When Work Disappears: Manufacturing Decline and the Falling Marriage-Market Value of Young Men

David Autor [1]   David Dorn [2]   Gordon Hanson [3]
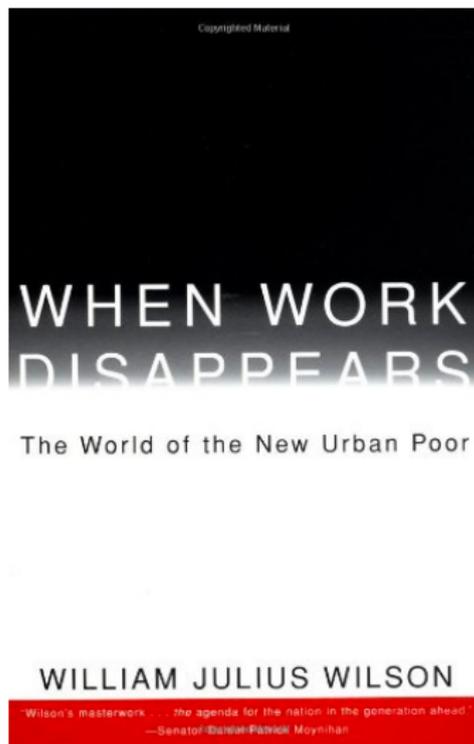
[1]MIT and NBER

[2]University of Zurich and CEPR

[3]UCSD and NBER

"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."

WHEN WORK DISAPPEARS

The World of the New Urban Poor

WILLIAM JULIUS WILSON

"Wilson's masterwork . . . the agenda for the nation in the generation ahead."
—Senator Daniel Patrick Moynihan

"Wilson's book spoke to me. I wanted to write him a letter and tell him that he had described my home perfectly. That it resonated so personally is odd, however, because he wasn't writing about the hillbilly transplants from Appalachia—he was writing about black people in the inner cities."
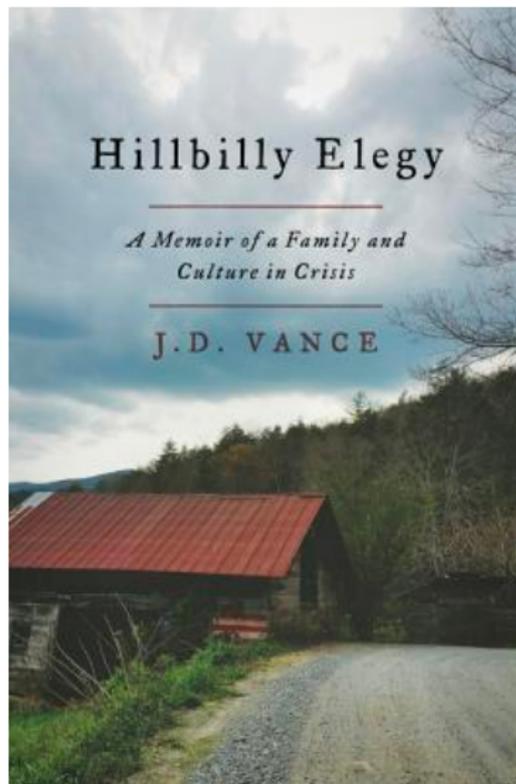
Wilson and Becker on Earnings, Marriage, Family Structure

Becker '73

- Gains to marriage arise (partly) from spousal earnings differences, spurring household specialization
- If males specialize in market work, adverse shock to male earnings reduces marriage and (if children a normal good) fertility

William Julius Wilson '86, '87, '96 (draws on Becker)

- Decline of U.S. blue-collar jobs has shrunk pool of economically secure young adult men
- Implication: Reduced women's gains from marriage, eroded traditional parental roles, imperiled children

These hypotheses are partly distinct

- Becker model—*relative* economic stature and specialization
- Wilson further—holding *relative* gender earnings diffs constant, *absolute* falls in male economic stature reduce value of marriage
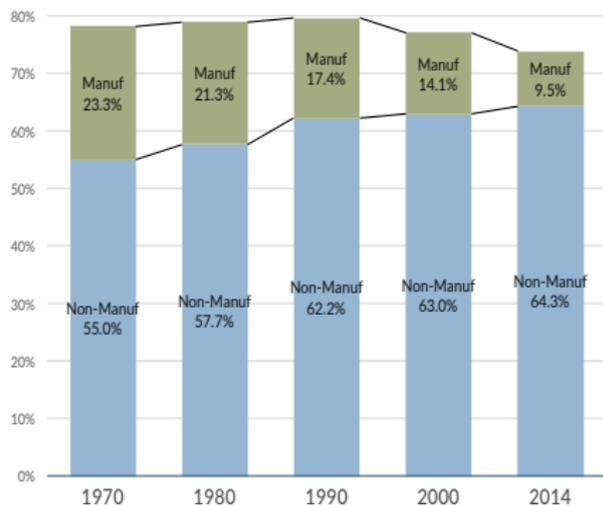- Hard to disentangle (we don't solve this problem). But fascinating...

Agenda

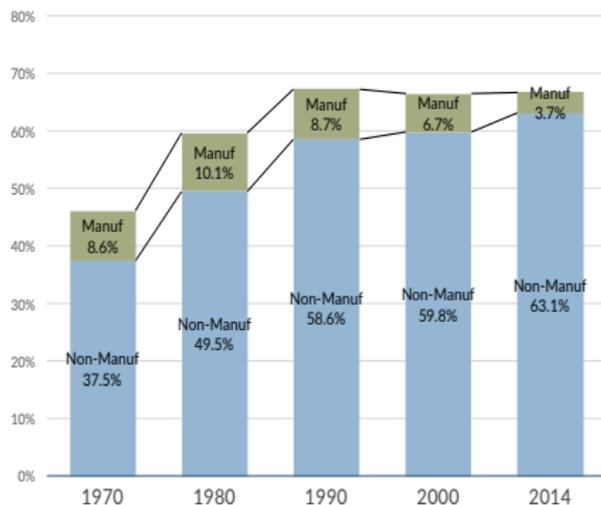# U.S. Manufacturing Employment Fell by 22% Between 1999 – 2007, by 34% Between 1999 – 2010

In 1970, 2/3^{rds} of Young Manuf Workers Were Men
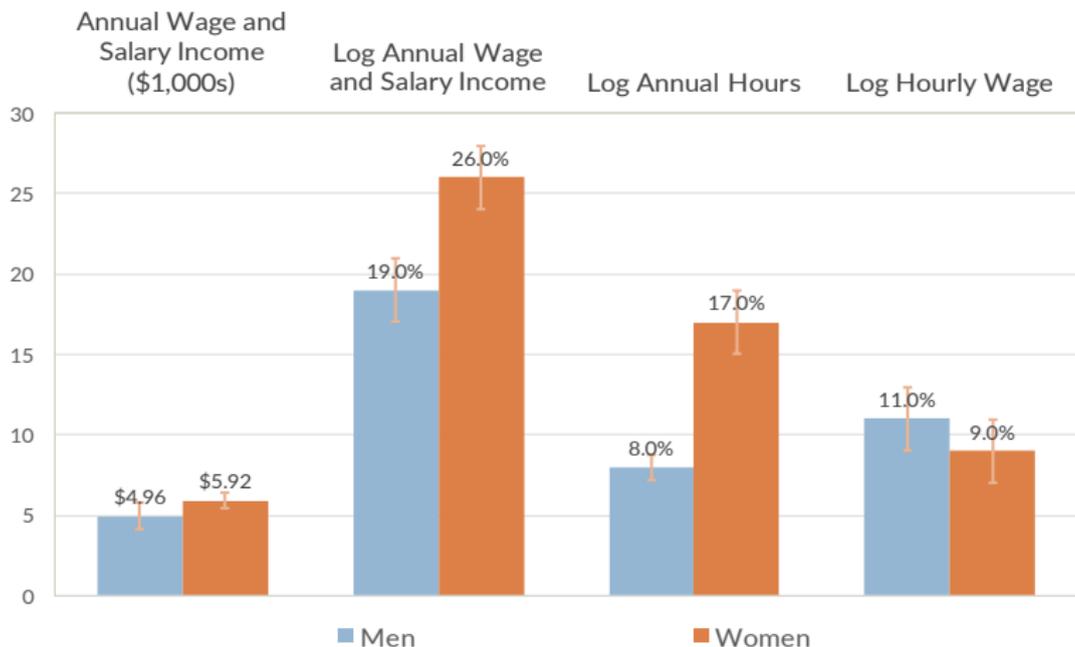# In 2014, 3/4^{ths} of Young Manuf Workers Were Men

