Unemployment Fluctuations and Job Polarization: Evidence from France and the US in the Great Recession

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THEMA

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Are machines taking over the job market?

Modern Times (1936)
Old question

Luddites. 1811-1812. UK
Technological revolution: Computers and ICT

Machines are substitutes for human brain
Technological revolution

Machines replace human labor

- Jobs involving repetitive tasks: "routine jobs"
- Hard and dull jobs disappear (in the factory and in the office)
  - bookkeeping, clerical work, and repetitive production tasks
  - routine tasks are increasingly codified in computer software and performed by machines or, alternatively, sent electronically to foreign worksites to be performed by comparatively low-wage workers.
- They happen to be in the middle of the wage distribution
Humans still outperform machines in 2 activities

- Creative, problem-solving, and coordination tasks
  → Managers, top business and financial occupations, professionals
  → high-skill workers, top-paid jobs, "Abstract jobs"

- In-person interactions, situational adaptability, manual dexterity, visual and language recognition
  → security personnel, personal care workers, cleaners, janitors, home health aides, assisting or caring for others
  → low-skill workers, low-paid jobs, "Manual jobs"
Job polarization

The labor market is polarizing

- Employment growth in Abstract (high-skill, high-wage jobs) and Manual jobs (low-skill, low-pay jobs)
- Disappearance of Routine jobs
  - "Under pressure: The squeezed middle class" (OECD, 2019)
Job polarization in the US

Figure: Employment growth by skill. Autor and Dorn, AER 2013
Job polarization in the US

Figure: Employment growth by skill. Autor and Dorn, AER 2013
Job polarization in Europe

Figure: Change in employment shares by occupation in 16 European countries. Occupations grouped by wage tercile: Low, middle, high, 1993-2006.
What we do: Originality of our work

- Short-run effects of the secular trend
  - Intuition: Job losses during the 2008 recession were mainly concentrated among middle-skill workers in the US, the same group that has suffered the most from the disappearance of routine jobs.
  - Does job polarization accelerate in recession?

- Interaction between job polarization and labor market duality?
  - Intuition: manual jobs are more "unstable"
  - OECD: "Non standard work" (not full-time, not permanent contract)
What we do: 1. stocks and 2. flows

1. **Stocks**: Number of people that are:
   - employed $E$
   - 3 tasks $A$, $R$, $M$
   - 2 types of jobs: standard/non-standard $N$, $NS$
   - unemployed $U$
   - not in labor force or inactive $N$

$= 8$ labor market status

$E^{AS-S}, E^{A-NS}, E^{R-S}, E^{R-NS}, E^{M-S}, E^{M-NS}, U, N$
Job polarization in France: Duality

Figure: Employment growth by task in France. Authors’ calculation. LFS 2003-2016
Job polarization in the US

Figure: Employment growth by task in the US. Authors’ calculation. LFS 2003-2016
What we do: 1. stocks and 2. flows

1. 8 labor market status
2. **Worker flows**
   - Labor market transition from 1 labor market status to the other
   - "stock-flow fallacy": a stock might appear constant, with large inflows and outflows
   - We want to understand the ins and the outs
   - **Method**
     - Quarterly labor force surveys
     - Match individuals across survey
     - Look at their labor market transition from 1 quarter to the next
Worker flows

Quarter 1  Quarter 2

Individuals in the survey
Worker flows

Quarter 1

EA - S
Employed in abstract job
Standard work

Quarter 2

EA-S? EA-NS
ER-S? ER-NS?
EM-S? EM-NS?
U?
NiLF?
Worker flows

Quarter 1

- EA - S
  Employed in abstract job
  Standard work

- ER-NS
  Employed in routine job
  Non-standard work

Moving up the ladder
Stepping-stone
Job loss
Leaving the labor force

Quarter 2

- EA - S? EA-NS
  ?
  ER-S? ER-NS?
  EM-S? EM-NS?
  U?
  NiLF?

Individuals in the survey

CFS (THEMA) Paris Seine 2019
Worker flows

Measuring labor flows

For each labor market status...

Quarter 1

Quarter 2

Employed in abstract job
Standard work

Moving up the ladder

Unemployed

Leaving the labor force

Discouraged worker

Exception

etc...

Job finding

\( \text{EA-S? EA-NS?} \)
\( \text{ER-S? ER-NS?} \)
\( \text{EM-S? EM-NS?} \)
\( \text{U?} \)
\( \text{NiLF?} \)

\( \text{EA - S} \)

Employed

in abstract job

Standard work

\( \text{ER-NS} \)

Employed

in routine job

Non-standard work

\( \text{U?} \)

\( \text{NiLF?} \)
Measuring labor flows

Worker flows

Individuals in the survey

Quarter 1

Quarter 2

Employed in abstract job
Standard work

Unemployed

Moving up the ladder
Stepping-stone
Job loss
Leaving the labor force
Job finding
Discouraged worker

(8,8) Markov Transition matrix
Labor market dynamics
Decomposition of Unemployment changes

(8,8)

Employed in routine job
Non-standard work

Unemployed

etc ...

CFS (THEMA)
Paris Seine 2019
Results:

Table: Unemployment changes 2003Q1-2016Q4

<table>
<thead>
<tr>
<th></th>
<th>France</th>
<th>US</th>
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<tbody>
<tr>
<td><strong>Job loss</strong></td>
<td>23.7</td>
<td>24.3</td>
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<tr>
<td>RS-U</td>
<td>12.6</td>
<td>13.3</td>
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<td>RNS-U</td>
<td>7.7</td>
<td>2.8</td>
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<td><strong>Job Finding</strong></td>
<td>41.2</td>
<td>47.8</td>
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<td>U-RS</td>
<td>9.1</td>
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<td><strong>Inactivity</strong></td>
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Conclusion

Research agenda on job polarization

- Paris Seine Initiative (2017)
- ANR: TOPAZE (2018-2022)
  - 3 institutions: Thema, Essec, Science Po Paris
  - 18 researchers, in France and abroad
  - 338 150 euros
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