

Economic Stimulus at the Expense of Routine-Task Jobs

Tuzel and Zhang

Julien Sauvagnat

Bocconi University

June 2019

The paper in a nutshell

- ▶ Tests the following hypothesis:
 $\searrow p_K \implies \searrow$ Routine-task employment
- ▶ Uses changes in state-level section 179 deduction limits as changes in implicit subsidies to p_K
- ▶ Finds that an increase in the deduction limit is associated with:
 - ▶ an immediate increase in the stock of computers
 - ▶ no effect on total employment
 - ▶ an immediate increase in skilled labor
 - ▶ a gradual decrease in routine-task labor

Motivation - How does $\frac{p_K}{w}$ affect $\frac{K}{L}$?

- ▶ Hicks 1932 "*The theory of Wages*":

"a change in the relative prices of the factors of production is itself a spur to invention, and to invention of a particular kind - directed to economizing the use of a factor which has become relatively expensive"

- ▶ An old concern:

Luddites (\approx 1810s): English textile workers destroying textile machinery around Nottingham

- ▶ Traction among decision-makers in the context of investment incentives policies. Robert Reich, former U.S. Secretary of Labor, in response to an accelerated depreciation policy proposed in 2010:

"Republicans and corporate lobbyists have been demanding tax cuts on corporate investments for one reason: Big corporations are investing in automated equipment, robotics, numerically-controlled machine tools, and software. These investments are designed to boost profits by permanently replacing workers and cutting payrolls. The tax breaks Obama is proposing would make such investments all the more profitable."

Related Work

Other empirical studies have estimated the effects of the Section 179 deduction limits program on investment and employment outcomes.

- ▶ Zwick and Mahon 2017 AER

“Tax Policy and Heterogeneous Investment Behavior”

- ▶ Measures directly PV(investment deductions) from firms' tax returns (larger for assets with long duration)
- ▶ More generous deductions associated with more investment
- ▶ and an increase in wages

- ▶ Garrett, Ohrn, and Suárez Serrato 2019 AER: Insights

“Tax Policy and Local Labor Market Behavior”

- ▶ Identification at the local labor market level
- ▶ Exposed areas are those with high employment shares in industries with long asset duration
- ▶ Positive effect on total employment

This Paper

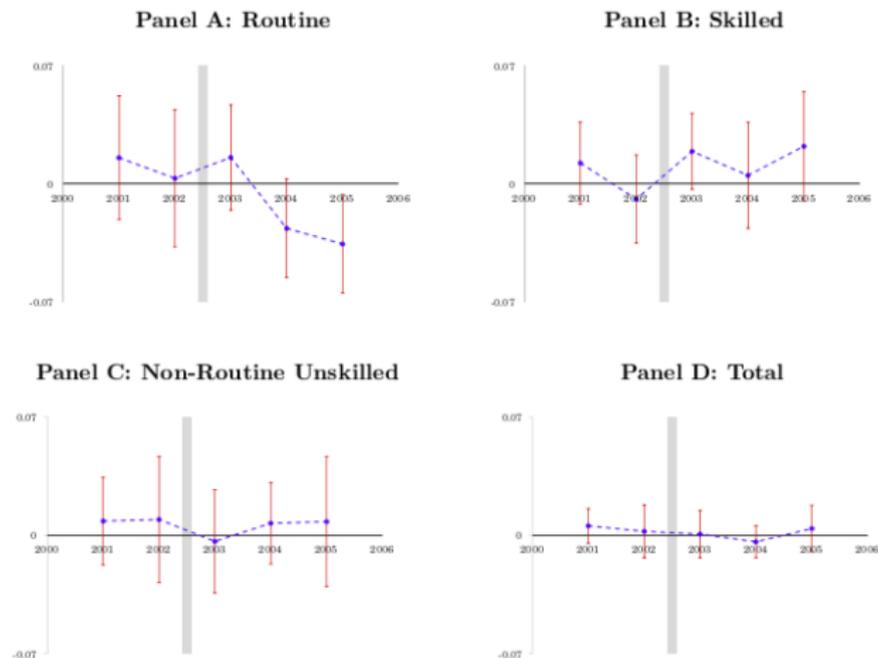


Figure 4. Estimated employment effects of increased Section 179 deduction limits in 2003.

