

The Enduring Consequences of the China Trade Shock: Myths and Measurement

David Autor

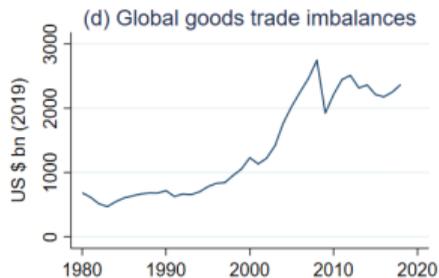
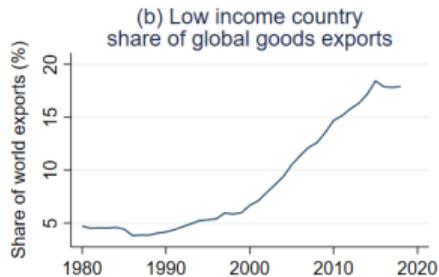
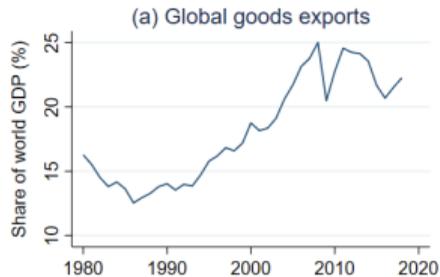
MIT, NBER, and Center for Shaping the Future of Work

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Context – China's historic rise

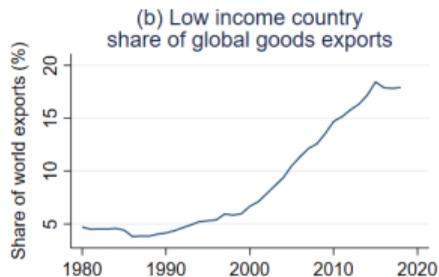
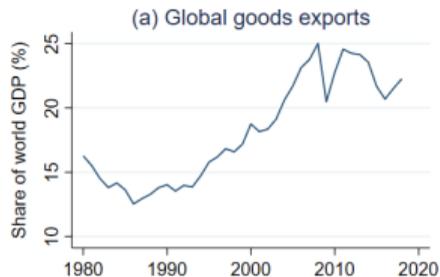
Fundamental changes in patterns of international trade starting in the 1990s



Four crucial changes in world trade

- 1 Rising world trade in goods
- 2 Rising share of low-income countries in world exports
- 3 Rising share of global value chains in world trade
- 4 Growing trade imbalances

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Four crucial changes in world trade

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China is central to all of these shifts

The view of Shenzhen from Hong Kong, 1970 and 2019



Shenzhen from Hong Kong, 1970

In the 1970s, Shenzhen, China was a small fishing settlement.

