The China Syndrome

Local Labor Market Effects of Import Competition in the United States

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Introduction

Research question

- Study the effect of Chinese import competition between 1990 and 2007 on U.S. local labor markets
  - Treat local labor markets as sub-economies subject to differential trade shocks according to initial patters of industry specialization

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  - Treat local labor markets as sub-economies subject to differential trade shocks according to initial patters of industry specialization
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  - Employment, unemployment, participation, wages, income, mobility, and transfers
- Develop robust instrument variable approach

Introduction

Stylized facts

- Pre-1990s limited impact trade on U.S. labor
- Trend decline in U.S. manufacturing employment
- Increase in import competition from China without an offsetting increase in demand for U.S. exports
- Variation in regional manufacturing employment in U.S. and within-manufacturing import

Introduction

Stylized facts

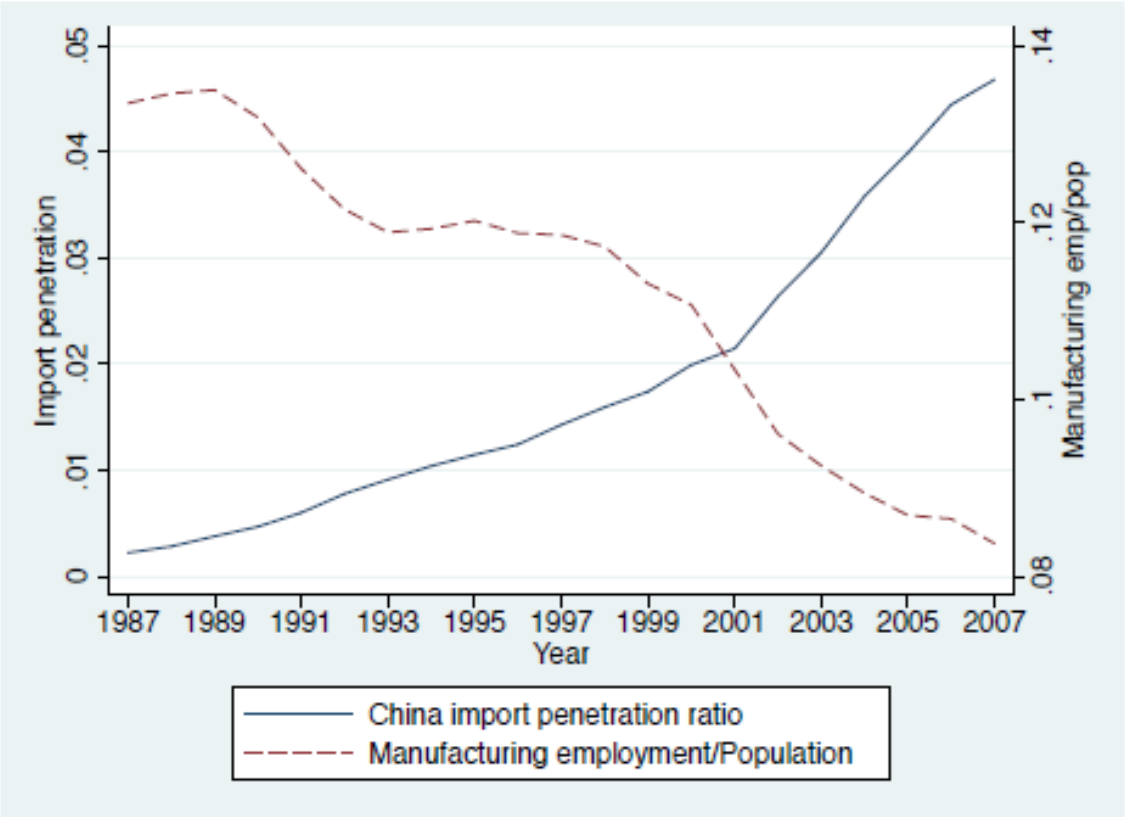

Figure 1.
Import Penetration Ratio for U.S. Imports from China (left scale), and Share of U.S. Working-Age Population Employed in Manufacturing (right scale).