Figure 2: Effects of Bonus Depreciation by Exposure to Long Duration Industries

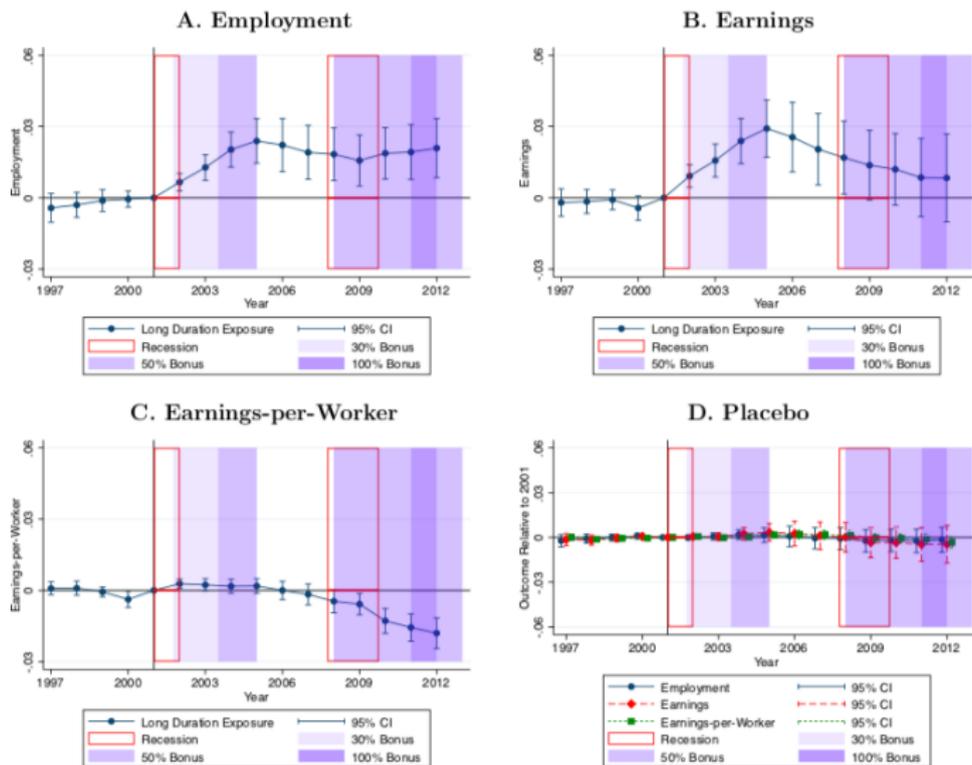
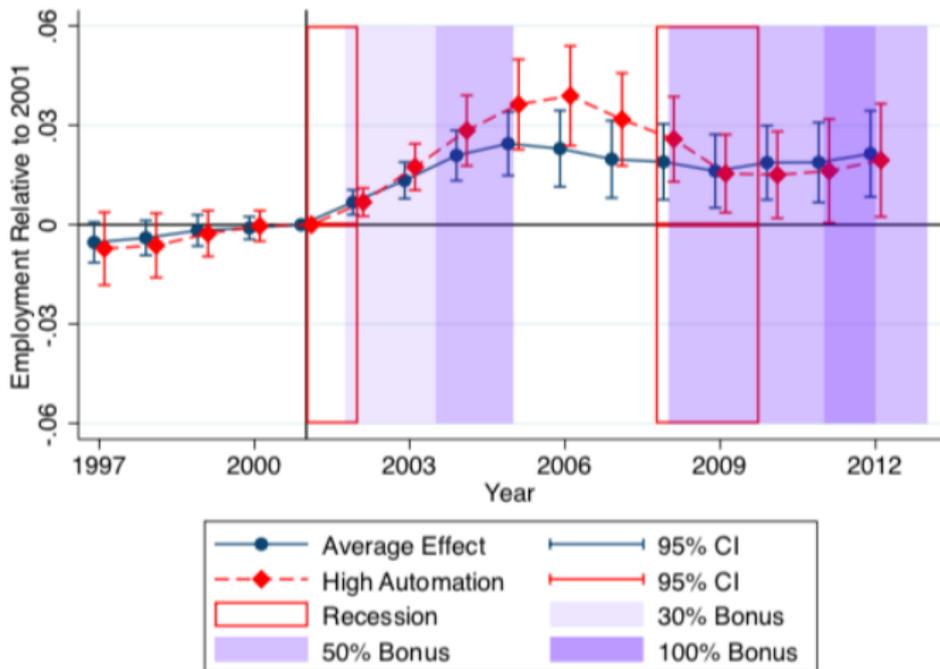