1970

The View of Shenzhen from Hong Kong, 1970 and 2019



1970



2019

The view of Shenzhen from Hong Kong, 1970 and 2019



1970



2019

The view of Gordon Hanson, 1970 and 2019



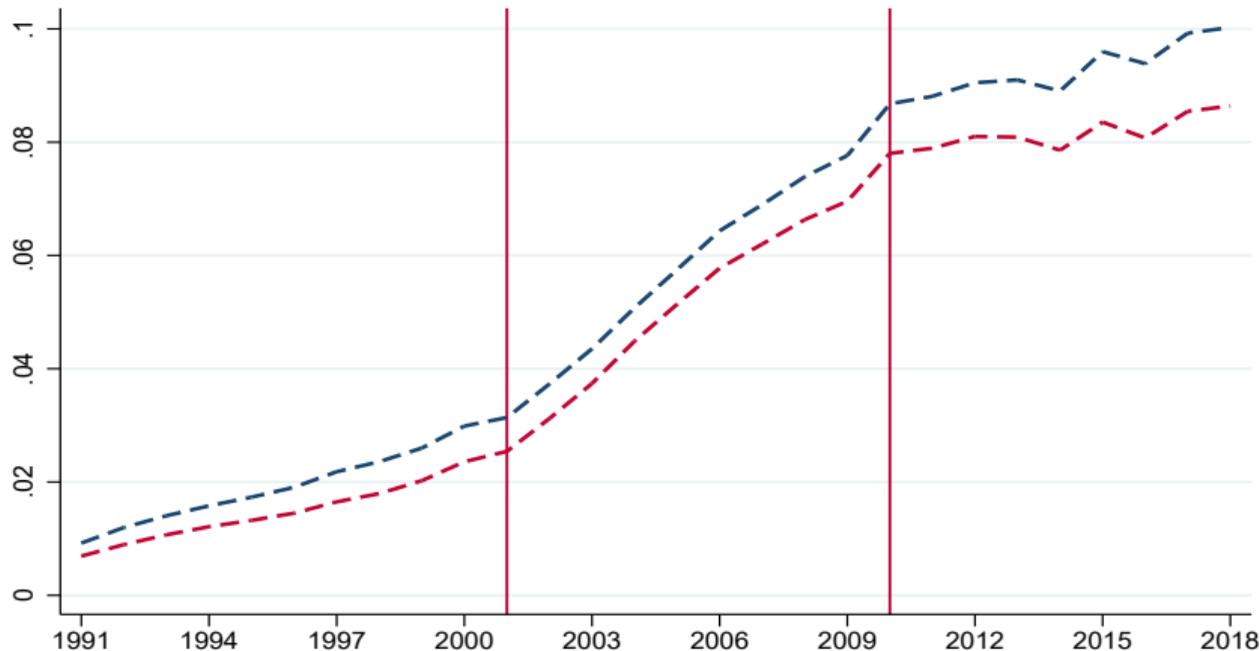
1970



2019

China's import penetration in the US market: China alone & China + SE Asia

Initiation 1991-2000, intensification 2001-2010, stabilization 2010-2019



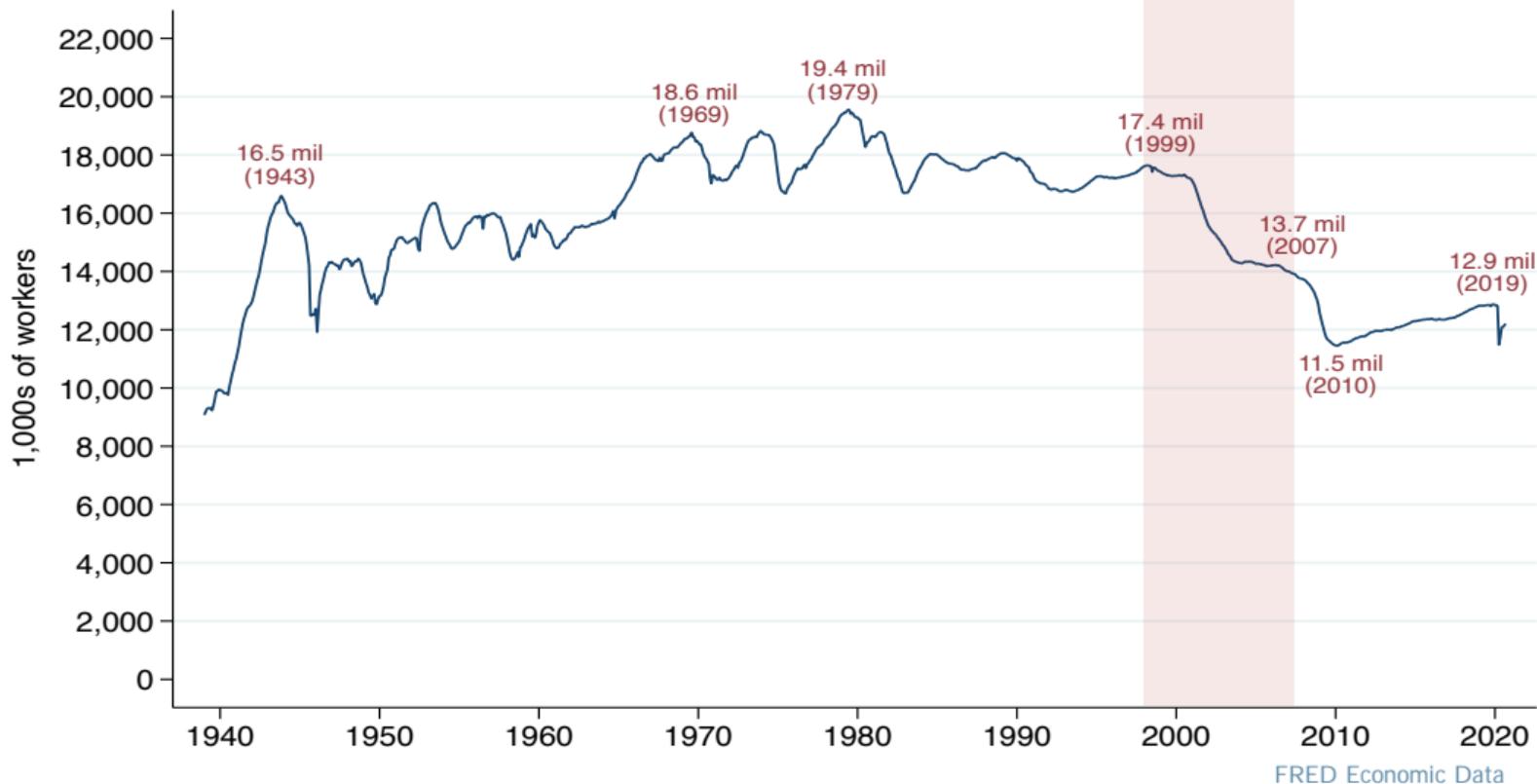
--- China import penetration in the US
--- China + SE Asia import penetration in the US

