On the Persistence of the China Shock

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A Major Issue of Our Time: Increasing (and Persistent) Joblessness in Former Manufacturing Regions

Change in Employment-Population Ratio, 2000 to 2019



Note: Change in emp.-pop. ratio by commuting zone for ages 18-64, 2000 Census and 2017-2019 ACS.

Import competition and job loss

- In regions more exposed to the China trade shock
 - Acute adverse economic consequences
 - Substantial declines in mfg employment
 - Little adjustment in non-mfg employment, population headcounts
 - Larger declines in earnings for low-wage workers
 - Greater takeup of government transfers
 - Mounting social and political consequences
 - · Increased rates of mortality, single-headedness, child poverty
 - Stronger right-wing political shift in harder hit (white) areas

The China Trade Shock in the Longer Run

- How permanent are adverse impacts in harder hit regions?
 - Over time, does employment recover? Do workers leave distressed regions? Do government transfers offset lost income?
- How does the China shock compare to other major shocks?
 - Are duration and intensity of impacts comparable to those caused by the decline of coal or the Great Recession?
- How many regions suffered absolute declines in real income?
 - How do small, positive welfare gains predicted by GE models compare to regional variation in shock impacts on income?



1 Duration of China Trade Shock

2 Enduring Impacts on Employment, Population, Income

- **(3)** Why Were Shock Impacts So Long Lasting?
- **4** Uniqueness of the China Shock
- **5** Assessing Welfare Impacts
- 6 Discussion

Reform-Driven Forces behind the China Trade Shock

• Deng's southern tour (1992), China's WTO accession (2001)

- Reduced input tariffs, export restrictions, policy uncertainty
- Eased limits on FDI and MNEs, consolidation of SOEs
- Rural to urban migration and reduced spatial misallocation

- Temporary suppression of RMB
- Residual productivity growth
- The Chinese state strikes back (2008-)
 - End of transition-era productivity growth
 - Hu and Xi progressive rollback of reforms

China Trade Shock in Three Acts: Initiation (1991-2000), Intensification (2001-2010), Stabilization (2010-2019)

Import penetration in US market: China alone and China + SE Asia



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Commuting Zone Level Regression Analysis

 Commuting Zone *i*, initial period t = 2000, h = 1,..., 19 (time-differenced regressions of 1 to 19 years in length)

$$\Delta Y_{it+h} = \alpha_t + \beta_{1h} \Delta I P_{i\tau}^{cu} + \mathbf{X}'_{it} \beta_2 + \varepsilon_{it+h}$$

- $\Delta Y_{it+h} = \text{change in outcome}$
 - Employment-population ratio, log population headcount, log personal income per capita, log gov't transfers per capita
- $\Delta IP_{i\tau}^{cu}$ = change in Chinese import penetration over 2000-2012
 - Instrument following approach in ADH '13, AADHP '16
- X_{it} = Census region time trends, initial-period controls
 - CZ emp. shares for manuf., women, routine, offshorable jobs; pop. shares for college-educated, foreign-born, non-white, age cohorts

Econometric Issues

- Issues addressed in the paper
 - Varying length of the trade shock (2000 to 2007, 2010, 2012, 2014)

- Post-2000 continuing adjustment to the 1991-2000 trade shock
- Analysis of pre-trends in outcome variables
- Adjusting standard errors in shift-share analysis
- Gravity-based spillovers of trade shocks between regions

Large, enduring declines in MFG and wage & salary employment



Note: Each point indicates the estimated trade-shock coefficient from a separate regression in which the time difference for the outcome variable is 2001 to the year indicated on the horizontal axis.

Actual vs. Projected Change in Employment Rate, 2000-2019



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Impacts on MFG, Non-MFG and Total Employment (ACS)

Large, enduring declines in manufacturing and total employment



Precise negative impacts only for those ages 25 to 39

(a) Log population ages 40-64

(b) Log population ages 25-39

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Note: Each point indicates the estimated trade-shock coefficient from a separate regression in which the time difference for the outcome variable is 2000 to the year indicated on the horizontal axis.

Impacts on Population by Education and Nativity (ACS)

Precise impacts only for foreign-born without a college degree



Negative impacts on personal income per capita out to 2019, small increases in transfers (primarily Social Security, Medicare)



Note: Each point indicates the estimated trade-shock coefficient from a separate regression in which the time difference for the outcome variable is 2000 to the year indicated on the horizontal axis.

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Increase in transfers is due entirely to Social Security, Medicare

(a) SSA, SSDI, Medicare per capita

(b) Income assistance per capita

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Potential Hypotheses

1 The shock never really ended, it just relocated to Vietnam

- Unsupported: Evidence indicates shock plateaued after 2010
- 2 Labor regulations impeded moving workers into new lines of activity
 - Unlikely: Most impacted CZs were in right-to-work states (Chan)
- S A dearth of human capital kept CZs from attracting new industries
 - Split CZs according to supply of college workers (Bloom et al.)
- Ø Specialization in footloose industries left CZs exposed to shocks
 - Split CZs according to industry specialization (Eriksson et al.)