Figure 3: Heterogeneity by Automation Likelihood



What is the paper really about?

(a) $\searrow p_K$ of equipment capital $\implies \searrow$ Routine-task employment ?

(b) $\searrow p_K$ of computers $\implies \searrow$ Routine-task employment ?

(c) Economic stimulus $\implies \searrow$ Routine-task employment ?

The setting indicates (a), but the analysis/title tilt towards respectively (b) or (c).

Which types of investment substitute routine-task employment?

- ▶ The paper focuses on computers
- ▶ However, other types of (routine-labor replacing) investment are also eligible (for section 179 deduction limits)



- ▶ Different types of investment displace/complement different types of jobs
- ▶ For instance, computers/administrative occupations versus industrial robots/production workers

The cross-section of routine occupations

APPENDIX TABLE 2—RANKINGS OF OCCUPATIONS WITH HIGHEST AND LOWEST ROUTINE INTENSITY

| Panel A. Occupations with highest RTI scores | | Panel B. Low-skill occupations with lowest RTI scores | | Panel C. High-skill occupations with lowest RTI scores | |
|--|-------------------------------------|---|---|--|--|
| 1 | Butchers and meat cutters | 1 | Bus drivers | 1 | Fire fighting, prevention and inspection |
| 2 | Secretaries and stenographers | 2 | Taxi cab drivers and chauffeurs | 2 | Police and detectives, public service |
| 3 | Payroll and timekeeping clerks | 3 | Waiters and waitresses* | 3 | Primary school teachers |
| 4 | Bank tellers | 4 | Truck, delivery, and tractor drivers | 4 | Managers of properties and real estate |
| 5 | File clerks | 5 | Door-to-door/street sales, news vendors | 5 | Secondary school teachers |
| 6 | Cashiers | 6 | Carpenters | 6 | Electrical engineers |
| 7 | Typists | 7 | Telecom and line installers and repairers | 7 | Physicians |
| 8 | Pharmacists | 8 | Housekeepers, maids, butlers, and cleaners* | 8 | Computer systems analysts and scientists |
| 9 | Bookkeepers, accounting clerks | 9 | Health and nursing aides* | 9 | Civil engineers |
| 10 | Postal clerks, except mail carriers | 10 | Electricians | 10 | Industrial engineers |

Notes: Asterisk denotes low-skill service occupations. The Routine Task Index (RTI) is defined as $RTI = \ln(R) - \ln(M) - \ln(A)$ where R, M, and A are occupation-level measures for routine, manual, and abstract tasks derived from the *Dictionary of Occupational Titles (DOT) 1977*. Low-skill occupations in panel B include

Acemoglu and Autor 2011 distinguishes between:

Routine-cognitive occupations (e.g. administrative and sales occupations)

Routine-manual occupations (e.g. production workers)

Interpretation: replaced or more productive?