The enduring consequences of the China trade shock: **Misconceptions**

- ① US manufacturing jobs were gradually dwindling for decades

Myth #1: U.S. manufacturing employment slowly declining for decades

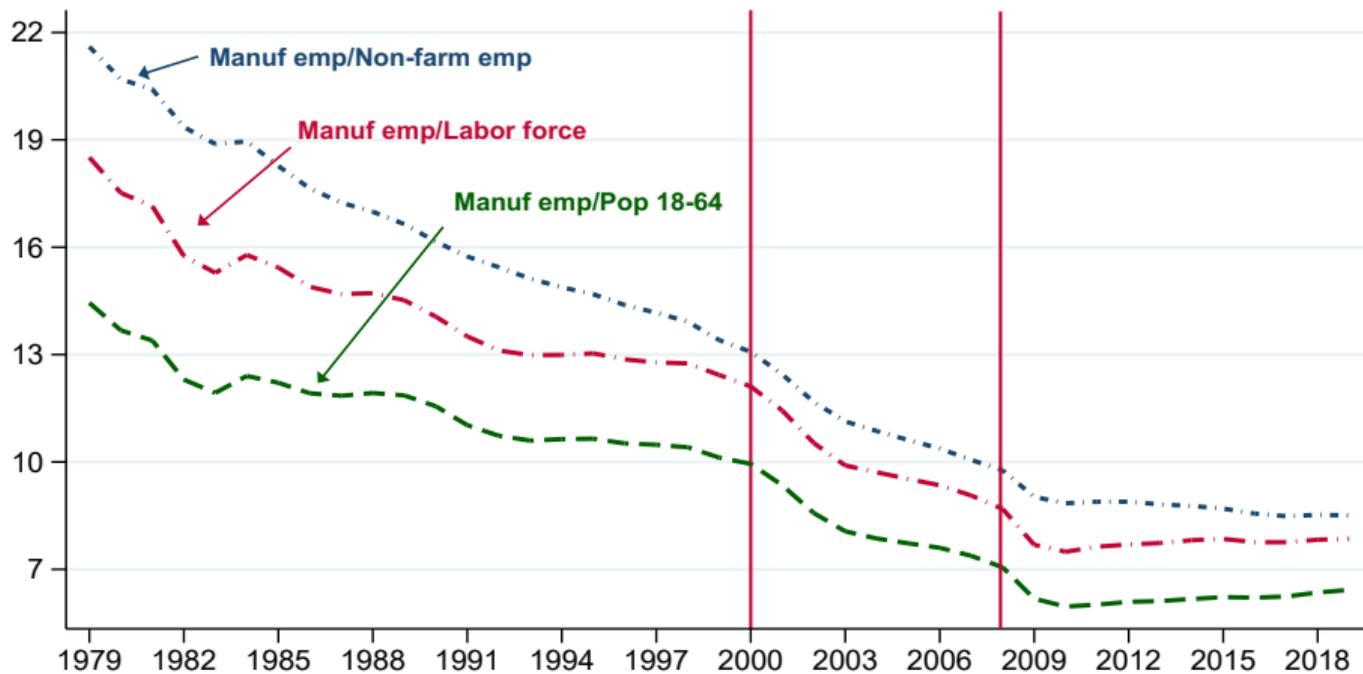
Historic fall: 17.4m in 1999 / 13.7m in 2007, a drop of more than a fifth



Myth 1: U.S. manufacturing employment slowly declining for decades

A clear inflection point in U.S. manufacturing employment after the year 2000

U.S. Manufacturing Employment 1979 – 2019
as a Share of Employment, Labor Force, and Working-Age Population



Industry shocks, worker adjustment

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- ② Job losses were caused by technology not trade pressure