Explaining the Enduring Impact of the Shock

-		Values in 2000		Trade		
Commuting Zone	Population (000s)	Manuf. share of employment (%)	BA degree share of pop. 18-64 (%)	Change in import penetration (ppt), 2000-2012		
Sioux City, IA-NE-SD	187.6	27.0	18.8	6.10		
Inion County, MS	54.4	50.1	15.2	5.41		
Meridian, MS	156.9	26.5	13.3	5.09		
Hutchinson, MN	73.0	41.5	16.2	4.43		
North Hickory, NC	377.5	43.0	15.6	4.40		
'upelo, MS	198.1	43.7	14.4	4.18		
Martinsville, VA	19.4	47.4	11.6	3.94		
Carroll County, VA	27.5	45.1	10.4	3.80		
Lynchburg, VA	112.4	26.9	18.5	3.74		
West Hickory, NC	165.1	49.9	12.9	3.70		
Ienderson County, TN	44.9	45.9	9.7	3.58		
crossville, TN	104.5	35.6	11.5	3.45		
Raleigh-Cary, NC	1420.0	17.0	34.2	3.42		
leveland, TN	203.7	39.9	12.4	3.20		
McMinnville, TN	84.5	48.9	10.4	3.19		
Faribault-Northfield, MN	110.1	32.9	20.2	3.16		
St. Marys, PA	41.0	54.7	13.2	3.13		
Danville, KY	86.7	38.3	16.6	3.01		
Quincy, IL-MO	152.3	23.8	16.1	2.97		
Greene County, GA	35.5	41.1	13.4	2.84		
Fort Wayne, IN	558.4	29.2	18.4	2.83		
Huntsville, AL	521.4	25.5	24.6	2.75		

Explaining the Enduring Impact of the Shock

Dearth of human-capital hypothesis: Negative impacts are concentrated in regions that began as less college-educated

(a) Wage & salary emp./Wkg-age pop.

(b) Log working-age pop.

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Note: Each point indicates the estimated trade-shock coefficient from a separate regression in which the time difference for the outcome variable is 2001 to the year indicated on the horizontal axis.

Explaining the Enduring Impact of the Shock

Reverse-agglomeration hypothesis: Negative impacts are stronger in regions that began as more industrially specialized

(a) Wage & salary emp./Wkg-age pop.

(b) Log working-age pop.



Note: Each point indicates the estimated trade-shock coefficient from a separate regression in which the time difference for the outcome variable is 2001 to the year indicated on the horizontal axis.

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Adjustment to Bartik shock for change in coal employment, 1980-2000 (qualitatively but not quantitatively similar to the China trade shock)

(a) Wage & salary emp./Wkg-age pop.

(b) Log working-age pop.

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Note: Each point indicates the estimated trade-shock coefficient from a separate regression in which the time difference for the outcome variable is 2001 to the year indicated on the horizontal axis.

Adjustment to the Great Recession

Adjustment to Bartik shock for the Great Recession, 2006-2009

(a) Wage & salary emp./Wkg-age pop.

(b) Log working-age pop.

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Variance in Trade-Shock-Induced \triangle Income per Capita

Deviation from national mean in impact of trade shock on average personal income (GE models of China trade shock imply aggregate change in welfare of just 0.25%)



Note: Unweighted std. dev. of shock impact is: 1.22 percentage points (N = 722, 36 bins).



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Final Discussion

What made scarring effects of the China shock so pronounced?

- Scale of the shock, concentration of the shock in space and time (eg, relative to more spatially diffuse impacts of automation)
- Concentration of shock on specialized regions without skilled labor (which may portend impacts of ongoing energy transformation)
- Intensifying barriers to labor mobility: housing, family, age/skill (which may be compounded by barriers to capital mobility)

Selected Literature on the China Trade Shock

- Regional employment, earnings, migration, public finance
 - ADH '13, '15, '19; Chetverikov et al '16; Greenland et al '16, '19; Feler Senses '17; Monte et al '18; Bloom et al '20; Pierce Schott '20
 - Coal, oil, steel: Black et al '02 '03 '05, Michaels '10, Jacobsen-Parker '14, Feyrer et al '17, Allcott-Kenniston '18, Bartik et al '19
- Industries, innovation, product prices
 - Bernard et al '06; ADHS '14; Bloom et al '15; AADHP '16; Pierce Schott '16; Amiti et al '17; Handley Limão '17; Asquith et al '19; ADHPS '19; Erickson et al '19; Feenstra et al '19; Jaravel Sager '20
- Quantitative GE analysis
 - Hsieh Ossa '16; Caliendo et al '19; Adão et al '20; Galle et al '20; Kim Vogel '20; Rodriguez-Clare et al '20
- Political economy
 - Fiegenbaum Hall '15; Colantone Stanig '18a,b; Grossman Helpman '18; Gennaioli Tabellini '19; ADHM '20; Chen et al '20; Rodrik '20
- Identification and inference
 - Adão et al '19; Borusyak et al '20; Goldsmith-Pinkham et al '20

Additional Discussion

- It's technology, not trade, that causes mfg job loss
 - Conditional regional correlation of trade, tech. shocks is small
- The decline in mfg employment would have happened anyway
 - Scale, speed, localization of job loss determines scarring effects
- There's nothing special about job loss due to trade
 - True, but trade shocks can be highly concentrated in space and time

- Reduced-form empirical analysis isn't informative about welfare
 - RF analysis is informative about distributional impacts