Emp Status: Men 18 - 39

	1970	1980	1990	2000	2014
Manuf	23.3%	21.3%	17.4%	14.1%	9.5%
Non-Manuf	55.0%	57.7%	62.2%	63.0%	64.3%

Emp Status: Women 18 - 39

	1970	1980	1990	2000	2014
Manuf	8.6%	10.1%	8.7%	6.7%	3.7%
Non-Manuf	37.5%	49.5%	58.6%	59.8%	63.1%

Manufacturing Jobs Offered High Earnings to Low Education Men: Estimates of 'Premium' in Year 2000 Census Data


Estimates based on Census 2000 data are conditional on age, education, race, ethnicity, and CZone fixed effects

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4. Man Down: Employment & Earnings

5. Man Out: Idleness, Absence, and Death

6. Testing Becker: Marriage and Cohabitation

7. Testing Becker + Wilson: Fertility, Lone Parenting, and Childhood Poverty

8. Conclusions

In 2009, 40% of U.S. Births Were Out of Wedlock, More than Twice as Prevalent as 1980 (Steady through 2016)

Percentage of Births to Unmarried Women, by Race

Autor & Wasserman, 2013
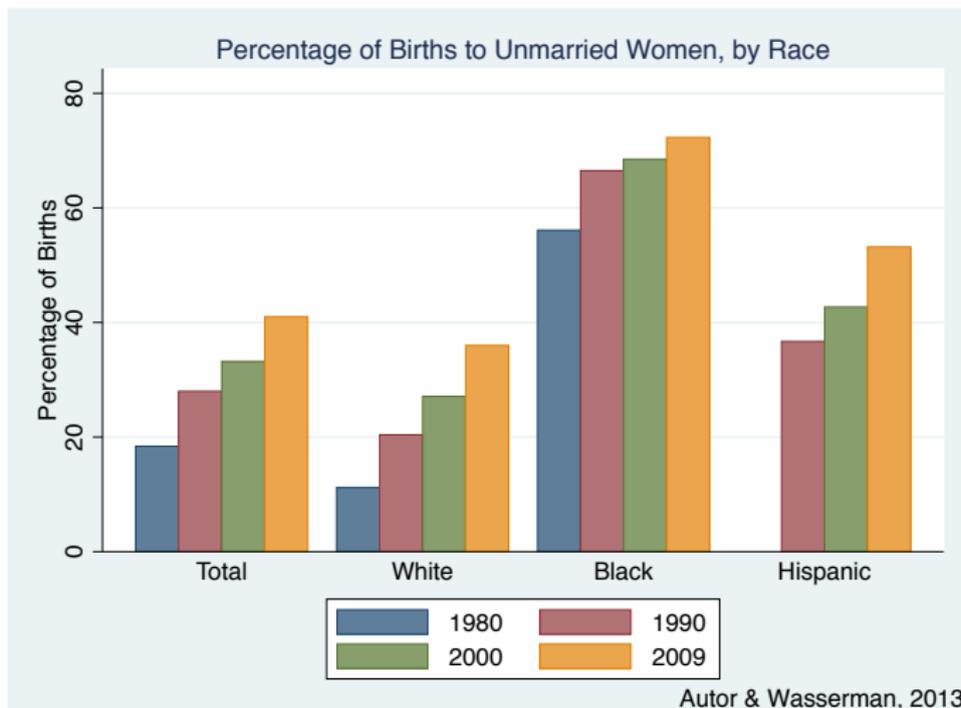
2016 data: Overall 39.8%; Whites 28.5%; Blacks 69.8%; Hispanics 52.6%

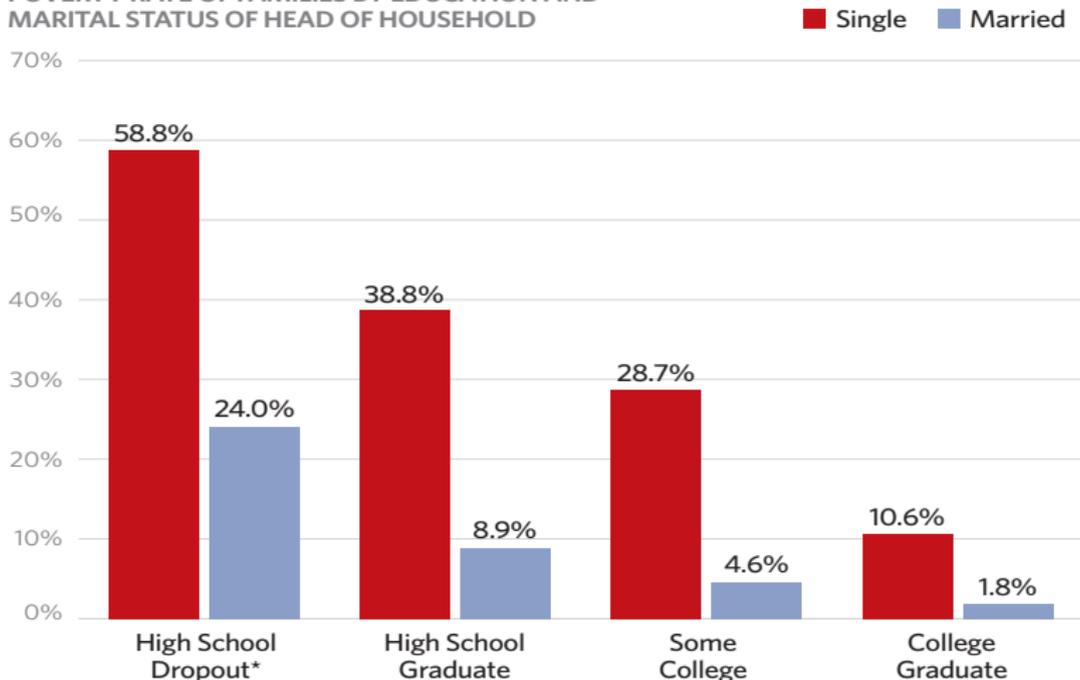# Steep Rise in Fraction of Children < 18 in Single-Headed Households

U.S. Children < 18 Living with Mother Only: 1970 & 2010
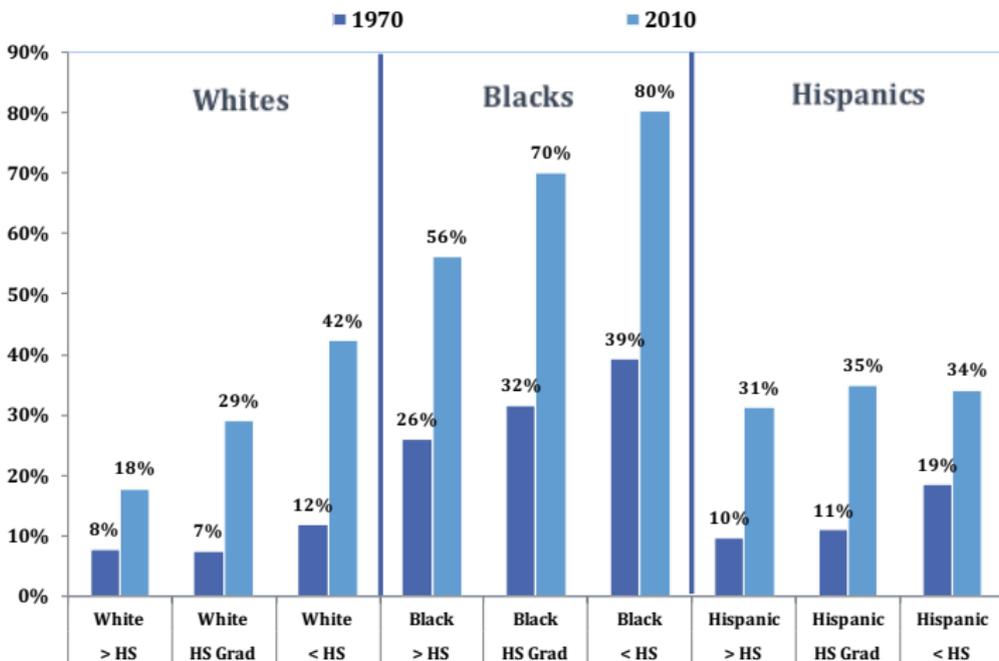
Autor and Wasserman, 2013

Single & Poor: Poverty Far Higher Among Single-Headed HHs at Every Education Level (2008 data)

POVERTY RATE OF FAMILIES BY EDUCATION AND MARITAL STATUS OF HEAD OF HOUSEHOLD

■ Single ■ Married

Rector, 2012

State of Knowledge

Evidence

- Blau, Kahn, Waldfogel '00; Ellwood, Jencks '04; Murray '12; Shenhav '16; Shaller '16
- Black, McKinnish, Sanders '03, '05: Using coal and steel shocks, find effects on welfare receipt, single-headedness
- Bertrand, Kamenica, Pan '15: Marriages in which wife earns more than husband appear to form less frequently, dissolve more frequently
- Kearney, Wilson '17: Fracking booms increase incomes and fertility but do not affect marriage
- Page, Huff Stevens, Lindo '09; Lindo, Hansen, Schaller '16: Parental job loss and adverse outcomes for children
- Charles and Luoh '10: Incarceration as a shock to supply of marriageable males
- Charles, Hurst, and Schwartz '18: Declining manufacturing→falling employment among young non-college males

State of Knowledge

What's missing from extant evidence?

