

Author: David H. Autor; David Dorn; Gordon H. Hanson

Reported by: MENG Ke

The China Syndrome

local labor market effects of import competition in the United States

Author: David H. Autor; David Dorn; Gordon H. Hanson

Reported by: MENG Ke

China Institute for WTO Studies, UIBE

September 13, 2022

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

The China Syndrome

Author: David H.
Autor; David Dorn;
Gordon H. Hanson

Reported by: MENG
Ke

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

The China Syndrome

Author: David H.
Autor; David Dorn;
Gordon H. Hanson

Reported by: MENG
Ke

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources
& measurement

Empirical approach

IV Strategy

Result

Beyond
manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

Conclusion

Main conclusions of this paper:

conclusion

- ▶ The EXPOSURE to Chinese import competition affects US local labor markets
- ▶ The rising EXPOSURE increase unemployment, lowers labor force participation and reduces wages in local labor market.
- ▶ This effect explains 1/4 of the contemporaneous aggregate decline in U.S. manufacturing employment.

Background

- ▶ After China's accession to the WTO, its economic growth has been impressive, China's exports to the world increase at a skyrocketed way.
- ▶ Unequal wages in the U.S. labor market, rising unemployment in manufacturing.
- ▶ The share of total U.S. spending on Chinese goods rose from 0.6% in 1991 to 4.6% in 2007.

The China Syndrome

Author: David H. Autor; David Dorn; Gordon H. Hanson

Reported by: MENG Ke

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

Background

The China Syndrome

Author: David H. Autor; David Dorn; Gordon H. Hanson

Reported by: MENG Ke

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources
& measurement

Empirical approach

IV Strategy

Result

Beyond
manufacturing
population effect
employment effect
Wage effect
Public transfer payment
Household income
Robustness check

Conclusion

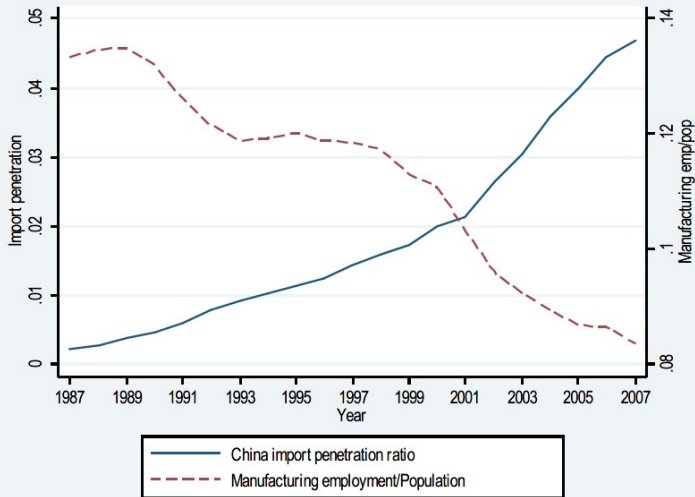


Figure 1.

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

Table 1. Value of Trade with China for the U.S. and Other Selected High-Income Countries and Value of Imports from all other Source Countries, 1991/1992-2007.

	I. Trade with China (in BN 2007 US\$)		II. Imports from Other Countries (in BN 2007 US\$)		
	Imports from China (1)	Exports to China (2)	Imports from Other Low-Inc. (3)	Imports from Mexico/Cafta (4)	Imports from Rest of World (5)
<u>A. United States</u>					
1991/92	26.3	10.3	7.7	38.5	905.8
2000	121.6	23.0	22.8	151.6	1865.5
2007	330.0	57.4	45.4	183.0	2365.9
Growth 1991-07	1156%	456%	491%	375%	161%
<u>B. 8 Other Developed Countries</u>					
1991/92	28.2	26.6	9.2	2.8	1708.8
2000	94.3	68.2	13.7	5.3	1979.8
2007	262.8	196.9	31.0	11.6	3339.3
Growth 1991-07	832%	639%	236%	316%	95%

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

QUESTION: What is EXPOSURE?