Figure 1: China's import penetration and U.S. manufacturing employment

Theoretical predictions

- China experienced
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  - Reduction in its trade costs: accession to WTO

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  - Productivity growth: transition from central planning to a market economy
  - Reduction in its trade costs: accession to WTO
- Effect to labor market of U.S. region i?
  - Increased competition in markets in which region i sells its output
  - Increased demand for goods in China

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  - Decrease region i's wage and employment in traded goods
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- Final effect depend on trade imbalance
- Focus on import competition in U.S.
  - U.S. imports from China vastly exceed U.S. exports to China
  - U.S. market accounts for large majority of demand for most U.S. industries

Local labor market exposure to import competition

- $\Delta IPW_{uit} = \sum_j \frac{L_{ijt}}{L_{ujt}} \frac{\Delta M_{ucjt}}{L_{it}}$

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- Bias
  - Realized U.S. imports from China correlated with unobserved shocks to U.S. product demand and U.S. employment
  - Need instrument for growth in Chinese imports in U.S. (ΔIPW)

Identification strategy

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  - Chinese imports in eight other developed countries

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- However, evidence that China's export growth strongly related to factor specific to China

Benchmark estimation

- Data sources (from 1991 to 2007): UN Comtrade, U.S. Census, American Community Survey, Bureau of Economic Analysis, Social Security Administration

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- Demographic and labor force controls
  - Share of manufacturing in a CZ's start-of-period employment
  - Region dummy
  - Start-of-period share of population with college education, foreign born and working age women
  - Susceptibility of a CZ's occupations to substitution by technology or task offshoring

Benchmark estimation

Results with no controls

Table 2. Imports from China and Change of Manufacturing Employment in Commuting Zones, 1970-2007
2SLS Estimates.
Dependent Variable: 10 x Annual Change in Manufacturing Emp/Working Age Pop (in %pts)

	I. 1990-2007			II. 1970-1990 (Pre-Exposure)		
	1990-2000	2000-2007	1990-2007	1970-1980	1980-1990	1970-1990
	(1)	(2)	(3)	(4)	(5)	(6)
(Δ Current Period Imports from China to US)/Worker	-0.89 **	-0.72 **	-0.75 **			
	(0.18)	(0.06)	(0.07)			
(Δ Future Period Imports from China to US)/Worker				0.43 **	-0.13	0.15
				(0.15)	(0.13)	(0.09)

Negative effect import exposure on manufacturing employment in CZ

Benchmark estimation

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No evidence reverse causality

Benchmark estimation

Augmented regression

Table 3. Imports from China and Change of Manufacturing Employment in Commuting Zones, 1990-2007: 2SLS Estimates.

Dependent Var: 10 x Annual Change in Manufacturing Emp/Working Age Pop (in %pts)

	I. 1990-2007 Stacked First Differences					
	(1)	(2)	(3)	(4)	(5)	(6)
(Δ Imports from China to US)/Worker	-0.746 **	-0.610 **	-0.538 **	-0.508 **	-0.562 **	-0.596 **
	(0.068)	(0.094)	(0.091)	(0.081)	(0.096)	(0.099)
Percentage of employment in manufacturing$_{-1}$		-0.035	-0.052 **	-0.061 **	-0.056 **	-0.040 **
		(0.022)	(0.020)	(0.017)	(0.016)	(0.013)
Percentage of college-educated population$_{-1}$				-0.008		0.013
				(0.016)		(0.012)
Percentage of foreign-born population$_{-1}$				-0.007		0.030 **
				(0.008)		(0.011)
Percentage of employment among women$_{-1}$				-0.054 *		-0.006
				(0.025)		(0.024)
Percentage of employment in routine occupations$_{-1}$					-0.230 **	-0.245 **
					(0.063)	(0.064)
Average offshorability index of occupations$_{-1}$					0.244	-0.059
					(0.252)	(0.237)
Census division dummies	No	No	Yes	Yes	Yes	Yes

Robust effect import exposure

Benchmark estimation

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Larger decline in manufacturing employment in CZs with greater initial manufacturing employment share

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with smaller initial foreign born

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Census division dummies	No	No	Yes	Yes	Yes	Yes

with higher employment in routine-task occupations

Labor Market effects estimation

Reallocation of worker

Table 4. Imports from China and Change of Working Age Population in Commuting Zones, 1990-2007: 2SLS Estimates

Dependent Variables: 10-Year Equivalent Changes in Log Population Counts (in log pts)

	I. By Education Level			II. By Age Group		
	All	College	Non-College	Age 16-34	Age 35-49	Age 50-64
	(1)	(2)	(3)	(4)	(5)	(6)
A. No Census Division Dummies or Other Controls						
(Δ Imports from China to US)/Worker	-1.031 *	-0.360	-1.097 *	-1.299	-0.615	-1.127 **
	(0.503)	(0.660)	(0.488)	(0.826)	(0.572)	(0.422)
R^2	.	0.03	0.00	0.17	0.59	0.22
B. Controlling for Census Division Dummies						
(Δ Imports from China to US)/Worker	-0.355	0.147	-0.240	-0.408	-0.045	-0.549
	(0.513)	(0.619)	(0.519)	(0.953)	(0.474)	(0.450)
R^2	0.36	0.29	0.45	0.42	0.68	0.46
C. Full Controls						
(Δ Imports from China to US)/Worker	-0.050	-0.026	-0.047	-0.138	0.367	-0.138
	(0.746)	(0.685)	(0.823)	(1.190)	(0.560)	(0.651)
R^2	0.42	0.35	0.52	0.44	0.75	0.60

