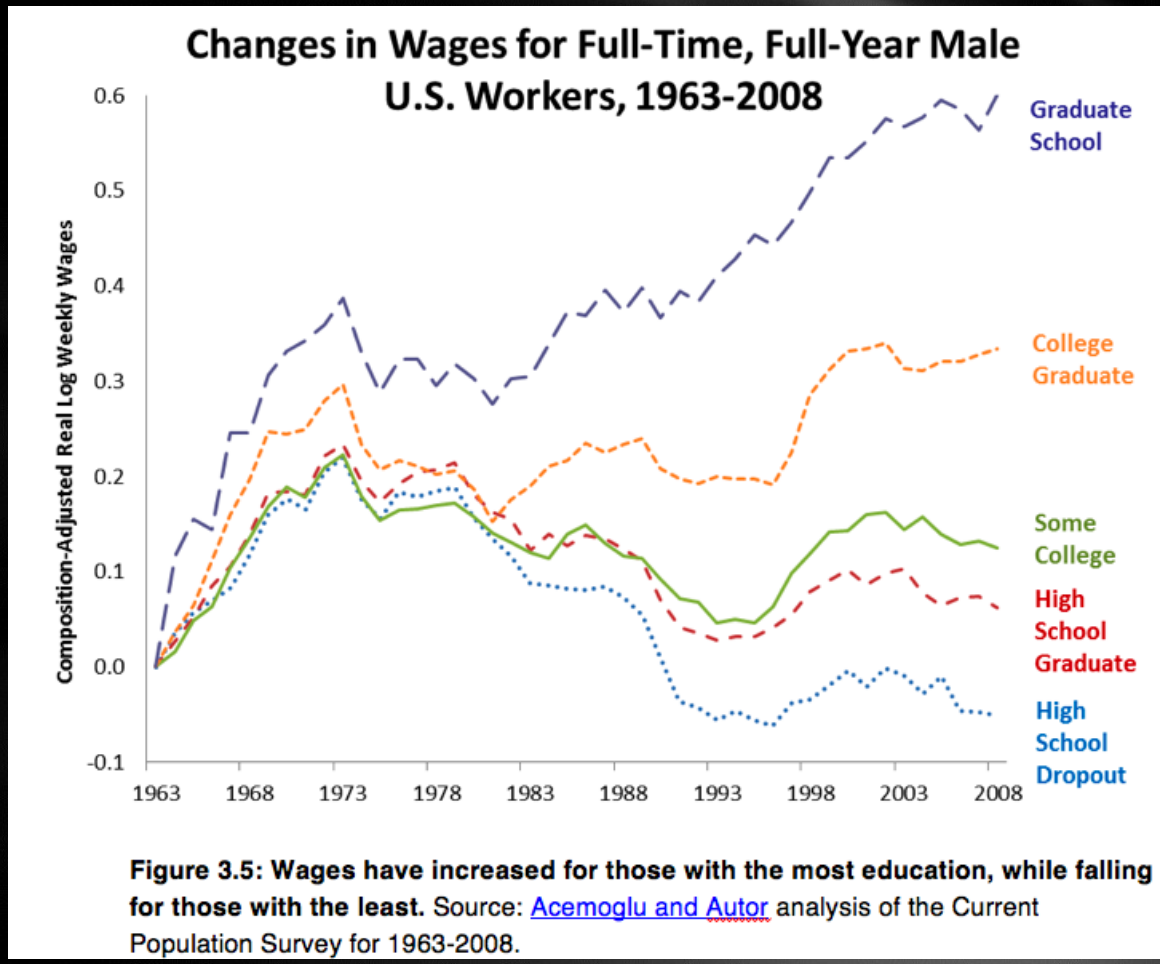
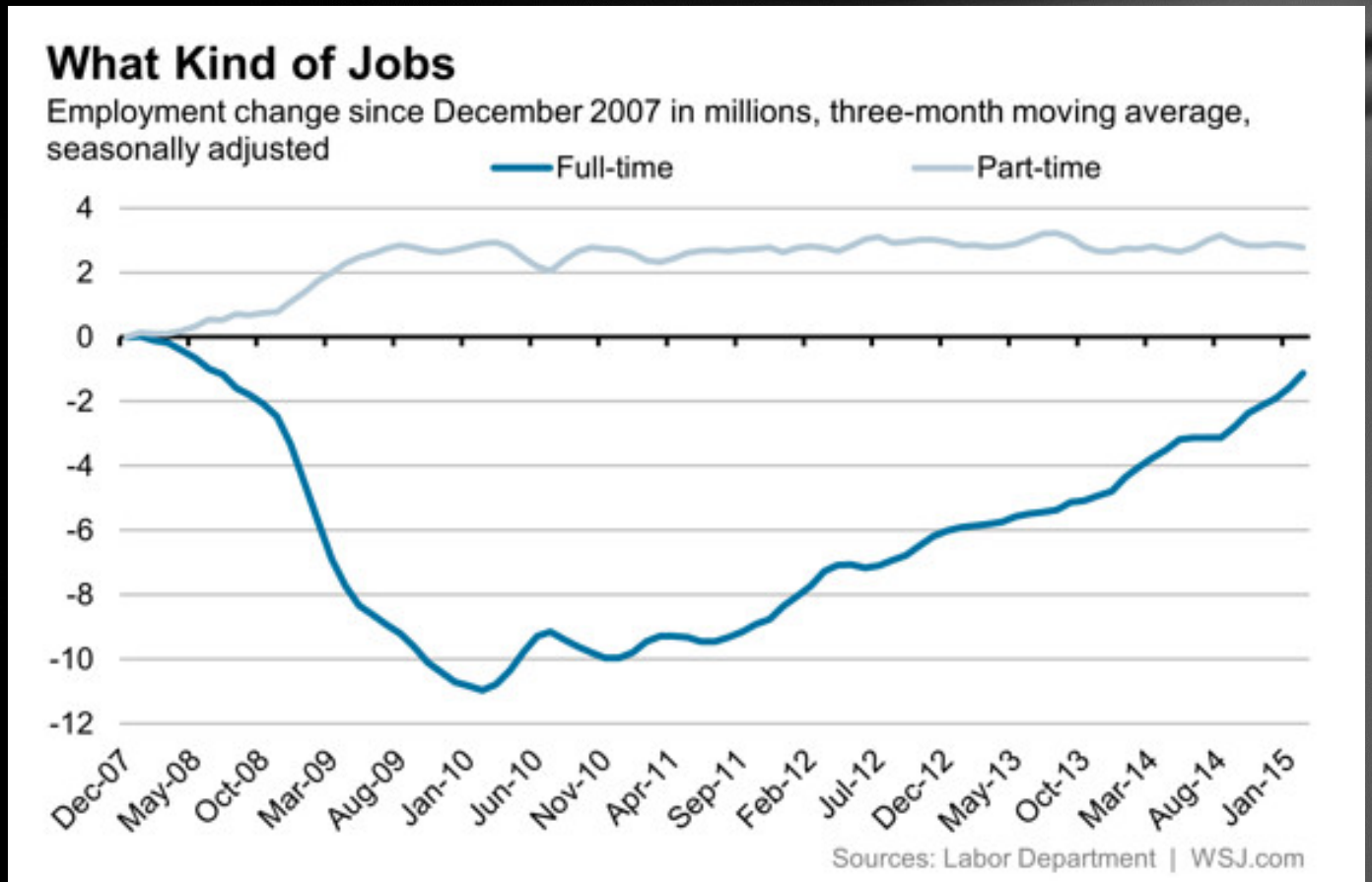


