

# Trade, Technology and Employment

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# Intro

Key concept: The channel through which trade affects empl. is much similar to how tech affects empl: it has to do with task *routinisation*.

Why this topic

Main background papers:

- Import Competition and the Great US Empl. sag; Acemoglu et al. (2016)
- **Untangling trade and tech** ; Autor et al. (2015)
- Why are there still so many jobs? Autor (2015)
- **Trade adjustment: worker-level evidence** ; Autor et al. (2014)
- Employment, skill structure and int. trade; Biscourp and Kramarz (2007)
- Trade, wages and collective bargaining (France); Carluccio et al. (2015)
- The march of the techies; Harrigan et al. (2016)
- Trade and inequality; Helpman et al. (fort)

# Untangling trade and tech, Autor et al 2015 (I)

## Aims:

- analyse the simultaneous impacts of tech and trade on US employment levels and job composition, juxtaposing their effects across local labour markets, over time, between sectors and occupations, and controlling...

## Key concept magnified: why trade, tech and empl are entangled

- 1 trade liberalization is simultaneous to (continuing) tech. change
- 2 falling trade cost facilitate offshoring, factors remaining are more productive
- 3 *routinisation*: job tasks suitable for automation are also for offshoring

## Untangling trade and tech, Autor et al 2015 (II)

Findings: Distinct effect of tech and trade on labour market

- Import competition leads to sharp decline in local manuf empl., whether exposure to routine task (automation) has no effects on empl
- Effects of tech and trade on empl vary across industries and occupational categories
- Different trends for tech and trade. Effect of trade competition harsher in more recent years, while effect of tech. change on empl in manuf is declining

Critical variables/data (*Id. Strategy*)

- Local labor market as proxied by Commuting Zones (CZ)
  - change in empl. structure within 722 US CZ
- Proxy for techn. change / automation
  - Census data on industry and occupation mix *and* Dictionary of occupation titles
  - enable to measure degree to which CZs were historically specialized in routine, codifiable activities, suited to automation

## Untangling trade and tech, Autor et al 2015 (III)

Exposure to automation/computerisation (also check Autor 2015)

- Using the job task description, for each activities a Routine Task Intensity (RTI) is computed
- Such measure is *rising* with the importance of routine and *declining* with manual and abstract task
- $\Rightarrow$  Manual tasks should not be affected; routine tasks are; abstract tasks are not
- Each CZ is assigned a Routine SHare (RSH)

Exposure of local labor market to trade

- change in Chinese import exposure per worker in a region (IPW), where imports are assigned to each region according to its share of national industry empl (*a bit weaker...*)
- IV strategy: since one wants to capture supply-side shocks from Chinese import (and not US demand shock) consider the growth of Chinese imports in 8 large economies

## Untangling trade and tech - Emp. Setting (IV)

$$\Delta Y_{jkt} = \gamma_t + \beta_1 \Delta IPW_{jt}^{\text{China-US}} + \beta_2 RSH_{jt} + \mathbf{X}'_{jt} \boldsymbol{\beta}_2 + \delta_k + e_{jkt}.$$

- Dependent Var: decadal change empl-to-population ratio
- Dep Vars: contemporaneous change in IPW and start of period RSH, both measured at CZ level
- Controls: time period effects, differential empl patterns across regions, demographics, etc

# Untangling trade and tech - Results (V)

Table 1

*Effect of Exposure to Chinese Import Competition and Routine-biased Technological Change on Employment Status among Working Age Population, 1990–2007: 2SLS Estimates*

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Dependent variable: 10-year equivalent changes in share of working age population in indicated employment status (in percentage points)

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	(1)	(2)	(3)
<i>Panel (a): outcome: share employed</i>			
Share of employed in routine occupations	-0.05 (0.22)		-0.21 (0.25)
( $\Delta$ imports from China to US)/Worker		-0.70** (0.16)	-0.83** (0.22)
<i>Panel (b): outcome: share unemployed</i>			
Share of employed in routine occupations	-0.01 (0.06)		-0.01 (0.07)
( $\Delta$ imports from China to US)/worker		0.21** (0.06)	0.19** (0.05)
<i>Panel (c): outcome: share not in labour force</i>			
Share of employed in routine occupations	0.06 (0.17)		0.21 (0.19)
( $\Delta$ imports from China to US)/worker		0.49** (0.15)	0.65** (0.19)

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*Notes.*  $N = 1,444$  (722 commuting zones  $\times$  2 time periods). All regressions control for the start of period levels of share of employment in manufacturing, share of population that is college educated, share of population that is foreign born, employment rate among females and Census division dummies. Robust standard errors in parentheses are clustered on state. Models are weighted by start of period commuting zone share of national population. \*  $p \leq 0.05$ , \*\*  $p \leq 0.01$ , \*\*\*  $p \leq 0.10$ .

## Untangling trade and tech - Results (VI)

### Main results

- Col (1) no robust relationship between tech. exposure and change in empl.
- Col (2) significant (negative) effect of import exposure

### Results not reviewed here

- There are low skill jobs that due to their flexibility are hard to automatize

Note to self: very well written and really good interpretation of coefficients!



# References I

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