No evidence that shocks to local manufacturing lead to change in population

Labor Market effects estimation

Reallocation of worker

- If mobility response is large, unlikely to find indirect effects of trade on local labor markets

Labor Market effects estimation

Reallocation of worker

- If mobility response is large, unlikely to find indirect effects of trade on local labor markets
- No robust evidence that shocks to local manufacturing lead to substantial change in population
  - Shocks to manufacturing from China too small to affect outcomes in broader CZ
  - Good markets very well integrated nationally, local labor markets adjust without a mobility response
  - Cost of moving geographically and between sectors, transfers and house price bear part of the incidence of labor demand shocks

Labor Market effects estimation

Labor force

Table 5. Imports from China and Employment Status of Working Age Population within Commuting Zones, 1990-2007: 2SLS Estimates.
Dep Vars: 10-Year Equivalent Changes in Log Population Counts and Population Shares by Employment Status

	Mfg Emp (1)		Non-Mfg Emp (2)		Unemp (3)		NILF (4)		SSDI Receipt (5)	
A. 100 × Log Change in Population Counts										
(Δ Imports from China to US)/Worker	-4.231	**	-0.274		4.921	**	2.058	~	1.466	**
	(1.047)		(0.651)		(1.128)		(1.080)		(0.557)	
B. Change in Population Shares										
All Education Levels										
(Δ Imports from China to US)/Worker	-0.596	**	-0.178		0.221	**	0.553	**	0.076	**
	(0.099)		(0.137)		(0.058)		(0.150)		(0.028)	
College Education										
(Δ Imports from China to US)/Worker	-0.592	**	0.168		0.119	**	0.304	**	.	
	(0.125)		(0.122)		(0.039)		(0.113)			
No College Education										
(Δ Imports from China to US)/Worker	-0.581	**	-0.531	**	0.282	**	0.831	**	.	
	(0.095)		(0.203)		(0.085)		(0.211)			

Reduction in manufacturing employment no offset by a rise non-manufacturing employment

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Rise in unemployment and labor force non-participants

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More pronounced effects for no college adults

Labor Market effects estimation

Labor force

1000$ per worker increase in CZ's import exposure reduces employment to population ratio by 0.77 percent

- 3/4 because of loss in manufacturing and 1/4 because of non-manufacturing
- 1/4 reduction in employment because of rise in unemployment and 3/4 because of higher non-participation

Labor Market effects estimation

Wages

Table 7. Comparing Employment and Wage Changes in Manufacturing and outside Manufacturing, 1990-2007: 2SLS Estimates.
Dep Vars: 10-Year Equiv. Changes in Log Workers (in Log Pts) and Avg Log Weekly Wages (in %)

	I. Manufacturing Sector			II. Non-Manufacturing					
	All Workers	College	Non-College	All Workers		College		Non-College	
	(1)	(2)	(3)	(4)		(5)		(6)	
(Δ Imports from China to US)/Worker	0.150	0.458	-0.101	-0.761	**	-0.743	*	-0.822	**
	(0.482)	(0.340)	(0.369)	(0.260)		(0.297)		(0.246)	
R^2	0.22	0.21	0.33	0.60		0.54		0.51	

General negative effect import exposure on average weekly earnings but no significant effects on manufacturing wages

Labor Market effects estimation

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R^2	0.22	0.21	0.33	0.60	0.54	0.51

Decrease wages in non-manufacturing sectors

Labor Market effects estimation

Wages

- Partial and incomplete labor market adjustments
  - Labor and product markets are not sufficiently integrated
  - Manufacturing wages are downwardly rigid
  - Non-manufacturing subject to negative demand shocks and positive labor supply shocks
  - GE effect within but not across local labor markets labor markets
- Substantial increase in transfer payments: disability, medical, income assistance, unemployment benefits

Robustness checks

Results are robust to

- Different measures of trade exposure
  - Include competition in foreign markets
  - Consider that imports from China include both final goods purchased by U.S. consumers and intermediate inputs purchased by U.S. firms
  - Consider net import from China
  - Apply gravity residual: replace growth in U.S. imports from China with inferred change in China's comparative advantage
  - Use factor content of U.S. net imports from China (change in net import of effective labor services)
- Drop of housing and construction sectors, computer industry and consumer good industries
- Adding other low-income countries

Conclusions

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- Chinese import competition explains 21 percent of decline manufacturing employment in U.S. from 1991 to 2007 (982 thousand workers)
- Partial and incomplete labor market adjustments
- Estimated deadweight loss due to involuntary employment is between 87 $ and 137 $ per capita