The China Shock

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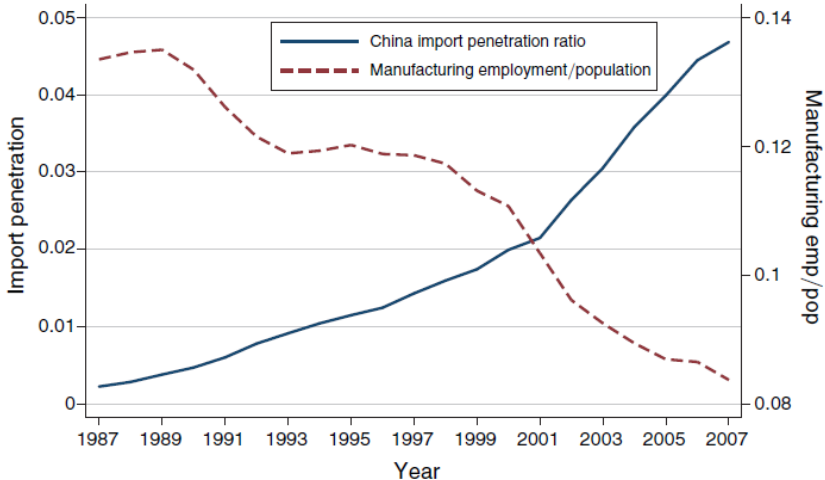
Introduction

- The share of total US spending on Chinese goods rose from 0.6 percent in 1991 to 4.6 percent in 2007.
- Over the same period, the fraction of US working-age population employed in manufacturing fell by a third, from 12.6 percent to 8.4 percent.
- Did the rise in imports from China decrease the US manufacturing employment?


China import penetration ratio
Manufacturing employment/population
Import penetration
Manufacturing emp/pop
0.05
0.04
0.03
0.02
0.01
0
0.14
0.12
0.1
0.08
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
Year

Data

- The UN Comtrade: Trade data (trade values from China to US and other countries)
- The Census Integrated Public Use Micro Samples and the American Community Survey (ACS): commuting zones' populations and employment and wages across sectors.
- These datasets are freely available. For the US census and ACS, register for IPUMS.
- Crosswalks across different sector classifications and crosswalks across different geographic units are available at David Dorn's webpage.

Shift-shares (1)

- The change in Chinese import exposure in a region is

$$\Delta IPW_{uit} = \sum_j \frac{L_{ijt}}{L_{ujt}} \frac{\Delta M_{ucjt}}{L_{it}}. \quad (1)$$

  - L_{ijt}: the start of period (year t) employment of industry j in region (commuting zone) i,
  - L_{ujt}: the start of period employment of industry j in the US,
  - ΔM_{ucjt}: the observed change in US imports from China in industry j between the start and end of the period,
  - L_{it}: the the start of period employment in region i.

Shift share (2)

- Instrument (1) by contemporaneous industry-level growth of Chinese exports to other high-income markets and lagged industry-level employment

$$\Delta IPW_{oit} = \sum_j \frac{L_{ijt-1}}{L_{ujt-1}} \frac{\Delta M_{ocjt}}{L_{it-1}}.$$

- This expression for non-US exposure to Chinese imports differs from the expression in equation (1) in two respects.
  1. In place of realized US imports by industry (ΔM_{ucjt}), it uses realized imports from China to other high-income markets (ΔM_{ocjt}).
  2. In place of start-of-period employment levels by industry and region, this expression uses employment levels from the *prior* decade.

Main specification (of the two-step least squares)

- Using the full sample of 722 CZs and weighting each observation by start of period CZ population, we fit models of the following form:

$$\Delta L_{it}^{m} = \gamma_t + \beta_1 \Delta IPW_{uit} + \mathbf{X}_{it}' \beta_2 + e_{it}.$$

  - ΔL_{it}^{m}: the decadal change in the manufacturing employment share of the working-age population in commuting zone i.
- For the long interval between 1990 and 2007, we stack the first differences for the two periods, 1990 to 2000 and 2000 to 2007, and include separate time dummies for each decade (in γ_t).
- The change in import exposure ΔIPW_{uit} is instrumented by the variable ΔIPW_{oit} as described above.

TABLE 2—IMPORTS FROM CHINA AND CHANGE OF MANUFACTURING EMPLOYMENT IN CZs, 1970–2007: 2SLS ESTIMATES

Dependent variable: 10 × annual change in manufacturing emp/working-age pop (in % pts)

	I. 1990–2007			II. 1970–1990 (pre-exposure)		
	1990–2000 (1)	2000–2007 (2)	1990–2007 (3)	1970–1980 (4)	1980–1990 (5)	1970–1990 (6)
(Δ current period imports from China to US)/worker	−0.89*** (0.18)	−0.72*** (0.06)	−0.75*** (0.07)			
(Δ future period imports from China to US)/worker				0.43*** (0.15)	−0.13 (0.13)	0.15 (0.09)

Notes: $N = 722$, except $N = 1{,}444$ in stacked first difference models of columns 3 and 6. The variable "future period imports" is defined as the average of the growth of a CZ's import exposure during the periods 1990–2000 and 2000–2007. All regressions include a constant and the models in columns 3 and 6 include a time dummy. Robust standard errors in parentheses are clustered on state. Models are weighted by start of period CZ share of national population.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

Summary

- To explore the effect of increasing Chinese import penetration on manufacturing employment, we run a shift-share regression.
- The shift share is the sector-level growth in Chinese imports (shift) interacted with the initial level of sectoral employment shares across CZs (share).
- The China shock did decrease manufacturing employment across CZs.