Shift-share: Consider regional economic changes as a dynamic process

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

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

i:region j:industry t:time
M:import from China L:employment

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources
& measurement

Empirical approach

IV Strategy

Result

Beyond
manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

The China Syndrome

Author: David H.
Autor; David Dorn;
Gordon H. Hanson

Reported by: MENG
Ke

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources
& measurement

Empirical approach

IV Strategy

Result

Beyond
manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

Data

- ▶ Export: from UN comtrade (HS6 digit)
- ▶ Employment: Employment data for 397 manufacturing industries comes from County Business Patterns data
- ▶ US regional(i): Commuting Zones (CZs)

The China Syndrome

Author: David H. Autor; David Dorn; Gordon H. Hanson

Reported by: MENG Ke

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

Table 1. Value of Trade with China for the U.S. and Other Selected High-Income Countries and Value of Imports from all other Source Countries, 1991/1992-2007.

	I. Trade with China (in BN 2007 US\$)		II. Imports from Other Countries (in BN 2007 US\$)		
	Imports from China	Exports to China	Imports from Other Low-Inc.	Imports from Mexico/Cafta	Imports from Rest of World
	(1)	(2)	(3)	(4)	(5)
<u>A. United States</u>					
1991/92	26.3	10.3	7.7	38.5	905.8
2000	121.6	23.0	22.8	151.6	1865.5
2007	330.0	57.4	45.4	183.0	2365.9
Growth 1991-07	1156%	456%	491%	375%	161%
<u>B. 8 Other Developed Countries</u>					
1991/92	28.2	26.6	9.2	2.8	1708.8
2000	94.3	68.2	13.7	5.3	1979.8
2007	262.8	196.9	31.0	11.6	3339.3
Growth 1991-07	832%	639%	236%	316%	95%

Data

- ▶ Export: from UN comtrade (HS6 digit)
- ▶ Employment: Employment data for 397 manufacturing industries comes from County Business Patterns data
- ▶ US regional(i): Commuting Zones (CZs)

The China Syndrome

Author: David H. Autor; David Dorn; Gordon H. Hanson

Reported by: MENG Ke

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

X:exposure

The China Syndrome

Author: David H.
Autor; David Dorn;
Gordon H. Hanson

Reported by: MENG
Ke

Background

A Shift-Share Method

Data Sources & measurement

IV Strategy

Result

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Appendix Table 1. Descriptive Statistics for Growth of Imports Exposure per Worker across CZones

I. 1990-2000		II. 2000-2007	
A. Percentiles			
90th percentile	2.05	90th percentile	4.30
75th percentile	1.32	75th percentile	3.11
50th percentile	0.89	50th percentile	2.11
25th percentile	0.62	25th percentile	1.60
10th percentile	0.38	10th percentile	1.03

X:exposure

Rank	B. Largest and Smallest Values among the 40 Largest C'Zones			
1	San Jose, CA	3.15	San Jose, CA	7.32
2	Providence, RI	2.59	Providence, RI	4.99
3	Buffalo, NY	2.24	Los Angeles, CA	3.59
4	Boston, MA	1.55	San Diego, CA	3.08
5	Portland, OR	1.53	Portland, OR	2.96
6	San Diego, CA	1.52	Pittsburgh, PA	2.95
7	Newark, NJ	1.32	Chicago, IL	2.93
8	Los Angeles, CA	1.28	Milwaukee, WI	2.93
9	Bridgeport, CT	1.27	Boston, MA	2.79
10	Denver, CO	1.23	Dallas, TX	2.77
20	Forth Worth, TX	0.83	Columbus, OH	1.90
21	Phoenix, AZ	0.83	Phoenix, AZ	1.90
31	Atlanta, GA	0.61	Fresno, CA	1.56
32	Pittsburgh, PA	0.56	St. Louis, MO	1.53
33	Sacramento, CA	0.53	Tampa, FL	1.49
34	Kansas City, MO	0.51	Atlanta, GA	1.31
35	West Palm Beach, FL	0.48	Baltimore, MD	1.25
36	Fresno, CA	0.47	West Palm Beach, FL	1.22
37	Orlando, FL	0.46	Kansas City, MO	1.13
38	Houston, TX	0.45	Washington, DC	0.86
39	Washington, DC	0.21	New Orleans, LA	0.70
40	New Orleans, LA	0.19	Orlando, FL	0.59

The China Syndrome

Author: David H. Autor; David Dorn; Gordon H. Hanson

Reported by:MENG Ke

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

Author: David H.
Autor; David Dorn;
Gordon H. Hanson

Reported by: MENG
Ke

Background

A Shift-Share Method

Data Sources & measurement

IV Strategy

Result

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Appendix Table 2. Means and Standard Deviations of Commuting Zone Variables.