Myth #2: Job losses were caused by technology not trade pressure

Chinese import exposure / prices, & empl in U.K. 1999-'07

Goods Prices

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Goods Prices

Emp in Goods-Producing Sectors

Dorn & Levell, '21

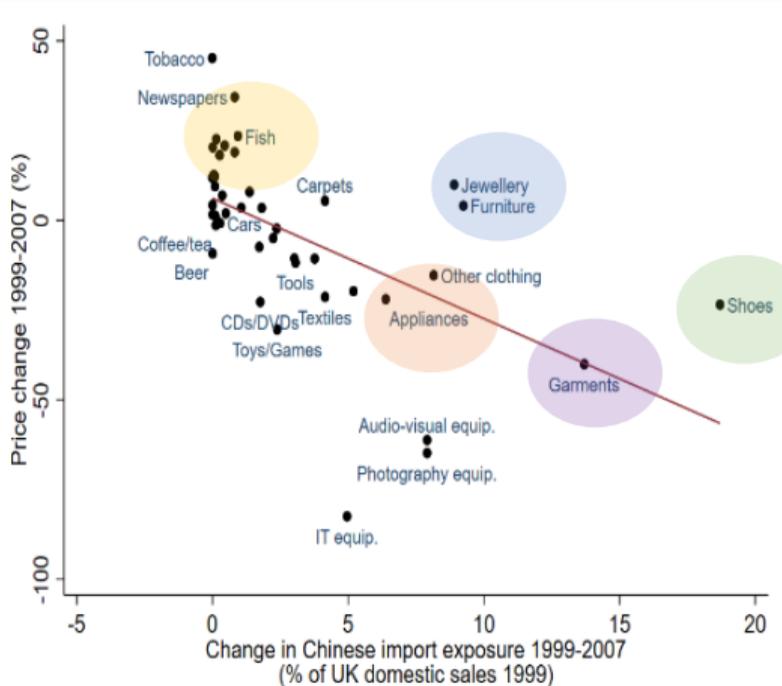
Trade pressure caused domestic goods prices & goods employment to drop

■

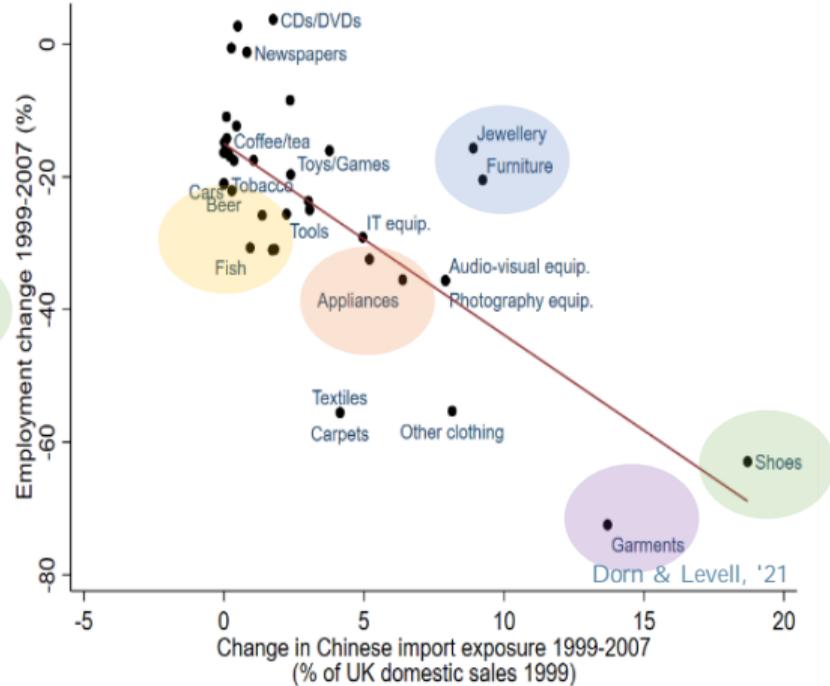
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The effects of industry-level trade pressure on workers' careers

