Trade Adjustment: Worker Level Evidence

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Roadmap

- Introduction and motivation
- Data and technical considerations
- Impact of trade exposure on earnings and employment
  - Cumulative earnings, years worked and earnings per year
  - Mobility across firms, industries and sectors
  - Geographical mobility
  - Social Security Benefits
- Heterogeneity in worker adjustment
  - Labor Force Attachment
  - Tenure and Age
- Alternative measures of trade exposure
  - Industry-level and Region-level
  - Alternative measures of Industry-level exposure
Introduction and motivation

What is the paper about?

Theoretical question: globalization and the effect on labor force...

Empirical answer: China and manufacturing sector in the U.S.

Main findings.
Introduction and motivation

Figure I
Studying the effects of IT on earnings and employment through:

1. Industry shocks by import competition from China.

2. Longitudinal data on individual earnings by employer (SSD) \( \sim 500,000 \) individuals (expanded \( \sim 800,000 \)).


Great advantage: lots of possibilities to control for.
Data and technical considerations

- How to measure trade exposure? The import penetration ratio:

$$\Delta IP_{j,\tau} = \frac{\Delta M_{j,\tau}^{UC}}{Y_{j,91} + M_{j,91} - E_{j,91}}$$

- $\Delta M_{j,\tau}^{UC}$: change in imports from China 1991-2007

- How to control for domestic shocks in the U.S.? Use non-U.S. high income countries:

$$\Delta IPO_{j,\tau} = \frac{\Delta M_{j,\tau}^{OC}}{Y_{j,91} + M_{j,91} - E_{j,91}}$$
Data and technical considerations

Figure II
Trade Exposure and Production Worker-Intensity by Industry.

Notes: Numbers in parentheses in the legend indicate average growth of import penetration within industry group, weighted by 1991 employment. Values for growth of import penetration are Winsorized at 100.
Impact of trade exposure on earnings and employment

Five main worker outcomes:
1. Total labor earnings.
2. Number of years with positive labor earnings.
3. Earnings per year for years earnings > 0.
4. Total self-employment income.

Baseline model: $$\tilde{E}_{ij\tau} = \beta_0 + \beta_1 \Delta IP_{j,\tau} + \beta_2 IP_{j,\tau} + X'_{ij,0}\beta_3 + Z'_{j,0}\beta_4 + e_{ij\tau}$$

- $$X_{ij,0}$$: controls for gender, birth, age and foreign-born.
- $$Z_{j,0}$$: controls for economic cond. in industry j.
Impact of trade exposure on earnings and employment

Key factors:
- Threat: Product demand shocks correlated across high-income economies.
  - Corrected through gravity-based approach.
- Threat: Growth in imports due to technology shocks.
  - Corrected through initial industry-level controls.
- Workers with similar socioeconomic characteristics.
- Exposition through initial industry and region of residence.
- Progressive analysis adding different controls.
Total reduction in earnings over 16 years for 75th most exposed worker: 38% of initial annual earnings.

Effects for individuals on manufacturing sector in 1991:

- ∇ Cumulative earnings: 1/2 of initial annual wage for the 75th percentile exposed worker w.r.t. 25th (75/25) due to:
  - ∇ 2.6% annual earnings for 75/25: → combination of less earnings/h and # of hours worked
  - Not from unemployment!
  - Not due to long-term decline of manufacturing in U.S.!

- Δ Risk public disability benefits.

- ∇ Hours worked for initial employer.

- ∇ Hours worked in initial two-digits manufacturing industry.

- Δ Hours worked elsewhere in manufacturing and outside manufacturing.
Impact of trade exposure on earnings and employment

Figure III
Cumulative Earnings and Cumulative Job Churning since 1991
Impact of trade exposure on earnings and employment
Impact of trade exposure on earnings and employment

- What about geographical mobility? Use of commuting zones.
  - Negative impact for cumulative earnings independently of geographical difference between initial and final commuting zone.
  - Geographical mobility has limited importance.