Figure 3.5: Wages have increased for those with the most education, while falling for those with the least. Source: Acemoglu and Autor analysis of the Current Population Survey for 1963-2008.

Growing Precarity and Underemployment

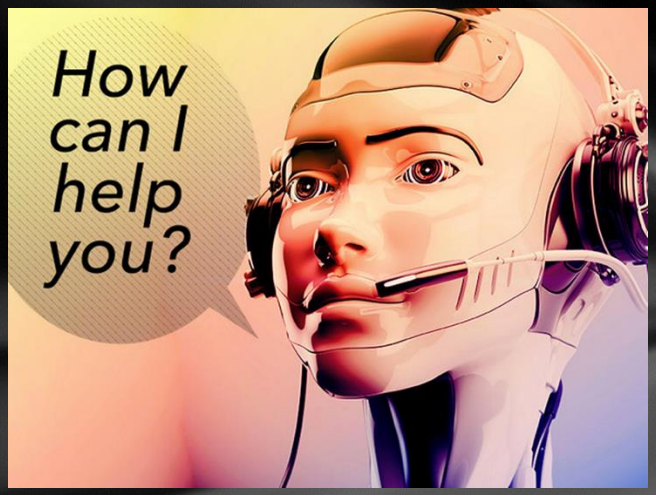
- Worker discouragement has been rising steadily for six years.
- Part-time jobs have been growing faster than full-time jobs



Preparing for the Tipping Point

- Are there immune occupations?
- What will the macroeconomic effects of tech unemployment be?
- How will tech unemployment interact with old age dependency and extending longevity?
- What are policy responses to ameliorate structural or tech unemployment?