	I. Levels			II. 10-Year Equivalent Chg	
	1990/1991	2000	2007	1990-2000	2000-2007
	(1)	(2)	(3)	(4)	(5)
(Imports from China to US)/(Workers in 1990) (in kUS\$)	0.29 (0.32)	1.32 (1.18)	3.58 (2.84)	1.14 (0.99)	n/a
(Imports from China to US)/(Workers in 2000) (in kUS\$)	0.25 (0.27)	1.08 (0.90)	2.92 (2.13)	n/a	2.63 (2.01)
Percentage of working age pop employed in manufacturing	12.69 (4.80)	10.51 (4.45)	8.51 (3.60)	-2.07 (1.63)	-2.73 (1.80)
Percentage of working age pop employed in non-manufacturing	57.75 (5.91)	59.16 (5.24)	61.87 (4.95)	1.29 (2.38)	3.70 (2.71)
Percentage of working age pop unemployed	4.80 (0.99)	4.28 (0.93)	4.87 (0.90)	-0.51 (0.73)	0.85 (1.39)
Percentage of working age pop not in the labor force	24.76 (4.34)	26.05 (4.39)	24.75 (3.70)	1.29 (2.56)	-1.82 (2.57)
Percentage of working age pop receiving disability benefits	1.86 (0.63)	2.75 (1.04)	3.57 (1.41)	0.91 (6.38)	1.23 (0.71)
Average log weekly wage, manufacturing sector (in log pts)	655 (17)	666 (17)	671 (19)	11.4 (6.4)	7.8 (7.7)
Average log weekly wage, non-manufacturing sectors (in log pts)	637 (16)	650 (15)	653 (16)	12.5 (4.1)	3.5 (4.3)

Author: David H.
Autor; David Dorn;
Gordon H. Hanson

Reported by: MENG
Ke

Appendix Table 2. Means and Standard Deviations of Commuting Zone Variables.

	I. Levels			II. 10-Year Equivalent Chg	
	1990/1991	2000	2007	1990-2000	2000-2007
	(1)	(2)	(3)	(4)	(5)
Average individual transfers per capita (in US\$)	3338 (692)	4297 (908)	5544 (1091)	1004.4 (334.0)	1844.0 (437.6)
Average retirement benefits per capita (in US\$)	1121 (284)	1262 (310)	1398 (338)	150.5 (79.3)	206.2 (120.4)
Average disability benefits per capita (in US\$)	136 (46)	213 (77)	300 (112)	78.2 (39.8)	128.3 (61.5)
Average medical benefits per capita (in US\$)	1115 (371)	1789 (552)	2564 (679)	698.3 (231.9)	1142.8 (288.5)
Average federal income assistance per capita (in US\$)	298 (136)	270 (134)	303 (129)	-24.8 (43.6)	52.2 (46.0)
Average unemployment benefits per capita (in US\$)	106 (52)	86 (43)	108 (55)	-19.1 (29.4)	34.1 (41.0)
Average TAA benefits per capita (in US\$)	0.6 (0.6)	1.1 (1.0)	2.2 (2.7)	0.5 (0.9)	1.6 (3.3)
Avg household income per working age adult (in US\$)	32122 (6544)	38126 (7743)	37909 (7501)	5964 (2358)	-367 (2646)
Avg household wage and salary income per w. age adult (in US\$)	23496 (4700)	27655 (5449)	28872 (6304)	4152 (1569)	1703 (2623)

Background

A Shift-Share Method

Data Sources & measurement

IV Strategy

Result

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

The China Syndrome

Author: David H.
Autor; David Dorn;
Gordon H. Hanson

Reported by: MENG
Ke

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

instrumental variable strategy

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

$$\Delta IPW_{oit} = \sum_j \frac{L_{ijt-1}}{L_{ujt-1}} \frac{\Delta M_{ocjt}}{L_{it-1}} \quad (2)$$

- ▶ Endogeneity: U.S. imports from China in (1) may be correlated with industry labor demand shocks.
- ▶ employ an instrumental variables using the exogenous component of Chinese imports.
- ▶ using data on contemporaneous industry-level growth of Chinese exports to other high-income markets; Build exposure as shown in (2)

