The Work Ahead

David Autor
Ford Professor of Economics at MIT
Codirector, MIT Work of the Future Task Force
September 12, 2019
Public Conversation is Filled with Alarmist Rhetoric
What’s All the Fuss About?

Across the rich world, an extraordinary jobs boom is under way

Many popular perceptions about the modern labour market are wrong

• “The Zeitgeist has lost touch with the data”

• “Many popular perceptions about the modern labour market are wrong”

• “The despondency might be justified were not popular perceptions about the world of work so obviously wrong”
The Steep Rise of Earnings Inequality in the U.S. Labor Market from 1980 to Present

Figure 1: Cumulative Change in Real Weekly Earnings of Working-Age Adults Ages 18-64

Panel A: Men

Panel B: Women

- Graduate Degree
- Bachelor's Degree
- Some College
- High School Graduate
- High School Dropout
The Parallel and then Diverging Path of Productivity and Earnings in the U.S., 1948 – 2017

Figure 2: Changes in Labor Productivity and Compensation, 1948-2016
The Work Ahead

1. What's all the fuss about?

2. The shape of the challenge

3. The geography of the challenge

4. The case for tempered optimism – and against fatalism

5. How is this time different?

6. Key policy levers
Polarization of Work

**High skill jobs**
- Rising employment in professional, technical, and managerial work

**Low skill jobs**
- Rising employment in personal services — cleaning, security, recreation, health aides

**Mid skill jobs**
- Falling employment in production work, office/clerical, and sales
Among College Workers, Most Occupational Relocation is **Upward**

But Among Non-College Workers, Occupational Mobility is Almost Exclusively **Downward**
The Work Ahead

1. What's all the fuss about?
2. The shape of the challenge
3. **The geography of the challenge**
4. The case for tempered optimism – and against fatalism
5. How is this time different?
6. Key policy levers
Occupational Shares among Non-College Workers 1970

Occupation Shares among Non-College Adults: High School or Below
(Level Relative to 1970 Mean)

- No Occupational Skill Gradient Remaining
  - Mid-skill work as scarce in cities as rural areas
  - Low-skill work as prevalent
No Occupational Skill Gradient Remaining

- Mid-skill work as scarce in cities as rural areas
- Low-skill work as prevalent
Occupational Shares among Non-College Workers 1970 – 1990

No Occupational Skill Gradient Remaining

- Mid-skill work as scarce in cities as rural areas
- Low-skill work as prevalent
Occupational Shares among Non-College Adults: High School or Below
(Level Relative to 1970 Mean)

No Occupational Skill Gradient Remaining

- Mid-skill work as scarce in cities as rural areas
- Low-skill work as prevalent
Occupational Shares among Non-College Workers 1970 – 2015

- No Occupational Skill Gradient Remaining
- Mid-skill work as scarce in cities as rural areas
- Low-skill work as prevalent
Changes in Production and Administrative Work

There has been a decline of production jobs (majority male) and administrative/clerical jobs (majority female)
• There has been little change in occupational distribution of college workers.

Occupational Shares among College Workers 1970 – 2015
It's not that there's more low-paid work in cities, it's that there's less middle-paid work.
Urban Areas Have Become Much More Educated Since 1980

College Educated Share of Working-Age Population

1950: 5 pct points
1970: 5 pct points
1980: 8 pct points
1990: 13 pct points
2000: 17 pct points
2015: 20 pct points
College vs. Non-College Wages 1970 and 1980

- Paralleling the decline of middle-skill urban jobs
- Fall in the urban wage premium for non-college workers
- Especially pronounce after 2000
Paralleling the decline of middle-skill urban jobs

Fall in the urban wage premium for non-college workers

Especially pronounce after 2000
The Work Ahead

1. What's all the fuss about?
2. The shape of the challenge
3. The geography of the challenge
4. The case for tempered optimism – and against fatalism
5. How is this time different?
6. Key policy levers
The U.S. Stands Out for both Its Extremes of Rich and Poor and Its Low Rate Intergenerational Mobility

Figure 3: Earnings Inequality and Economic Mobility: Cross-National Relationships
Demographic Trends Point Toward Increasing Labor Scarcity

Figure 4: The Working-Age Share of the U.S. Population is Contracting
The Work Ahead

1. What's all the fuss about?
2. The shape of the challenge
3. The geography of the challenge
4. The case for tempered optimism – and against fatalism
5. How is this time different?
6. Key policy levers
Is this Time Different?

Employment Polarization

So-So Technologies

- The era of digitalization has not delivered comparable gains in productivity as other eras
- Both labor-substituting and labor-complementary technologies can raise productivity
- Most workplace technologies do both
- Not all innovations that raise productivity displace workers, and not all innovation that displace workers substantially raise productivity
  - Electric lighting – labor complementing
  - Self-checkout kiosks – labor substituting
- So-so technologies are one explanation for why we haven't seen stronger productivity growth; disrupt employment, displace workers but little boost to productivity
Workplaces of the Future: Automation, Robotics, and Artificial Intelligence

• Industrial robots – Concentrated effects
• Beyond the factory floor – Robots in warehouses, hospitals, and retail stores
• Worker scarcity – Not too many production workers, too few
• Robots can displace or collaborate or both – Collaborative robots
• Artificial Intelligence – A component of robotics but broader reach b/c software-only
• Machine Learning – Differs from previous waves of automation in that it applies to high- as well as low-education jobs and can learn as it works
• Autonomous vehicles – More than 3 million commercial vehicle drivers in U.S.
• Rapid and total transition to vehicle autonomy – Would be highly disruptive, appears highly unlikely
• Automation that complements rather than entirely replaces human drivers for many years, except in special settings (mines, closed private roadways)
The Work Ahead

1. What's all the fuss about?
2. The shape of the challenge
3. The geography of the challenge
4. The case for tempered optimism – and against fatalism
5. How is this time different?

6. Key policy levers
Skilling for the Future

Four powerful undercurrents…

1. Entering period of labor scarcity due to low fertility, large Baby Boom cohorts retiring, restrictive immigration policies

2. Rapidly rising educational attainment will reduce supply of young, able-bodied workers to blue-collar and personal service occupations

3. Rapidly aging population creates enormous job growth in care sector

4. Substantial replacement hiring even in contracting occupations such as production work, trades, driving occupations, etc.
Skilling for the Future

What we know

- **Most at risk** are those who lack strong technical training or 2 or 4-year degrees or more
- **Train for new middle skill jobs** (health tech) + replacement hiring in traditional middle-skill jobs (production work, trades)
- **Build on what we know works**: Community colleges, augmented with wraparound services

Innovation needed

- Expanding **traditional apprenticeship** programs
- **Non-traditional sector-based** training programs
- Online learning
- Bootcamps
- ‘**Credentials**’ of all sorts
Four Policy Areas to Prioritize

“If You Skill Them, Jobs Will Come” is Insufficient

1. Rebalancing fiscal policies away from subsidizing investment in physical capital and toward catalyzing investment in human capital

2. Restoring the role of workers as stakeholders, alongside owners and stockholders, in corporate decision-making

3. Fostering technological and organizational innovation to complement workers

4. Reinvigorating America’s leadership position in technology and innovation
Thank You
The Work Ahead

David Autor
Ford Professor of Economics at MIT
Codirector, MIT Work of the Future Task Force
September 12, 2019