Involuntary job loss induces large, sustained lifetime earnings losses

Classic labor literature, starts with Jacobson, LaLonde and Sullivan '93

Repeatedly replicated and affirmed

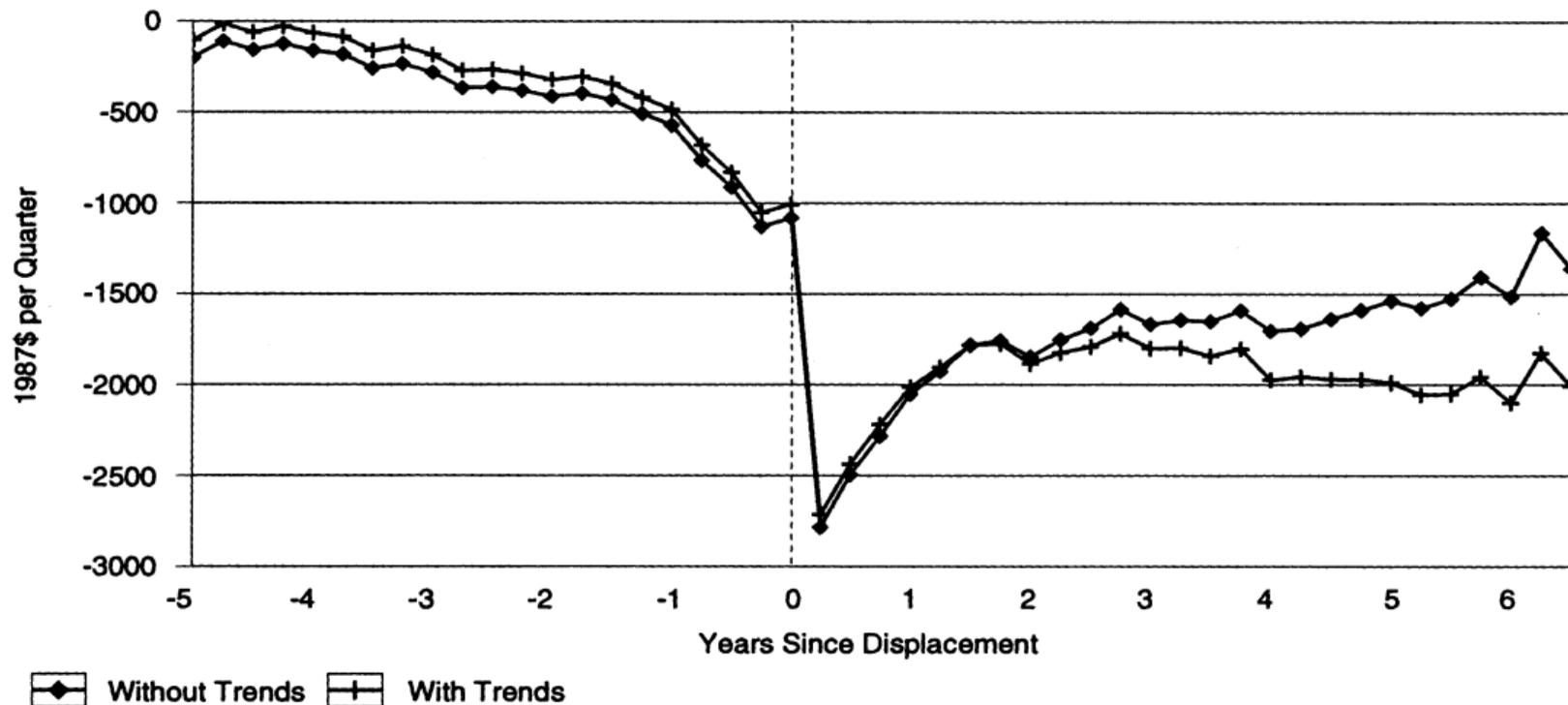
Manufacturing trade deficits amplify these effects

A longstanding insight, receives modern treatment in Dix-Carneiro et al. '22

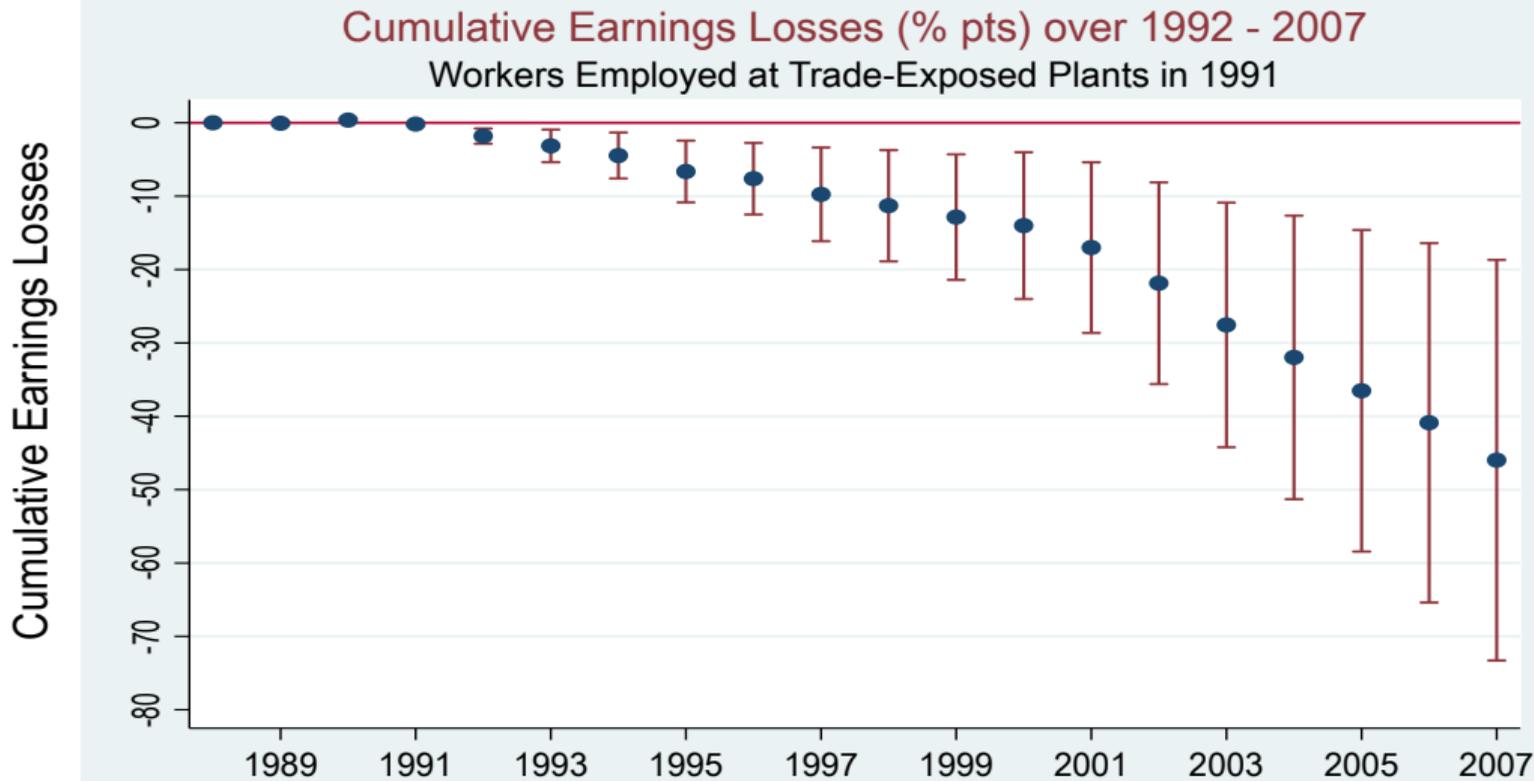
To maintain full employment with rising manufactured goods deficit, need substantial reallocation of workers *out of manufacturing* and *into services*