The China Syndrome

Author: David H. Autor; David Dorn; Gordon H. Hanson

Reported by: MENG Ke

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources
& measurement

Empirical approach

IV Strategy

Result

Beyond
manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

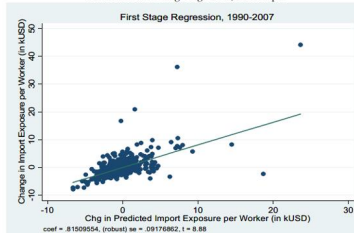
Robustness check

Conclusion

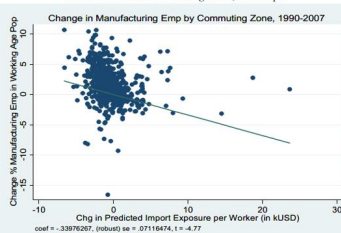
instrumental variable strategy

$$\Delta L_{it}^m = \gamma_t + \beta_1 \Delta IPW_{uit} + X_{it}' \beta_2 + e_{ct}$$

Panel A: 2SLS 1st Stage Regression, Full Sample



Panel B: OLS Reduced Form Regression, Full Sample



The China Syndrome

Author: David H. Autor; David Dorn; Gordon H. Hanson

Reported by: MENG Ke

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources
& measurement

Empirical approach

IV Strategy

Result

Beyond
manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

Result

$$\Delta L_{it}^m = \gamma_t + \beta_1 \Delta IPW_{uit} + X_{it}' \beta_2 + e_{ct}$$

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 ** (0.18)	-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=1444 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 commuting zone share of national population. ~ p ≤ 0.10, * p ≤ 0.05, ** p ≤ 0.01.

Result

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 ** (0.068)	-0.610 ** (0.094)	-0.538 ** (0.091)	-0.508 ** (0.081)	-0.562 ** (0.096)	-0.596 ** (0.099)
Percentage of employment in manufacturing _i		-0.035 (0.022)	-0.052 ** (0.020)	-0.061 ** (0.017)	-0.056 ** (0.016)	-0.040 ** (0.013)
Percentage of college-educated population _i				-0.008 (0.016)		0.013 (0.012)
Percentage of foreign-born population _i				-0.007 (0.008)		0.030 ** (0.011)
Percentage of employment among women _i				-0.054 * (0.025)		-0.006 (0.024)
Percentage of employment in routine occupations _i					-0.230 ** (0.063)	-0.245 ** (0.064)
Average offshorability index of occupations _i					0.244 (0.252)	-0.059 (0.237)
Census division dummies	No	No	Yes	Yes	Yes	Yes
II. 2SLS First Stage Estimates						
(Δ Imports from China to OTH)/Worker	0.792 ** (0.079)	0.664 ** (0.086)	0.652 ** (0.090)	0.635 ** (0.090)	0.638 ** (0.087)	0.631 ** (0.087)
R ²	0.54	0.57	0.58	0.58	0.58	0.58

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

The China Syndrome

Author: David H.
Autor; David Dorn;
Gordon H. Hanson

Reported by: MENG
Ke

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

population effect

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

Dependent Variables: 10-Year Equivalent Log Changes in Headcounts (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 (0.503)	* -0.360 (0.660)	-1.097 (0.488)	* -1.299 (0.826)	-0.615 (0.572)	-1.127 (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 (0.513)	0.147 (0.619)	-0.240 (0.519)	-0.408 (0.953)	-0.045 (0.474)	-0.549 (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 (0.746)	-0.026 (0.685)	-0.047 (0.823)	-0.138 (1.190)	0.367 (0.560)	-0.138 (0.651)
R ²	0.42	0.35	0.52	0.44	0.75	0.60

Notes: N=1444 (722 commuting zones x 2 time periods). All regression include a constant and a dummy for the 2000-2007 period. Models in Panel B and C also include Census Division dummies while Panel C adds the full vector of control variables from column 6 of Table 3. Robust standard errors in parentheses are clustered on state. Models are weighted by start of period commuting zone share of national population. ~ p ≤ 0.10, * p ≤ 0.05, ** p ≤ 0.01.

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

employment effect

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 Population Log Population Counts and Population Shares by
Employment Status

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

Notes: N=1444 (722 commuting zones x 2 time periods). All statistics are based on working age individuals (age 16 to 64).