Are There Immune Occupations?

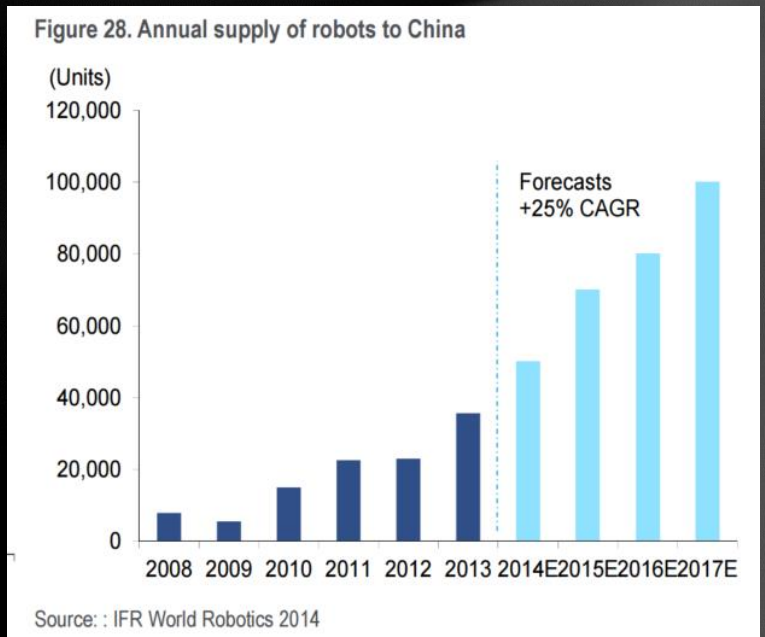


- There are more and less automatable jobs, but none are safe in the long run.
- More resilient skills:
  - Creativity
    "Creativity vs Robots" 2015 Bakhshi, Frey, Osborne
    – 20%-25% of jobs demand creativity, mostly well paid
  - Social intelligence and affective skills – some well-paid
  - Perception, dexterity and manipulation – mostly not well-paid
- *More liberal arts, less narrow technical education*

MacroEconomic Effects of TU

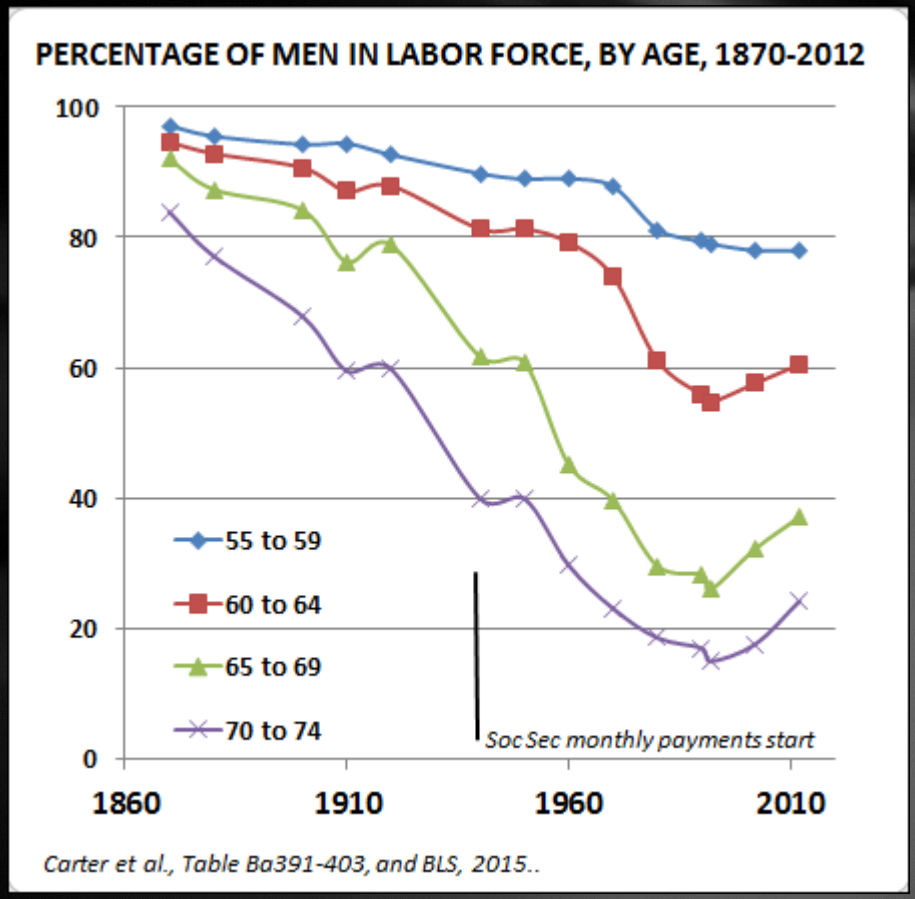
- Piketty: historically, slow growth increased inequality. But that was when growth created jobs and income.
- OECD: rising inequality has already slowed economic growth.
- Concentration of wealth and declining jobs will slow economic growth in all countries.
- Falling cost of automation will reduce outsourcing of jobs to developing world.
- Increasing use of automation in the *developing world* will slow growth of middle classes and lead to economic and political instability.