1. Large, well-identified labor market shocks

2. Large, *gender-specific* shocks—affecting relative M v. F earnings
   - Shenhav '16 similar approach at state-level
   - Shenhav's approach based in part on earlier version of this work

3. High resolution data—linking labor market shocks to gender earning status, fertility, marriage, kids' outcomes

What We Add

Exploit well-ID'd trade shocks to manufacturing

- Sizable, sustained effects at local labor market (CZ) level
- Identifiable gender-specific component

Measure direct labor market consequences

- Employment: manufacturing, non-manufacturing, unemployment, NILF
- Distributional effects on earnings (esp. relevant to marriage market)

Explore decline of 'marriageable' men

- Idleness
- Sex ratio
- Mortality

**Assess downstream effects on marriage/ fertility/ childhood poverty**

- Marriage, cohabitation, fertility
- Fertility, children's household structures, childhood poverty

Consider implications for Becker + Wilson

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China's Historic Rise as a World Manufacturing Power

Shares of world manufacturing exports
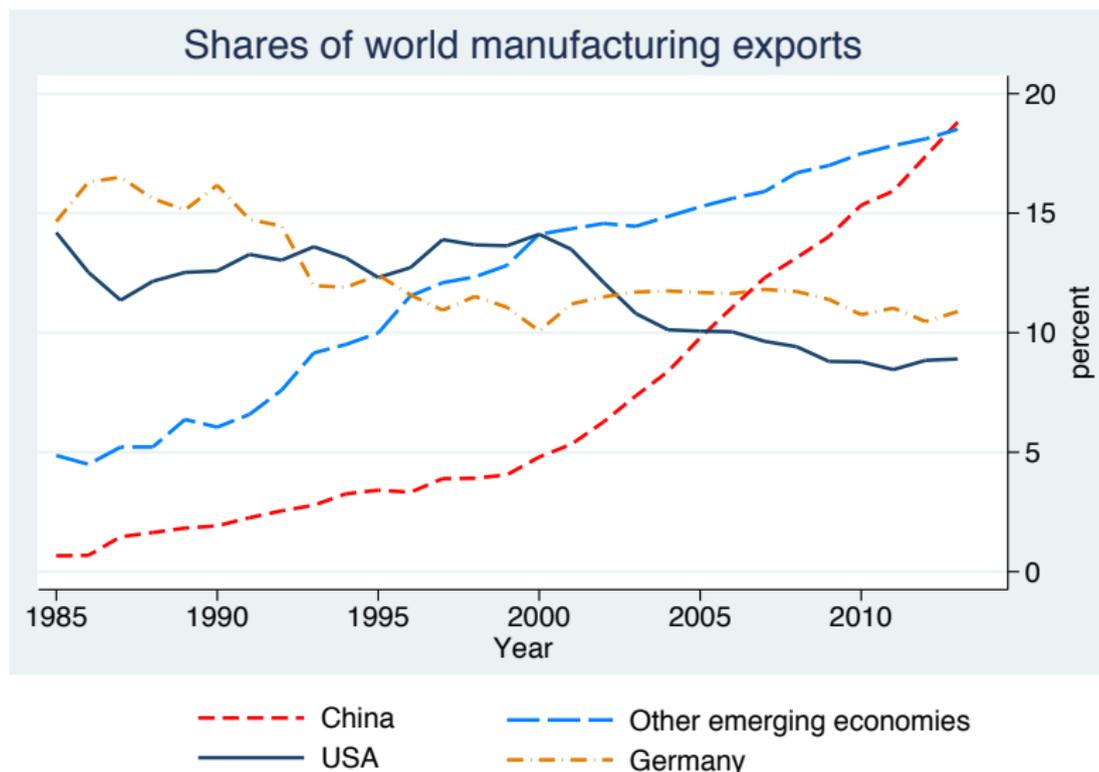
Literature: Labor Market Effect of 'China Shock'

Sizable impact of 'China shock' on U.S. employment, wages

- Bernard, Jensen, Schott '06; Autor, Dorn, Hanson '13; Ebenstein, Harrison, McMillan, Phillips '14; Autor, Dorn, Hanson, Song '14; Pierce, Schott '16
- Explains 30-40% of the decline in manufacturing employment from 1990 to 2007 (Caliendo, Dvorkin, Parro '15; Acemolgu et al. '16)

Impacts concentrated in

1. Import-exposed industries: Pierce, Schott '16; Acemolgu et al. '16
2. Workers employed in exposed firms: Autor, Dorn, Hanson, Song '14
3. Import-exposed local labor markets: Autor, Dorn, Hanson '13

Data

Trade exposure

- UN Comtrade 1991, 2000, 2014: value of goods imports matched to 397 manufacturing industries
- County Business Patterns 1980, 1990: employment in 397 industries in 722 Commuting Zones (CZs)

Outcome variables

- Census 1970, 1980, 1990, 2000, ACS 2013-15: employment, earnings, marital status and household structure in 722 CZs
- Vital Statistics 1990, 2000, 2010: births and deaths in 722 CZs

Focus on population age 18-39

- Focused on the young b/c of marriage/children outcomes
- Races + ethnicities combined for statistical power

Measuring Local Labor Market Import Exposure

1. Compute change in manufacturing import penetration <u>by industry</u> j (397 industries)

$$\Delta IP_{j,\tau} = \frac{\Delta M_{j,\tau}^{ch,us}}{Y_{j,91} + M_{j,91} - X_{j,91}},$$

where $\tau \in \{1991 - 2000; 2000 - 2014\}$

2. Compute change in import penetration <u>by Commuting Zone</u> (CZ) i based on i's initial industry employment mix across industries j

$$\Delta IP_{i,\tau} = \sum_j \frac{L_{ij,90}}{L_{i,90}} \Delta IP_{j,\tau}$$

Instrumental Variables Strategy

Source of endogeneity

- US imports from China not only affected by Chinese productivity growth and falling trade costs, but also by US demand shocks

Instrumental variables approach

- Instrument for US imports from China using other developed countries, imports from China (and lags of all other variables)

$$\Delta IP_{j,\tau}^{oth} = \frac{\Delta M_{j,\tau}^{ch,oth}}{Y_{j,88} + M_{j,88} - X_{j,88}}, \ \Delta IP_{i,\tau}^{oth} = \sum_j \frac{L_{ij,80}}{L_{i,80}} \Delta IP_{j,\tau}^{oth}$$

Variation in industry-level trade shocks has well-specified origin

- $\Delta's$ in China productivity and market access, causing Chinese exports to many countries to surge simultaneously
- As per Goldsmith-Pinkham et al. '17, use fixed weights for industry shares, test for pre-trends
- We are thinking of this as Bartik in the spirit of Borusyak et al. '18: 'treatment' is the trade shock not the industry structure per se

Geographic Dispersion of Exposure to Chinese Import Competition

Most-affected areas of the U.S.

Colors show which areas were most affected by China's rise, based on the increase in Chinese imports per worker in each area from 1990 to 2007. Hovering over each area on the map will show a demographic breakdown of that area, below, and its most-affected industries, at right.