The effect of import exposure on the overall employment/population ratio can be computed as the sum of the coefficients for manufacturing and non-manufacturing employment; this effect is highly statistically significant ($p \leq 0.01$) in the full sample and in all reported subsamples. All regressions include the full vector of control variables from column 6 of Table 3.

Robust standard errors in parentheses are clustered on state. Models are weighted by start of period commuting zone share of national population. ~ $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$.

Author: David H.
Autor; David Dorn;
Gordon H. Hanson

Reported by: MENG
Ke

Background

A Shift-Share Method

IV Strategy

Result

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Wage effect

Table 6. Imports from China and Wage Changes within Commuting Zones, 1990-2007: 2SLS Estimates.

Dep Var: 10-Year Equivalent Change in Avg Log Weekly Wage (in log pts)

	All Workers (1)		Males (2)		Females (3)	
<u>A. All Education Levels</u>						
(Δ Imports from China to US)/Worker	-0.759 (0.253)	**	-0.892 (0.294)	**	-0.614 (0.237)	**
R ²	0.56		0.44		0.69	
<u>B. College Education</u>						
(Δ Imports from China to US)/Worker	-0.757 (0.308)	*	-0.991 (0.374)	**	-0.525 (0.279)	~
R ²	0.52		0.39		0.63	
<u>C. No College Education</u>						
(Δ Imports from China to US)/Worker	-0.814 (0.236)	**	-0.703 (0.250)	**	-1.116 (0.278)	**
R ²	0.52		0.45		0.59	

Notes: N=1444 (722 commuting zones x 2 time periods). All regressions include the full vector of control variables from column 6 of Table 3. Robust standard errors in parentheses are clustered on state. Models are weighted by start of period commuting zone share of national population. ~ p ≤ 0.10, * p ≤ 0.05, ** p ≤ 0.01.

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources
& measurement

Empirical approach

IV Strategy

Result

Beyond
manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

Wage effect

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 (1)	College (2)	Non- College (3)	All Workers (4)	College (5)	Non- College (6)
<u>A. Log Change in Number of Workers</u>						
(Δ Imports from China to US)/Worker	-4.231 (1.047)	** (1.181)	-3.992 (1.243)	** (0.651)	-0.274 (0.590)	0.291 (0.764)
R ²	0.31	0.30	0.34	0.35	0.29	0.53
<u>B. Change in Average Log Wage</u>						
(Δ Imports from China to US)/Worker	0.150 (0.482)	0.458 (0.340)	-0.101 (0.369)	-0.761 (0.260)	** (0.297)	-0.743 (0.246)
R ²	0.22	0.21	0.33	0.60	0.54	0.51

Notes: N=1444 (722 commuting zones x 2 time periods). All regressions include the full vector of control variables from column 6 of Table 3. Robust standard errors in parentheses are clustered on state. Models are weighted by start of period commuting zone share of national population. ~ p ≤ 0.10, * p ≤ 0.05, ** p ≤ 0.01.

Public transfer payment

Table 8. Imports from China and Change of Government Transfer Receipts in Commuting Zones, 1990-2007: 2SLS Estimates.
Dep Vars: 10-Year Equivalent Log and Dollar Change of Annual Transfer Receipts per Capita (in log pts and US\$)

	Total Individ Transfers		TAA Benefits		Unemp- loyment Benefits		SSA Re- tirement Benefits		SSA Disability Benefits		Medical Benefits		Federal Income Assist		Other Income Assist		Educ/ Training Assist	
	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)	
<u>A. Log Change of Transfer Receipts per Capita</u>																		
(Δ Imports from China to US)/Worker	1.01 (0.33)	**	14.41 (7.59)	~	3.46 (1.87)	~	0.72 (0.38)	~	1.96 (0.69)	**	0.54 (0.49)		3.04 (0.96)	**	1.08 (2.20)		2.78 (1.32)	*
R ²	0.57		0.28		0.48		0.36		0.32		0.27		0.54		0.37		0.33	
<u>B. Dollar Change of Transfer Receipts per Capita</u>																		
(Δ Imports from China to US)/Worker	57.73 (18.41)	**	0.23 (0.17)		3.42 (2.26)		10.00 (5.45)	~	8.40 (2.21)	**	18.27 (11.84)		7.20 (2.35)	**	4.13 (4.44)		3.71 (1.44)	**
R ²	0.75		0.28		0.41		0.47		0.63		0.66		0.53		0.30		0.37	