Hershbein and Kahn AER 2018

Do Recessions Accelerate Routine-Biased Technological Change? Evidence from Vacancy Postings

(Negative) local employment shocks associated with more computer adoption, and with increases in skill requirements within occupations

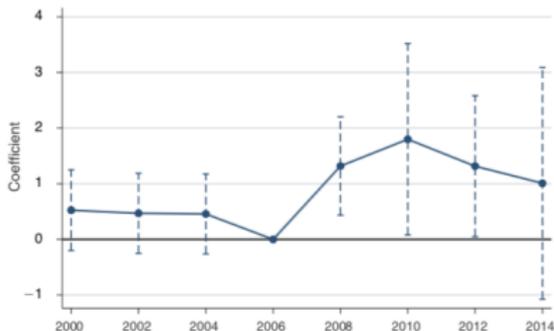


FIGURE 4. PC ADOPTION AND THE MSA-EMPLOYMENT SHOCK

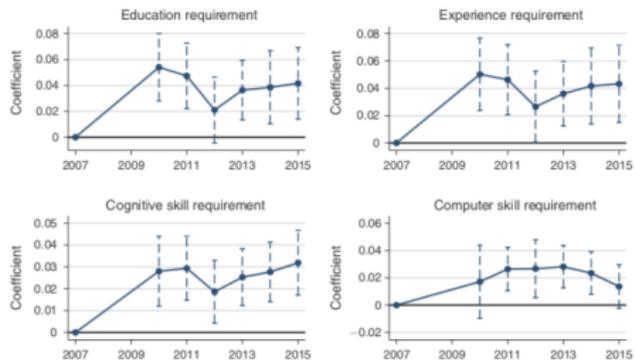


FIGURE 2. SKILL REQUIREMENTS AND THE MSA-SPECIFIC EMPLOYMENT SHOCK

Interpretation: replaced or more productive?

Routine-cognitive occupations appear to have become both relatively higher-skilled and more productive.

Routine-manual occupations strongly hit instead, consistent with readily replaced.

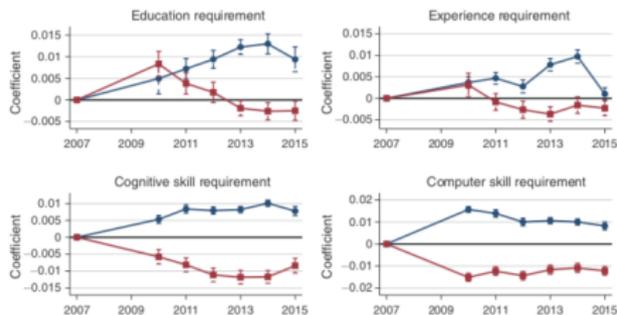


FIGURE 6. DIFFERENTIAL UPSKILLING FOR ROUTINE OCCUPATIONS

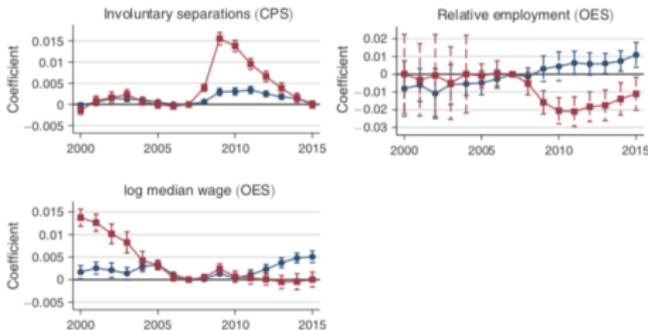


FIGURE 7. DIFFERENTIAL EMPLOYMENT AND WAGE EFFECTS FOR ROUTINE OCCUPATIONS

Conclusion

- ▶ Nice paper. Enjoyed reading it.
- ▶ Main suggestion:
 - ▶ Dig deeper into the cross-section of occupations
- ▶ Thank you!