Most-affected 20% Second-highest 20% Middle 20% Second-lowest 20% Least-affected 20%
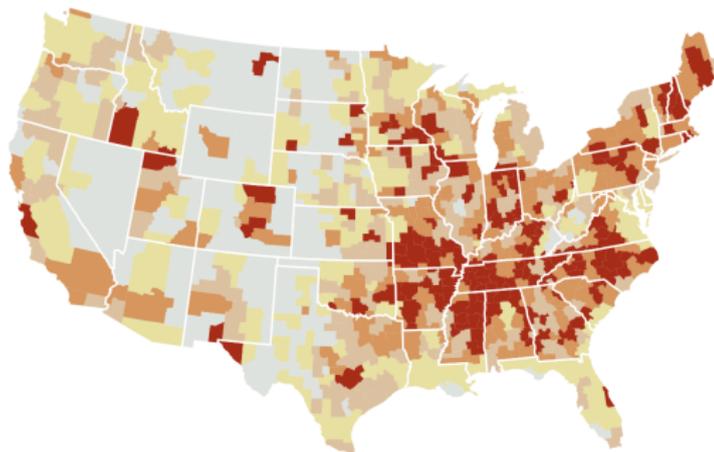
Most-affected industries

Most-affected industries, based on number of areas*	Impact per worker†
Furniture and fixtures 196 areas	$44k
Games, toys, and children's vehicles 114 areas	$488k
Sporting and athletic goods 106 areas	$82k
Electronic components 87 areas	$65k
Plastics products 84 areas	$11k
Motor-vehicle parts and accessories 79 areas	$12k
Electronic computers 68 areas	$207k

Source: WSJ 2016, Autor, Dorn and Hanson 2013

Pooled (M+F) Trade Shocks: Employment-Weighted $\Delta's$ in CZ's Import Penetration per Decade ($\simeq$ % of CZ GDP)
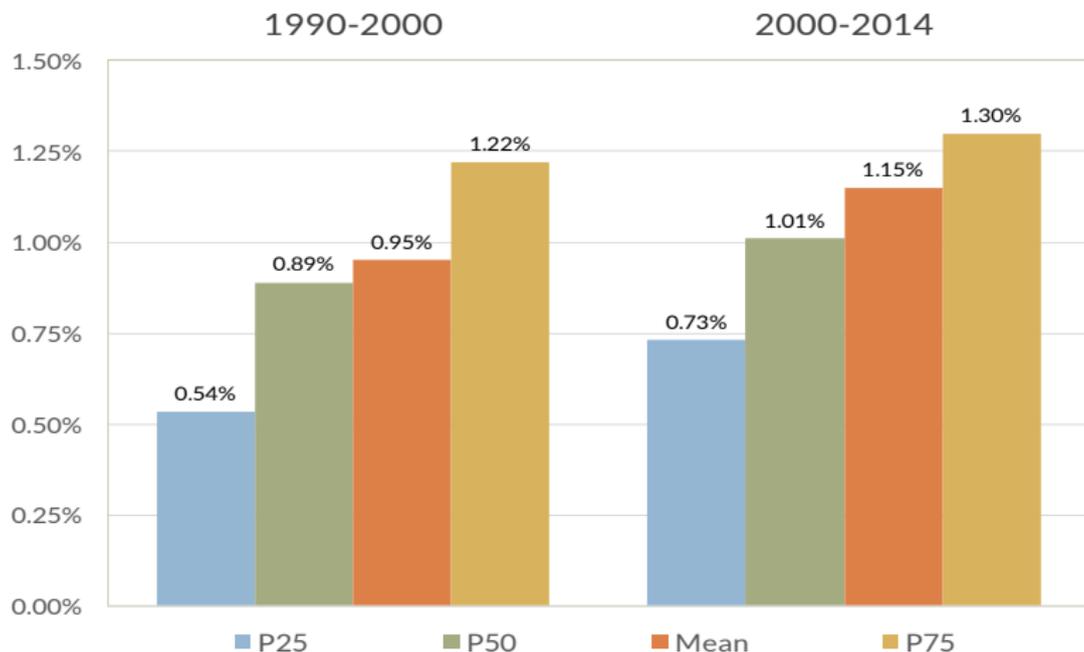
Accounting for Gender Differences

Gender-specific trade shocks

- Trade shocks differentially affect males or females depending on industries exposed

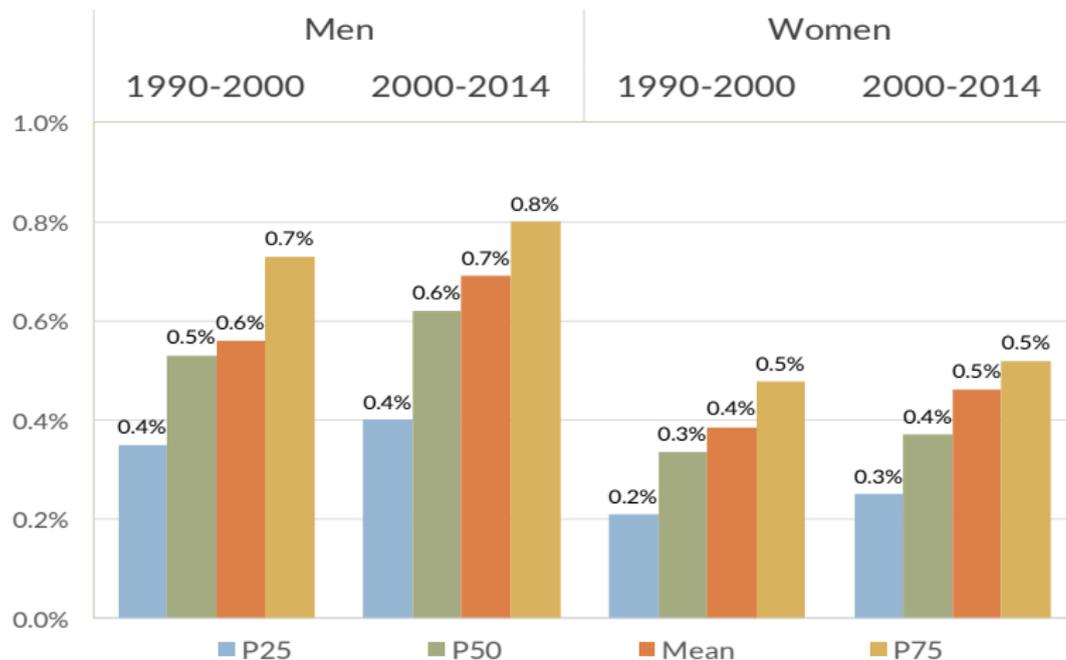**Instrumental variables approach**

- Multiply CZ-by-industry exposure measure by initial period male or female share of employment in each industry-CZ cell

$$\Delta IP_{i,\tau}^m = \sum_j \frac{m_{ij,90} L_{ij,90}}{L_{i,90}} \Delta IP_{j,\tau},$$

$$\Delta IP_{i,\tau}^f = \sum_j \frac{(1 - m_{ij,90}) L_{ij,90}}{L_{i,90}} \Delta IP_{j,\tau},$$

where $m_{ij,90}$ is the male employment share in industry j in CZ i in 1990

Employment-Weighted $\Delta's$ in CZ's Import Penetration per Decade by Sex

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Main Estimating Equations

Estimated by 2SLS

$$\Delta Y_{i,\tau} = \alpha_t + \beta_1 \Delta IP_{i,\tau} + \mathbf{X}_{i,t}'\delta + e_{it},$$

$$\Delta Y_{i,\tau} = \alpha_t' + \beta_1' \Delta IP_{i,\tau}^m + \beta_2' \Delta IP_{i,\tau}^f + \mathbf{X}_{i,t}'\delta' + e_{it}'$$

Control vector includes...

- Population shares in 5 race/ethnicity, 2 education, and 2 nativity groups
- Share of employment in manufacturing, 'routine-intensive' occupations, 'offshorable' occupations
- Female employment share
- Census division dummies

Other specification features

- Wage quantile estimates apply Chetverikov, Larsen, Palmer '16 grouped quantile IV estimator
- CZ's weighted by population, SEs clustered on states