Notes: N=1444 (722 commuting zones x 2 time periods), except N=1436 in column 2, panel A. Results for TAA benefits in column 2 are based on state-level data that is allocated to commuting zones in proportion to unemployment benefits. Unemployment benefits in column 3 include state benefits and federal unemployment benefits for civilian federal employees, railroad employees, and veterans. Medical benefits in column 6 consist mainly of Medicare and Medicaid. Federal income assistance in column 7 comprises the SSI, AFDC/TANF, and SNAP programs while other income assistance in column 8 consists mainly of general assistance. Education and training assistance in column 9 includes such benefits as interest payments on guaranteed student loans, Pell grants, and Job Corps benefits. The transfer categories displayed in columns 2 to 9 account for 96% of total individual transfer receipts. All regressions include the full vector of control variables from column 6 of Table 3. Robust standard errors in parentheses are clustered on state. Models are weighted by start of period commuting zone share of national population. ~ p ≤ 0.10, * p ≤ 0.05, ** p ≤ 0.01.

Household income

Table 9. Imports from China and Change in Household Income, 1990-2007: 2SLS Estimates.
Dependent Variable: 10-Year Equivalent Relative Growth and Absolute Dollar Change of Average and Median Annual Household Income per Working-Age Adult (in %pts and US\$)

	Average HH Income/Adult by Source				Median HH Inc./Ad.	
	Total	Wage-Salary	Business Invest	SocSec +AFDC	Total	Wage-Salary
	(1)	(2)	(3)	(4)	(5)	(6)
<u>A. Relative Growth (%pts)</u>						
(Δ Imports from China to US)/Worker	-1.48 ** (0.36)	-2.14 ** (0.59)	-0.51 (0.74)	2.12 ** (0.58)	-1.73 ** (0.38)	-2.32 ** (0.51)
R ²	0.69	0.43	0.76	0.52	0.53	0.52
<u>B. Dollar Change</u>						
(Δ Imports from China to US)/Worker	-492.6 ** (160.4)	-549.3 ** (169.4)	40.1 (116.7)	17.3 ** (4.3)	-439.9 ** (112.7)	-476.5 ** (122.2)
R ²	0.63	0.40	0.72	0.51	0.49	0.48

Notes: N=1444 (722 commuting zones x 2 time periods). Per capita household income is defined as the sum of individual incomes of all working age household members (age 16-64), divided by the number of household members of that age group. Total income comprises wage and salary income; self-employment, business and investment income; social security and welfare income; and income from other non-specified sources. Social security and welfare income in column 4 includes social security retirement, disability, and supplementary income, aid to families with dependent children (AFDC), and general assistance. All regressions include the full vector of control variables from column 6 of Table 3. Robust standard errors in parentheses are clustered on state. Models are weighted by start of period commuting zone share of national population. ~ p ≤ 0.10, * p ≤ 0.05, ** p ≤ 0.01.

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employement effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

Robustness check

(1) modify the definition of exposure—China's growth not only displaces U.S. producers in the U.S. market but may also affect U.S. sales in the foreign markets that U.S. industries serve.

$$\sum_j \frac{E_{ij,t}}{E_{uj,t}} \frac{\Delta M_{ucjt} + \sum_{o \neq c} \frac{X_{oujt}}{X_{ojt}} \Delta M_{ocjt}}{E_{it}}$$

(2) Exposure to final Goods and Intermediate Inputs—using total China imports per worker less China imports of intermediate inputs per worker

Robustness check

(3) Net Chinese Imports per Worker

$$\sum_j \frac{E_{ijt}}{E_{ujt}} \frac{\Delta M_{ucjt}}{E_{it}} - \sum_j \frac{E_{ijt}}{E_{ujt}} \frac{\Delta X_{cujt}}{E_{it}}$$

(4) An alternative to studying net import effects—use the gravity-based approach to measure the exposure

(5) Use the factor content of U.S. net imports from China to replace imports per worker

$$\sum_j \frac{E_{ijt}}{E_{ujt}} \frac{\tilde{E}_{uj0}}{V_{uj0}} \frac{\Delta M_{ucjt}}{E_{it}} - \sum_j \frac{E_{ijt}}{E_{ujt}} \frac{\tilde{E}_{uj0}}{V_{uj0}} \frac{\Delta X_{cujt}}{E_{it}}$$

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources
& measurement

Empirical approach

IV Strategy

Result

Beyond
manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

Robustness check

Table 10. Adding Exposure to Indirect Import Competition or Exposure to Net Imports, 1990-2007:
2SLS and OLS Estimates.