- Social Security Benefits as a Channel of Adjustment.
  - Modest effect on the aggregate.
  - SSDI only replace \( \sim 5\% \) of income lost to trade exposure.
  - SSDI is important for less attached workers.
Heterogeneity in worker adjustment

- High versus Low Labor Force Attachment Workers:
  - Extend sample to include also part-time and temporary workers (low attachment).

- Negative effect on years with main income from labor earnings for low $\Delta60\%$ w.r.t. high attachment.

- $\Delta160\%$ in cumulative years with SSDI as main income source for low w.r.t. high attachment.

- $\Delta120\%$ in coeff. on ever receiving SSDI as main income source for low w.r.t. high attachment.

$\rightarrow$ Low attachment are more likely to exit labor force $\rightarrow$ rely more on SSDI.
Heterogeneity in worker adjustment

- High (≥ 5 years) versus Low (< 5 years) Tenure Workers, Young vs Older:
  - Average trade exposure for low-tenure is 1/4 larger.
  - Effect of trade exposure on low-tenure on cumulative earnings is 8.7 times as large for high-tenure.
  - Low-tenure experience ×2 reduction in employment years and ×3 for loss in earnings at initial firm as high-tenure.
  - High-tenure offset losses in cum. earnings through employers outside initial sector. Not true for low-tenure.
  - Is it because they tend to be young? Comparing cohorts (22-35 and 36-49) → No!
Heterogeneity in worker adjustment

- Differences in Adjustment by Earnings Capacity.
  - Use terciles by annual pre-exposure earnings (1988-1991) w.r.t. others in their age-cohort.

- Low-wage at 75th perc. of exposure lose 1.2 extra years of initial annual earnings over the period w.r.t. 25th.
  - $\times 3$ as large as impact for full sample
  - For middle-tercile is $1/2$ of bottom-tercile, and for top-tercile impact is 0.

- Why these large differences? Is it a decline of firm’s demand for low-skilled workers?
  - No! What differs is subsequent labor adjustment!
  - High-wage move out of impacted sector → 1/4 of losses recovered in same sector, 3/4 outside manufacturing.
Heterogeneity in worker adjustment

- Differences in Adjustment by Earnings Capacity.
  - All workers have reductions in years of employment at initial employer. But the response is different:
    - Low-wage offset lost employment through employment in manufacturing sector.
    - Middle-wage both inside and outside.
    - High-wage outside manufacturing.

- What about earnings per year?
  - Low and middle-wage negatively affected both at initial firm and with subsequent employers.
  - High-wage have no adverse earnings effects. Why?
Alternative measures of trade exposure

- Exposure to trade competition not only in industry, but also in local labor market. Then re-estimate for 6 alternative measures of industry-level trade shocks.

- Using commuting zones (low-correlated with industry-level exposure):
  - CZ with higher trade exposure have lower cumulative earnings.

- Comparing 75/25 industry vs 75/25 regional trade exposure
  - More exposed industry with 40.5% lower cumulative earnings vs 19.7% in more exposed CZ.

- Earnings/year fall, but years worked increase!
  - Income effect? We only use high-attachment sample.
  - Earning losses due to exposure occur in initial CZ, while industry losses are more dispersed.
Alternative measures of trade exposure

- Alternative measures of industry-level trade exposure
  2. Other low-income countries.
  3. Other destination markets.
  5. Factor content of trade.

- All have negative significant effects over cumulative earnings!
Conclusions

- Effects for individuals on manufacturing sector in 1991:
  - $\nabla$ Cumulative earnings.
  - $\Delta$ Risk public disability benefits.
  - $\nabla$ Hours worked for initial employer.
  - $\nabla$ Hours worked in initial two-digits manufacturing industry.
  - $\Delta$ Hours worked elsewhere in manufacturing and outside manufacturing.

- Earning losses are larger for:
  - Low initial wage workers $\rightarrow$ stuck in manufacturing, being exposed.
  - Low initial tenure workers.
  - Low attachment labor force.

- Summarizing: import shocks impose large labor adjustment costs... and are unevenly distributed across:
  - Skill levels.
  - Conditions of employment in pre-shock period.
THE END