OLS and 2SLS Estimates 1990 − 2014: Manufacturing Employment/Pop, Ages 18-39

Effect on Manufacturing Emp/Pop, Ages 18 - 39
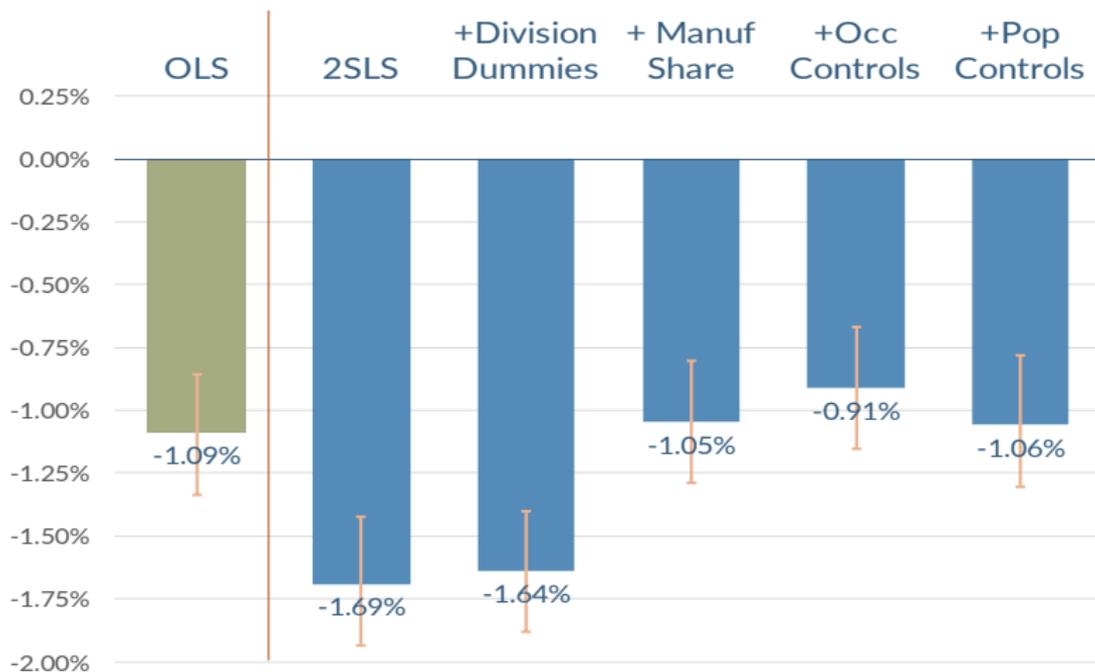
Reduced Form Test for Pre-Trends: 1970-80, 1980-90, 1990-00, 2000-14

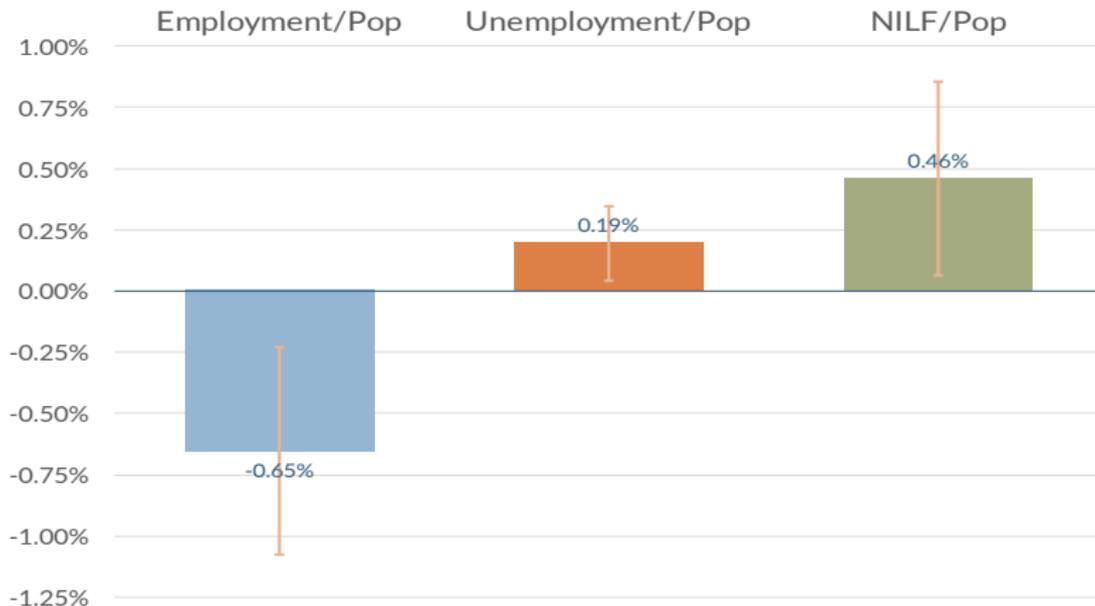**Effect on Manufacturing Emp/Pop, Ages 18 - 39**
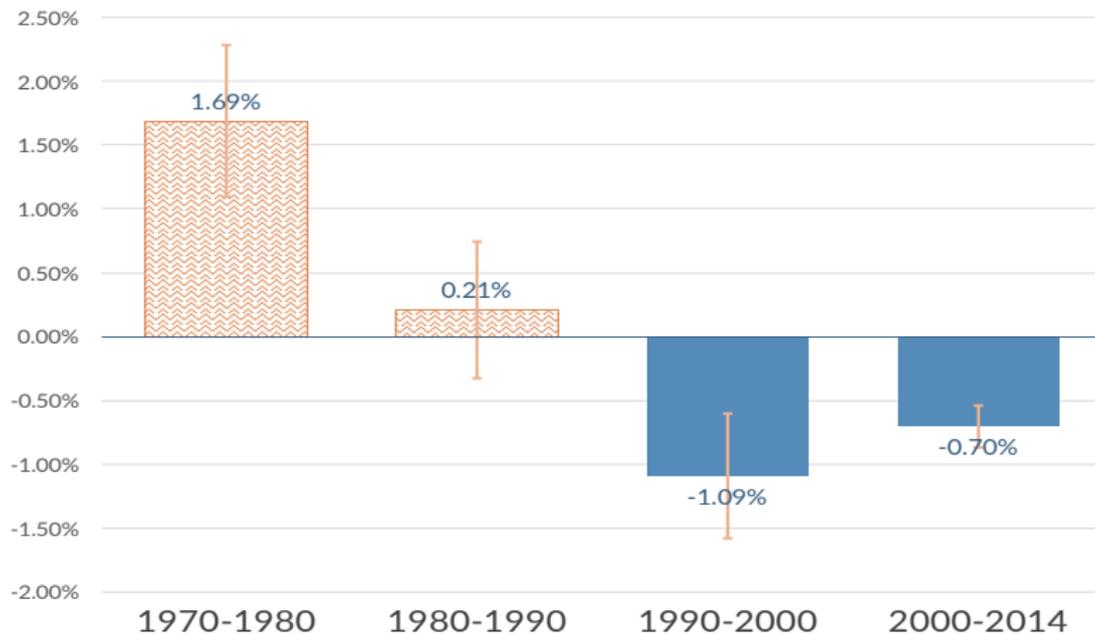
Effect of Manufacturing Shocks on Employment Status/Pop by Sex Ages 18-39, 1990-2014