Classic labor finding: Long-term adverse consequences of job displacement

Quarterly earnings losses of high-attachment workers subject to mass layoff



Median cumulative earnings losses for trade-exposed workers



Median excess job changes for trade-exposed workers

Why do worker earnings losses keep rising a decade after exposure?

Annual earnings losses concentrated among low-earnings workers

Trade economists have read Jacobson, LaLonde and Sullivan!

Contemporary models embrace the notion of frictional adjustment

Search frictions often modeled as in Diamond-Mortenson-Pissarides. See Helpman, Itshoki, and Redding '10; Helpman et al. '17; Dix-Carneiro '14

But DMP models unable to rationalize huge earnings losses | and even elevated mortality odds | caused by job loss, e.g., Sullivan & Von Wachter '09, Davis & Von Wachter '11

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Other GE trade models treat `not working' as just another occupational choice

Job loss has close to zero impact on welfare if it's just another occupation

Only [Kim-Vogel '21](#) provide GE model with explicit disutility from not working

Market non-integration and local general equilibrium effects

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- ② Job losses were caused by technology ~~trade~~ pressure
- ③ **Long run labor mobility equalizes real living standards spatially**

Myth #3: Long run labor mobility equalizes real living standards

Migration rates v. income per capita, 1940{1980

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Migration rates v. income per capita, 1940{1980 and 1980{2010

Consider a commuting zone (CZ) as a small open economy

Suppose China has a TFP shock or a fall in trade costs

What is the impact on the demand for goods produced by a CZ?

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Using standard Eaton-Kortum '02 setup, Autor-Dorn-Hanson '13 derive:

In demand for goods produced by CZ across all industries

$$Q_i = \sum_j \frac{X_{uj}}{X_{uj}} \frac{X_{ucj} (\hat{A}_{cj} \hat{\alpha}_{cj})}{Q_i}$$

Q_i is total output in CZ i

$X_{uj} = X_{uj}$ is CZ i 's sales as a share of US purchases in industry j

$X_{ucj} (\hat{A}_{cj} \hat{\alpha}_{cj})$ is growth in US imports from China due to TFP or

Q_i serves as a CZ-level China trade exposure index

Allocates exogenous component of China goods imports to CZs according to their initial output of those goods

Empirical implementation

Empirical proxy for CZ's import exposure

$$IP_{uit} = \sum_j \frac{E_{ijt}}{E_{jt}} \frac{M_{ucjt}}{E_{it}}$$

IP_{uit} is trade-induced demand shock for CZ's goods output

Allocates to each CZ a share of total national import growth

Divides this import value by a CZ's total employment

Yields measure of "import growth per worker" (in \$1,000's of USD)

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Two sources of variation in this Bartik-style measure (Borusyak et al '22)

- 1 CZ's initial manufacturing share | Controlled variation ('share' measure)
- 2 CZ's manufacturing industry mix | Identifying variation ('shift' measure)

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Caveat|ignores indirect effects through other regions/ countries/ industries

Autor, Dorn, Hanson '13 explored indirect geographic effects | appear to be second order

Acemoglu et al. '16 show that industry input-output linkages magnify these effects

Concentrated exposure: South Atlantic, South Central, Northeast, Great Lakes

Commuting Zone level regression analysis

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

$$Y_{it+h} = \alpha + \beta h + \gamma IP_i^{CU} + X_{it}^0 + \epsilon_{it+h}$$

Y_{it+h} = change in outcome

Employment-population ratio, log population headcount, log personal income per capita, log gov't transfers per capita

IP_i^{CU} = change in Chinese import penetration over 2000-2012

Instrument following approach in [ADH '13](#), [Acemoglu et al '16](#): Use covariance between industry-level Chinese import growth in other high-income countries vs. U.S.