Dependent Variables: 10-Year Equivalent Changes of Indicated Variables

	I. Employment/Pop		II. Log Wages		III. Transfers, Wage Inc			
	Mfg (1)	Non-Mfg (2)	Mfg (3)	Non-Mfg (4)	Log Transfers (5)	Avg Log HH Wage Inc (6)		
<u>A. Baseline Results: Gross Chinese Imports per Worker (2SLS)</u>								
(Δ Imports from China to US)/Worker	-0.60 (0.10)	** -0.18 (0.14)	0.15 (0.48)	-0.76 (0.26)	** 1.01 (0.33)	** -2.14 (0.59)		**
<u>B. Domestic Plus International Exposure to Chinese Exports (2SLS)</u>								
(Δ Domestic + Intn'l Exposure to Chinese Imports)/Worker	-0.42 (0.05)	** -0.10 (0.10)	0.11 (0.33)	-0.47 (0.18)	** 0.87 (0.22)	** -1.75 (0.43)		**
<u>C. Exposure to Final Goods and Intermediate Inputs (2SLS)</u>								
(Δ Imports from China to US net of I'med Inputs)/Worker	-0.49 (0.12)	** -0.01 (0.20)	0.71 (0.52)	-0.41 (0.37)	0.84 (0.36)	* -1.47 (0.88)		~
<u>D. Net Chinese Imports per Worker (2SLS)</u>								
(Δ Net Imports of US from China)/Worker	-0.45 (0.10)	** -0.09 (0.15)	0.45 (0.42)	-0.47 (0.27)	~ 0.73 (0.35)	* -1.64 (0.65)		*
<u>E. Change in China-US Productivity Differential (OLS Gravity Residual)</u>								
Δ Comparative Advantage China (Gravity Residual)	-0.29 (0.04)	** -0.03 (0.08)	0.04 (0.28)	-0.26 (0.15)	~ 0.53 (0.14)	** -0.93 (0.28)		**
<u>F. Factor Content of Net Chinese Imports per Worker (2SLS)</u>								
(Δ Factor Content of Net Imports from China)/Worker	-0.57 (0.10)	** -0.12 (0.15)	0.59 (0.50)	-0.66 (0.26)	* 0.81 (0.36)	* -1.90 (0.60)		**

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources
& measurement

Empirical approach

IV Strategy

Result

Beyond
manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy

Result

Beyond manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

The China Syndrome

Author: David H.
Autor; David Dorn;
Gordon H. Hanson

Reported by: MENG
Ke

Content

Introduction

Conclusion

Background

A Shift-Share Method

Data Sources
& measurement

Empirical approach

IV Strategy

Result

Beyond
manufacturing

population effect

employment effect

Wage effect

Public transfer payment

Household income

Robustness check

Conclusion

Conclusion

- ▶ The EXPOSURE to Chinese import competition affects US local labor markets
- ▶ The rising EXPOSURE increase unemployment, lowers labor force participation and reduces wages in local labor market.
- ▶ This effect explains 1/4 of the contemporaneous aggregate decline in U.S. manufacturing employment.

Thank you

Thank you for listening!

The China Syndrome

Author: David H.
Autor; David Dorn;
Gordon H. Hanson

Reported by: MENG
Ke

Content

Introduction

Conclusion
Background
A Shift-Share Method

Data Sources
& measurement

Empirical approach
IV Strategy
Result

Beyond
manufacturing
population effect
employment effect
Wage effect
Public transfer payment
Household income
Robustness check

Conclusion

Questions?

Author: David H.
Autor; David Dorn;
Gordon H. Hanson

Reported by: MENG
Ke

Content

Introduction

Conclusion
Background
A Shift-Share Method

Data Sources & measurement

Empirical approach

IV Strategy
Result

Beyond manufacturing

population effect
employment effect
Wage effect
Public transfer payment
Household income
Robustness check

Conclusion