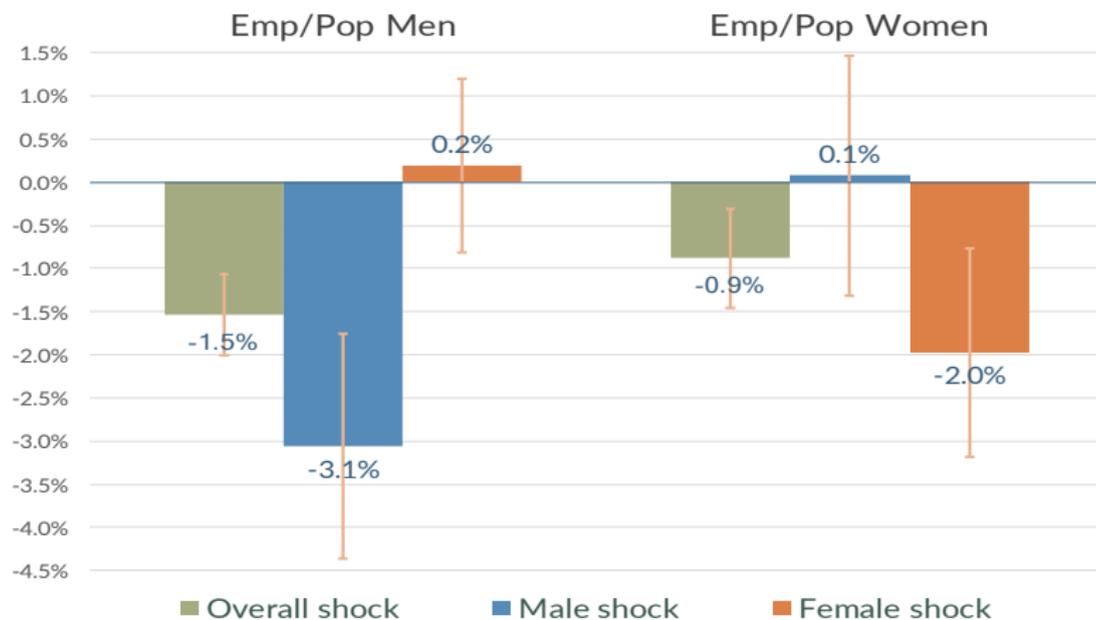**Effect of Gender Trade Shocks on LF Status by Sex, Ages 18 - 39**
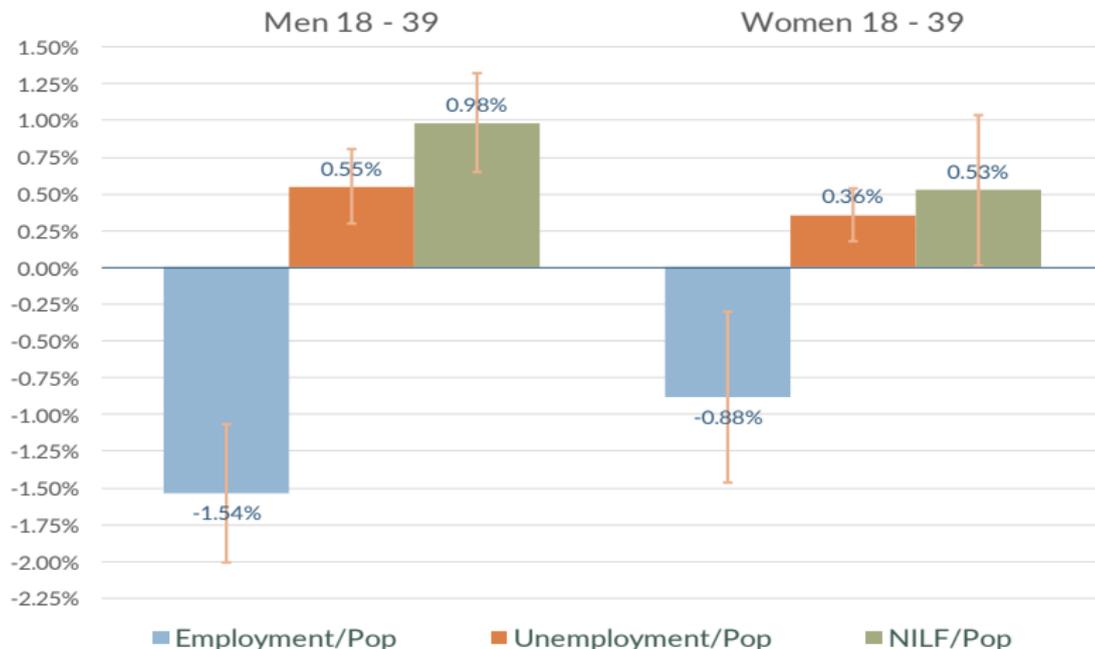
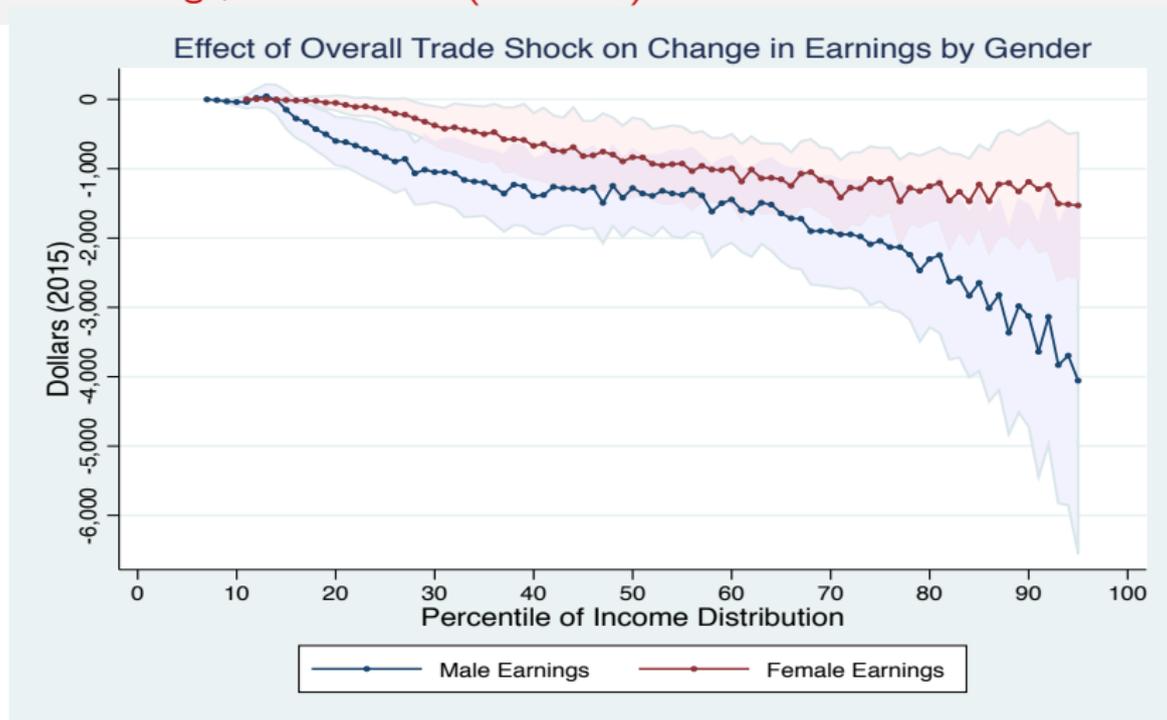# Effect of Manufacturing Shock on M-F Gap in Employment Status/Pop, 1990-2014

**Effect of Pooled Trade Shock on M-F Δ in LF Status, Ages 18 - 39**

Effect of Sex-Specific Shocks on Emp/Pop by Sex, 1990-2014

Effect of Pooled Manufacturing Shock on CZ-Level Male and Female Annual Earnings, 1990 - 2014 (in 2015$)

Effect of Overall Trade Shock on Change in Earnings by Gender

Effect of Manufacturing Shock on CZ-Level Male-Female Annual Earnings Gap as a Pct of Male Earnings in 1990
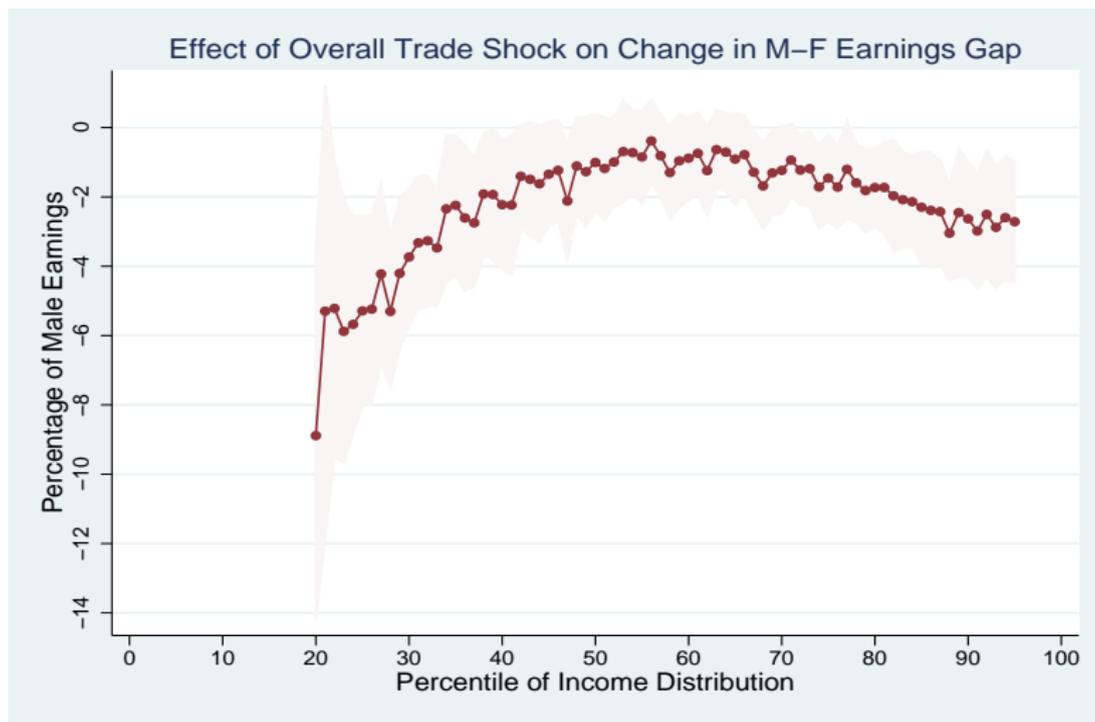
Effect of Overall Trade Shock on Change in M–F Earnings Gap

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What Do Non-Employed Young Adults Do?