China is sharply increasing investments in robots to stem rising labor costs



Demography and TU

- The retirement of the Boomers, and declining fertility, will reduce impacts of technological unemployment on labor demand, but…
- Growing old age dependency ratios will exacerbate demands on the state, and create pressure to raise the retirement age.
- Longevity therapies will accelerate aging of the population, dependency burden and demands for raising the retirement age.



Policy Responses

Gary E. Marchant, Yvonne A. Stevens and James M. Hennessy (2014) "Technology, Unemployment & Policy Options"

- Protecting Employment
- Encourage Work Sharing
- Work Retraining and Curricular innovation
- Make New Work
- Redistribution and Expansion of Social Safety Net

Protecting Employment

Options:

- Place legal or regulatory limits on technological development
- Mandate human workers

Downsides:

- Reduces quality, consumer convenience and competitiveness, increases cost

New Jersey gas station owners now want ban on self-serve reversed

Shorter Work Week, Year, Life

Options:

- *Lower* mandatory retirement age
- Mandating more vacation time
- Shorter work week

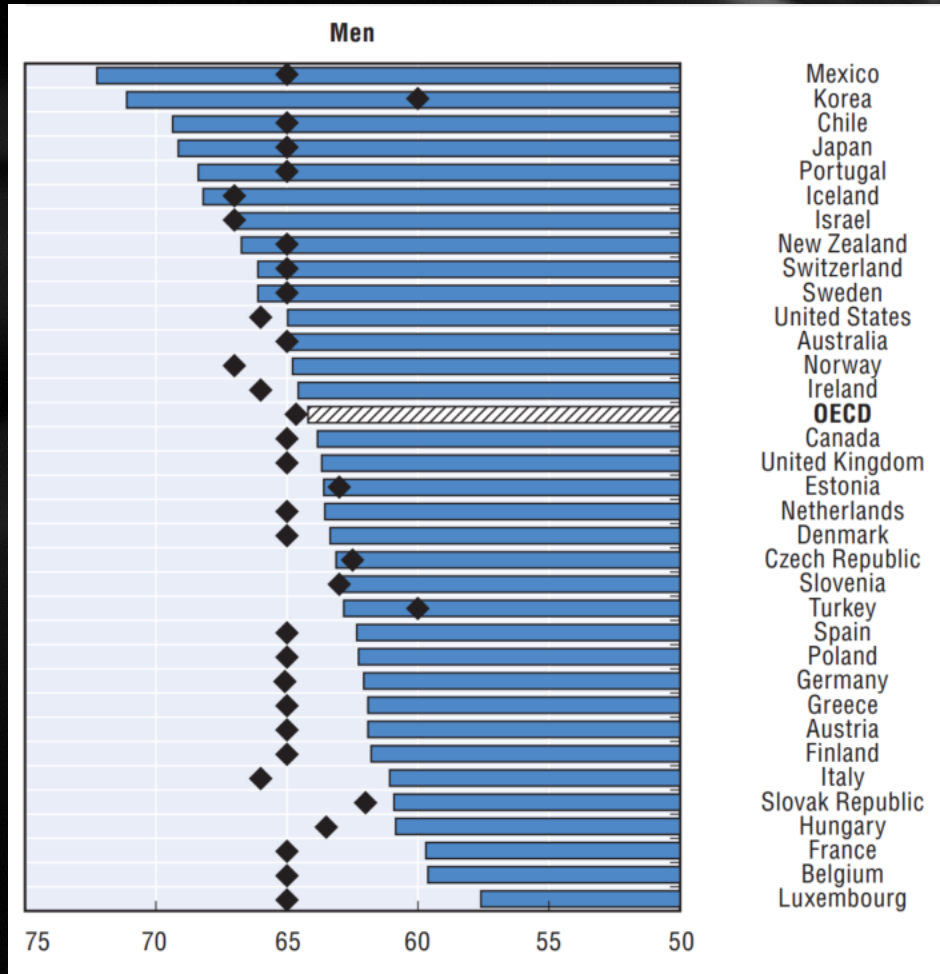
Upsides:

- Improved quality of life

Downsides:

- Forcing older workers out of labor force exacerbates old-age dependency ratio.
- Redistribution of existing jobs imposes job training and administrative costs, and the loss of consistency and continuity of workers.

Effective vs Official Retirement Age



Retraining and Curricular Innovation

Options:

- Expand subsidized higher education
- Online educational competency-based educational models
- Focus on high-end liberal arts skills rather than training for narrow occupations

Upsides:

- Will encourage broad versus narrow curricula
- Will make higher education more accessible

Downsides:

- Liberal arts are counterintuitive to students, parents and policy makers
- Increases fiscal burdens on state and debt burden on potentially discouraged workers

Make New Work

Options

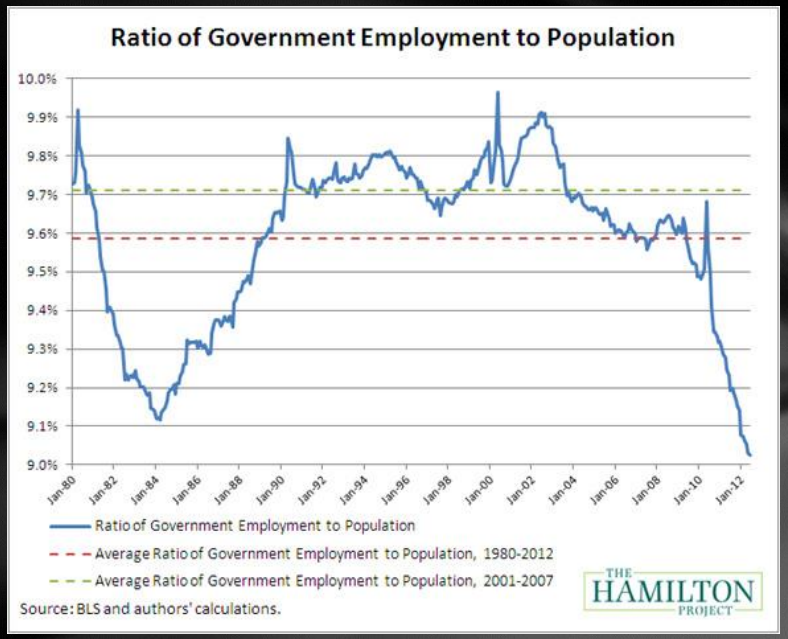
- Expand or guarantee public employment
- National service
- Subsidize private sector work

Upsides:

- Can provide needed jobs and services

Downsides:

- Increases fiscal burden
- Public sector jobs subject to same downsizing logic



Redistribution, Expansion of Safety Net

Options:

- Expand universal healthcare and other social programs
- Negative income tax or universal basic income guarantee

Upsides:

- Improved financial security

Downsides:

- Increased burdens on state
- Political opposition to "entitlements"

Conclusions

Make the Case

- unemployment and inequality is being caused by technological change
- the old age dependency ratio will be worse than expected

Prepare Transitional Policies for the Tipping Point

- Keynesian policies, safety net, educational investments and public job creation necessary to support economic growth.
- Quality of life can be improved with policies that also support growth, such as more vacation time.
- We are all going to increasingly rely on "entitlements" and redistribution.