Uncertain Future:
Understanding the Employment Impacts of Technical Change and Forming Policy Responses

Susan Houseman
Upjohn Institute for Employment Research

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Technical Change and the Future of Work: What is the Problem?

Several framings:

1) Not enough jobs in the future:

Narrative: Technological change occurring at such a fast pace, machines will displace workers. Not enough work to go around.

Policy prescriptions include social assistance for unemployed.
2) **Enough jobs, but skills mismatch:**

Narrative: Technical change leads to productivity and income growth, greater consumption and demand for workers. Enough jobs, but new jobs require different skills, causing unemployment.

Policy prescriptions focus on education and workforce skills development.
3) Employment relationship changing:

Narrative: Technical change facilitating new forms of work—workers increasingly becoming “free agents” or working flexible schedules.

Policy prescriptions include rethinking social insurance and employment regulations for workers in nonstandard arrangements.
Concerns about Technical Change Not New

- In 1961, President Kennedy created the Office of Automation and Manpower in U.S. Dept. of Labor, identifying

  “the major domestic challenge of the Sixties—to maintain full employment at a time when automation, of course, is replacing men.” (Atkinson 2018)

- Fashioning sensible requires knowing current and future trends and their causes:

  As in past, much uncertainty and misinformation
Shift in occupational and industry structure of employment:

- In U.S. rapid decline in manufacturing employment (28% drop, 5 million jobs since 2000) widely blamed on automation; fueled general concerns in U.S. about technological displacement
- But common narrative based on misreading of data; research evidence doesn’t support
- Whether technology, trade, or something else caused decline affects mix of optimal policy responses
Current Trends and the Role of Technical Change

- **Growth in inequality**
  - Common narrative: Reflects skill-biased technical change
  - But other forces (globalization, financialization of publicly traded firms) likely play important roles
  - Difficult to parse out relative importance of various factors
Current Trends and the Role of Technical Change

- **Growth of Nonstandard Work**
  - Technology-enabled flexible scheduling: 11% of employees receive less than 1 week notice about following week’s schedule (Federal Reserve, SHED)
  - Mobile apps/online platforms still account for a small share of employment, but rapidly growing.
  - But evidence from various data sources conflicting: unclear whether there has been a general increase in nonstandard work—whether issue deserves an urgent policy response.
Current Trends and the Role of Technical Change

- **Bottom line:**
  - Much uncertainty about current trends and role of technology in them.
  - Projecting future implications of technology on employment and workplace much more difficult.
The Uncertain Future: Wide Range of Estimates on Share of Jobs Affected by Technology

- **Frey and Osborne (2013):**
  - Identify 47% of all U.S. workers in jobs that are susceptible to displacement from computerization.

- **Arntz and Gregory (OECD, 2016) take task based approach**
  - Estimate 6-12% of jobs in OECD countries automatable.
  - Authors note that share of jobs affected by automation not same as employment losses:
    - Technology may create new jobs,
    - Job displacement effects depend on speed of introduction.
Case Study: Autonomous Vehicles

- Widespread agreement that AVs are coming—but still much uncertainty about their workforce effects (Groshen et al. 2018)
  - Level of disruption and its timing depend on speed of introduction of new technology, number of workers affected, and regional concentration of impacts
  - Large, concentrated employment shocks can overwhelm local economy, hamper worker adjustment
Case Study: Autonomous Vehicles: Simulations

- Direct effects estimated at 1.3 to 2.3 million jobs over next 30 years—relatively small in any year (about 100,000/yr after 2030, max impact in 2040s)
- For perspective: U.S. lost 3 million manufacturing jobs in 7 years, 8 million jobs in Great Recession

- Indirect effects: Many drive as part of job (e.g. home health aids)—employment impacts (positive/negative) uncertain
- Macro effects: May stimulate new jobs, higher demand
Policy Implications: Education

- **Given uncertainty about future, policy prescriptions today should focus on general principles and ensuring basic systems in place to help workers.**

- **Education:**
  - Implications for curricula depend on what tasks/skills made obsolete by technology—what skills complement new technology
  - Common prescription to focus more on STEM, college for all—approach being rethought in U.S.
Policy Implications: Workforce Development

- U.S. ranks at or near the bottom of OECD countries in expenditures on active labor market programs (0.09% GDP)
- Considerable support for making more robust system of adult training/lifelong learning to address changing skill demands—whether they be from technology, trade, or other factors—or to address problems of poverty.
- Congress considering proposal to appropriate $1 billion for adult skills training as part of work requirements for food assistance
Policy Implications: Employment Regulations and Protections

- Even if U.S. not experiencing strong increase in nonstandard work arrangements, evidence suggests incidence relatively high.
- Many workers outside system of social protections, many of which designed nearly 100 years ago
- U.S. cities experimenting with regulations to require minimum advance notice about work schedules
- Evidence that independent contractors arrangements growing, including technology enabled “gigs”
  - Not protected by labor and employment regulations; Don’t receive workplace benefits
  - Some consensus that “social compact” needs to be updated.
Policy Implications: More and Better Information

- Bills introduced in U.S. Congress directing
  - U.S. Department of Commerce to generate report on technology developments and adoption
  - U.S. Department of Labor to generate report on workforce implications of automation/AI