X_{it} = Census region time trends, initial-period controls

CZ emp. shares for manuf., women, routine, non-shorable jobs; pop. shares for college-educated, foreign-born, non-white, age cohorts

Large, enduring falls in manufacturing, wage & salary employment, 2001-2018

Manufacturing/Pop

Employment/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.

Effect of trade shock visible across quantiles of wage distribution

Male Wage Dist'n

Female Wage Dist'n

Beyond job loss: Social consequences of the trade shock

A neighborhood in which people are poor but employed is different from a neighborhood in which people are poor and jobless. Many of today's problems in the inner-city ghettos|crime, family dissolution, welfare, low levels of social organization, and so on|are fundamentally a consequence of the disappearance of work

|William Julius Wilson, *When Work Disappears*|1996

Localized impacts: The case of West Hickory, North Carolina

A fall in marriages

Causal effect on fraction married or living with spouse, women ages 18-39

A rise in fraction of children < 18 living in poverty, non-married households

Causal effect on fraction of children in poverty, non-married households

An increase in 'deaths of despair'

Causal effect on mortality per 100K among adults Ages 20 { 39

Scarring effects present a puzzle not adequately captured in theory

Why don't local labor markets rapidly rebound?

Positive shocks generate growth, of course

But large negative shocks leave scars that persist and metastasize

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These dynamics sort-of captured by Dix-Carneiro & Kovak '17, but...

- ① 'Specific factors' is a coarse shorthand for what's going on
- ② And they do not imply the non-smooth asymmetries that we see in reality

Assessing welfare impacts |
GE meets local labor markets

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- ③ Long run labor mobility equalizes real living standards spatially
- ④ **Free-trade is Pareto improving**

Myth #4: Free-trade is Pareto improving

If economists ruled the world, there would be no need for a World Trade Organization (WTO). The economist's case for free trade is essentially a unilateral case: a country serves its own interests by pursuing free trade regardless of what other countries may do

|Krugman, *Journal of Economic Literature* 1997

Saying the quiet part quietly | in the textbook

Owners of a country's abundant factors gain from trade, but owners of a country's scarce factors lose. . . This means that international trade tends to make low-skilled workers in the United States worse off (not just temporarily, but on a sustained basis)

|Krugman and Obstfeld, *International Economics: Theory and Policy* 2008

Challenge: Assessing welfare effects using evidence from local labor markets

If labor is fully mobile across regions and sectors, change in welfare is common across regions

But we see persistent, local labor market effects

To rationalize these differences, theory requires adjustment frictions

Most models assume labor market frictions

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To quantify these welfare effects, we need two things

- 1 An estimate of the mean gain from trade ('the intercept')
- 2 An estimate of the diversity of these gains ('the variance')

Trade models produces modest estimates of the variance of localized impacts

Caliendo et al '19: costly labor mobility

Estimate mobility elasticity from $E \ln \frac{w_{t+1}^k}{w_t^k} = \frac{1}{h} \sum_j \ln w_{t+1}^j = w_{t+1}^j$
% W (std : dev :) = 0:20 (0:09) in long run (12 years)

Galle et al '20: specific factors

Estimate labor specificity from $E[\ln \hat{\phi}_j \ln \hat{\phi}_{jNM}]$
% W (std : dev :) = 0:22 (0:25), similar w/ home prod., unemployment.

Adao et al '20: agglomeration effects

Estimate agglom, employ elasticities, from $E \ln \frac{w_j}{w_j^h}; \ln \hat{L}_j^P; \hat{L}_j^C$
% W (std : dev :) = 0:16 (1:75)

Related work

Rodriguez-Clare et al '20: Downward nominal wage rigidities

Kim & Vogel '20: Non-pecuniary losses from unemployment

Relative changes in CZ welfare

Trade-shock induced change in welfare for CZ i (conditional on controls) relative to the population-weighted US mean (ADH '21):

$$\ln \hat{W}_i = \sum_h s_h \ln \hat{W}_h = \sum_h s_h \ln \hat{y}_h$$

$$= \tilde{\gamma}_y \sum_h s_h \tilde{\gamma}_h \hat{P}_h^{cu}$$

s_i = initial share of CZ i in US population

\hat{y}_i = trade-shock induced change in income per capita in CZ i

$\tilde{\gamma}_y$ = estimated impact coefficient for $\ln y$ over time interval

\hat{P}_i^{cu} = exogenous component of trade shock for CZ i (observed trade shock
 $\hat{\Delta}$ adj. R^2 in 1st stage regression)

Trade-shock-induced variance in 4 Income per capita: $\hat{\sigma} = 1:35$

Unweighted distribution of CZ changes (deviation from pop.-weighted mean)

2000-2012 Trade Shock

Note: Wted (unwted) std. dev. of shock impact: 1:35 (0:89); N = 722, 36 bins.