Employment opportunities, educational investments, and idleness

- Trade booms and busts: Atkin '16; Greenland, Lopresti '16
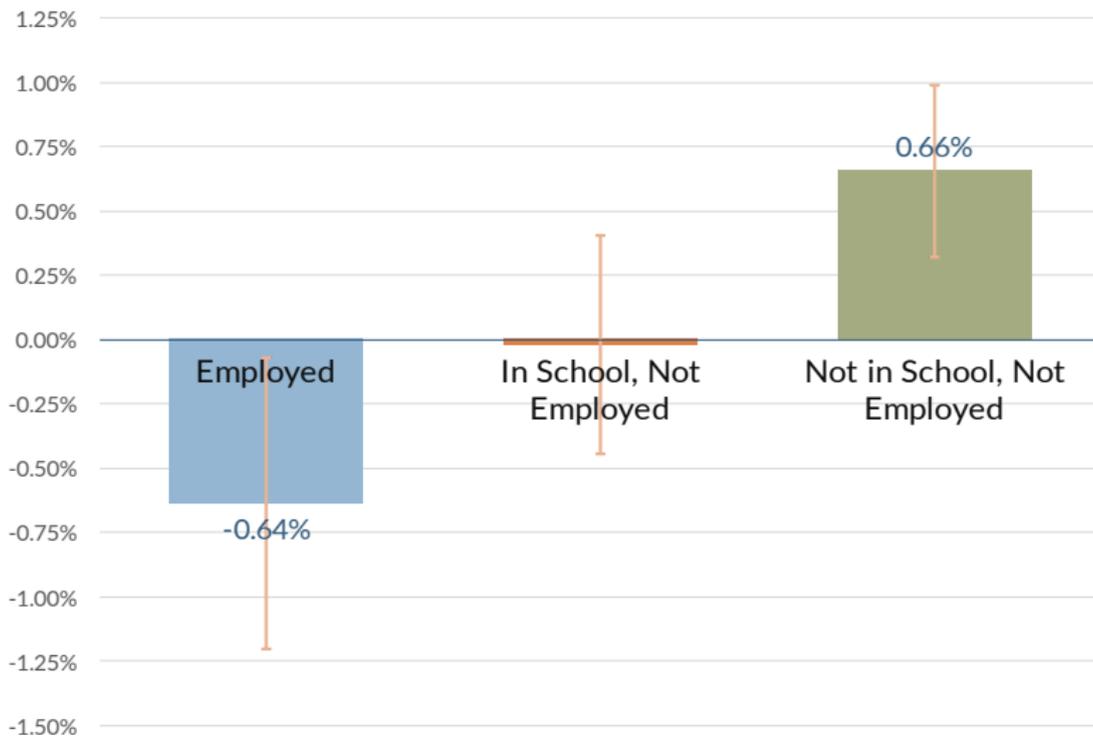- Housing booms and busts: Charles, Hurst, Notowidigdo '18; Aparicio Fenoll '16

Growing demand for leisure

- Young men increasingly devote time to video games: Aguiar, Bils, Charles, Hurst '16

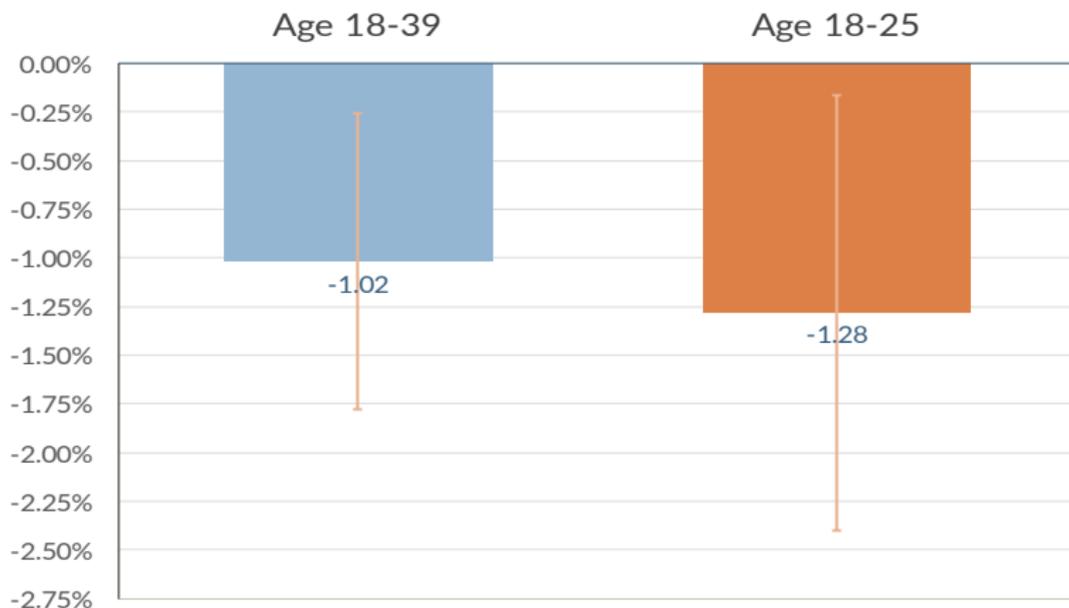# Focusing on *Young* Adults 18-25, a Sharp Rise in Male 'Idleness' in Trade-Exposed CZs
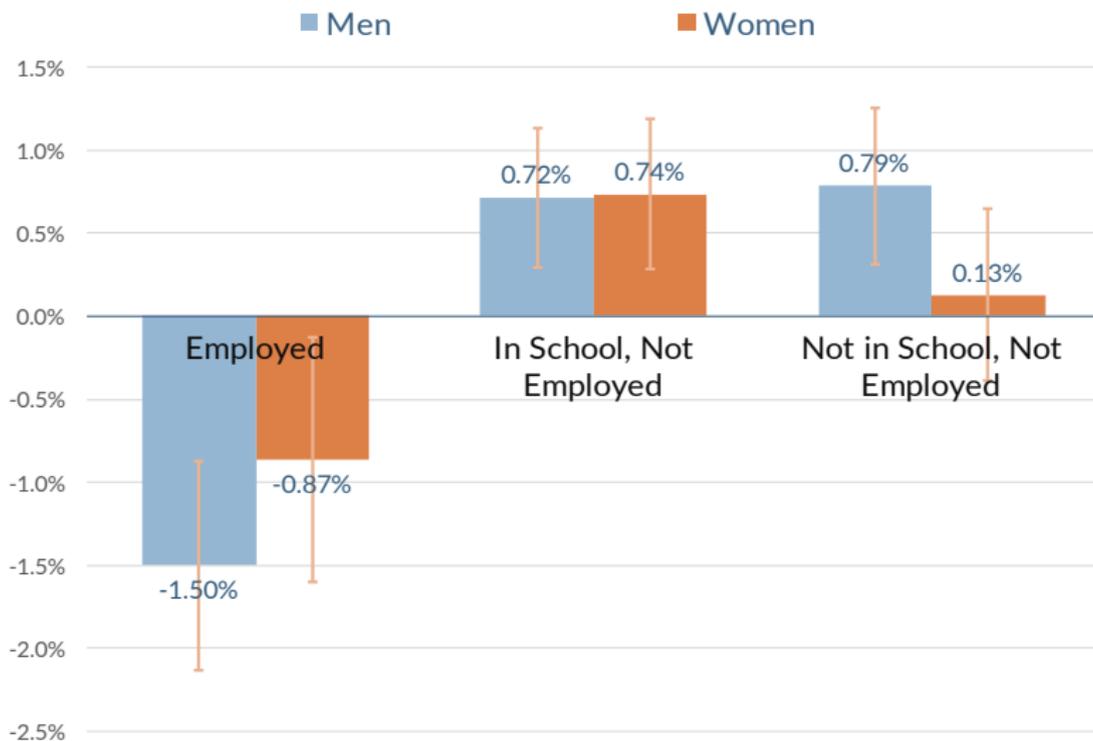
Effect of Manufacturing Shock on 'Idleness' Gap Among Young Adults 18-25: Males - Females

Effect of Manufacturing Shock on Ratio of Males/Females Ages 18 - 25/39, 1990-2014

Effect of Trade Shocks on M/F Gender Ratio in CZ, Ages 18 - 25/39

Why Does the M/F Ratio Fall in Trade-Exposed CZs?