Autor, Dorn, Hanson '21

What fraction of CZs/residents experienced net welfare losses?

Aggregate gains from trade | the intercept

In Caliendo et al '19, Galle et al '20, aggregate gains from trade are 0.22%

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Hard to escape the conclusion that there are losers as well as winners

Note that house prices fall after China Shock|but so do public goods (Feler & Senses '17)

Putting the pieces together

① The scarring effects of the China trade shock were startlingly pronounced

Scale and concentration in space and time

Concentrated on specialized regions with low levels of human capital

Underappreciated barriers to labor mobility: housing, family, age/skill

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② The social consequences extended beyond the labor market

Caused numerous signs of social distress (marriage, household structure, health)

Catalyzed political polarization along cultural fault lines (Autor et al. '20, Bonomi et al. '21, Grossman-Helpman '21)

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③ Impacts change our understanding of how labor markets adjust to trade

Lessons learned

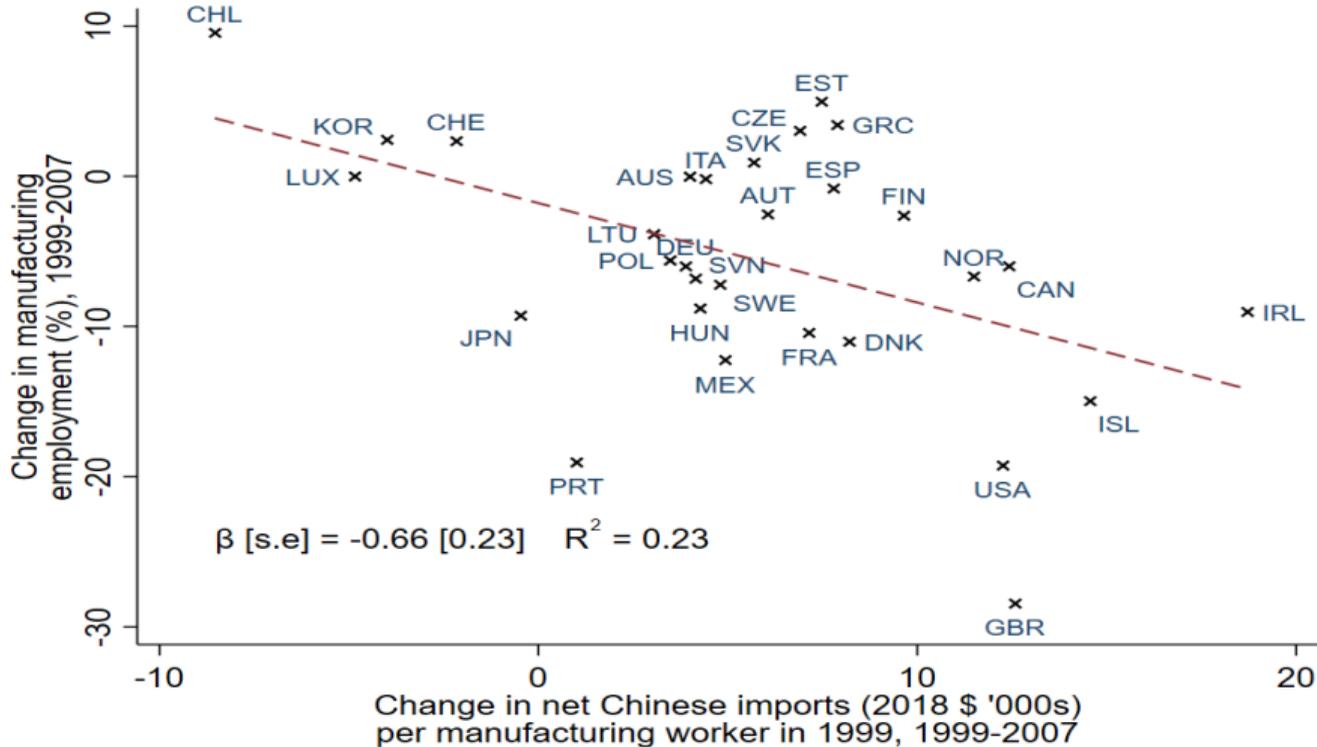
Economists, myself included, have tended to underplay the disruptive effects of rapid change. (...) Many of us feel that we missed something important about the downsides of rapid globalization

| Krugman, *New York Times*, '21

**Final myth-conception: US labor
market is uniquely dysfunctional**

Misconception #5: The U.S. labor market is uniquely dysfunctional

Manufacturing emp/pop vs. Chinese import competition, 1999-'07



Thank you