1. **Differential male migration**
   - Bartik '17 finds small negative overall pop inflow response, no outflow response
   - No evidence on gender-specific migration patterns

2. **Military enlistment**
   - Using Army records: sharp rise in enlistments of young, unmarried men
   - Can explain about 10% of M/F decline

3. **Incarceration**
   - Deiana '15, Feler-Senses '15: increase in property crime
   - Difficult to translate into population effects w/o incarceration data

4. **Mortality**
   - Case & Deaton '15,'16: Rise in mortality among middle-age, non-Hispanic whites 1998-2015. See also Pierce-Schott '17
   - *We focus on young adults 20-39, by sex and cause*

Effect of Manufacturing Shock on Cumulative Decadal Male-Female Mortality Differential per 100K Adults Ages 20-39, 1990–2015
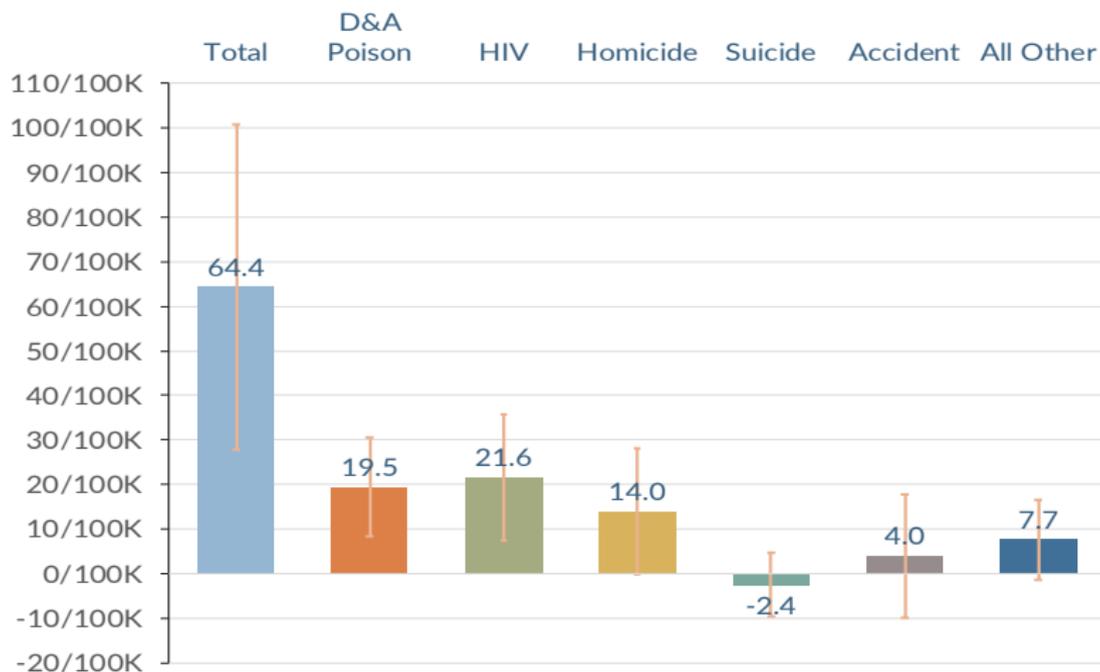
Mean decadal mortality among ages 20-39 over 1990-2015:
Men 1,645/100K, Women 709/100K, M-F gap 936/100K

Effects of Sex-Specific Shocks on <u>Male</u> Mortality per 100K Ages 20-39
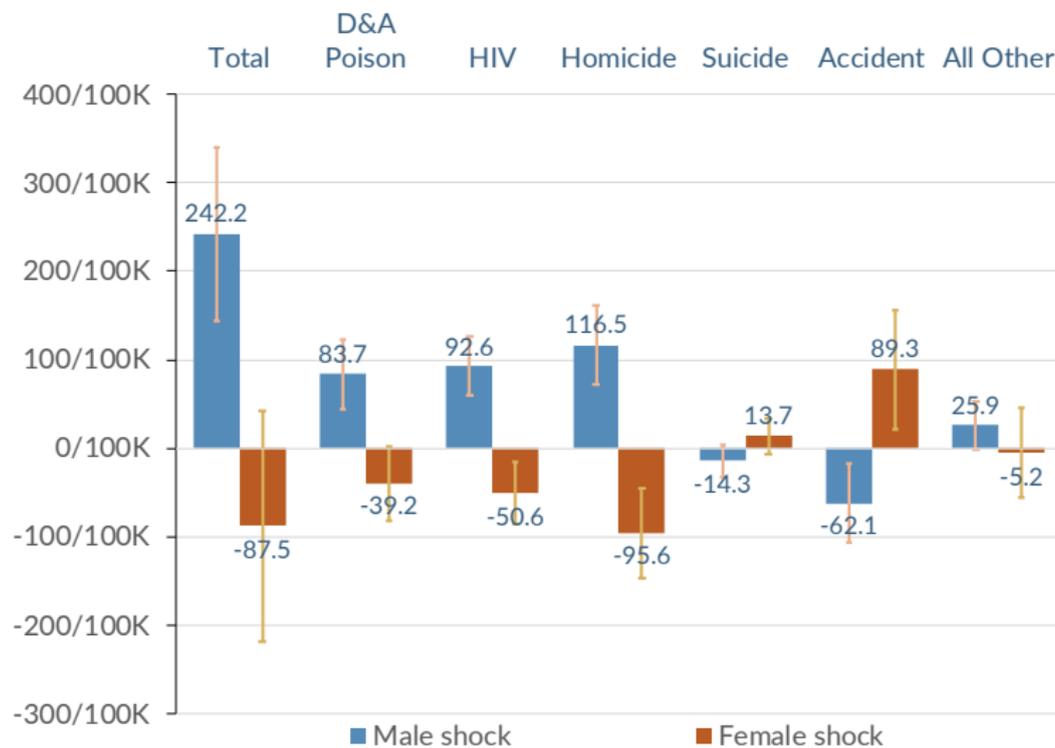
Mean male decadal mortality ages 20-39, 1990-2015: 1,645/100K

Effects of Sex-Specific Shocks on <u>Female</u> Mortality per 100K Ages 20-39
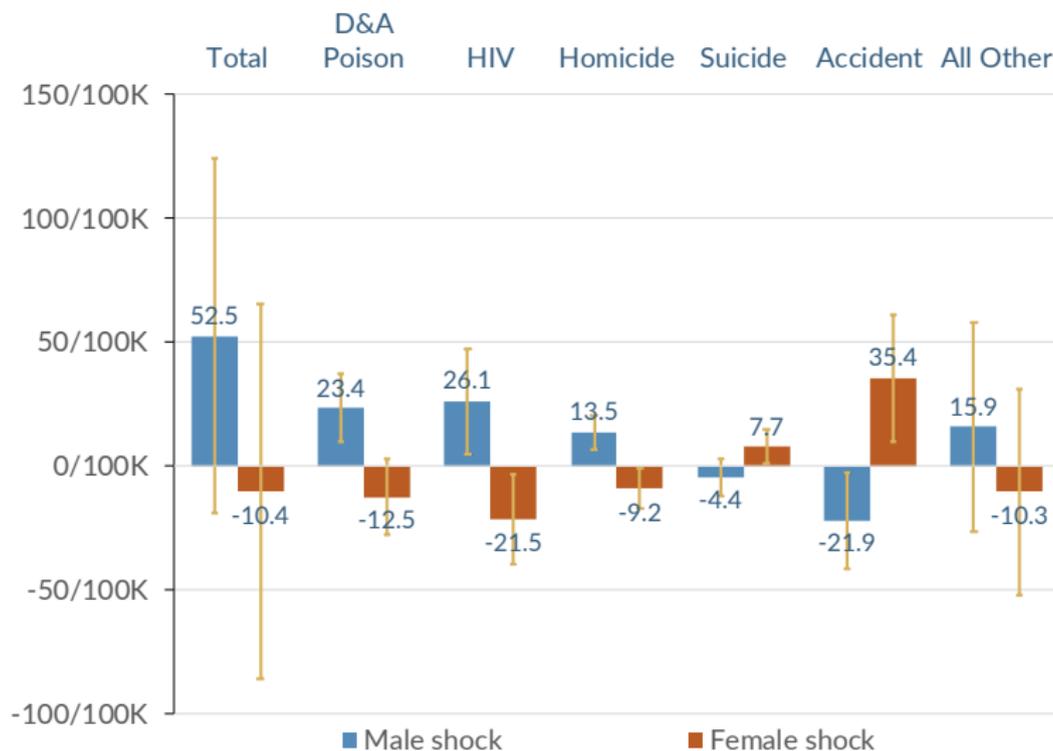
Mean female decadal mortality ages 20-39, 1990-2015: 709/100K

Summary of Outcomes at Individual (not Family) Level for Young Adults

At the CZ level, trade shocks...

1. **Differentially reduce male employment**

2. **Differentially reduce male earnings, esp. below the median of the annual earnings distribution**

3. **Raise 'idleness' among young men but not young women**

4. **Reduce the ratio of young adult men to young adult women**

5. **Induce differential rise in male mortality from D&A, HIV, Homicide**

6. **Induce rise in local crime (mostly committed by young men), Feler & Senses '17**

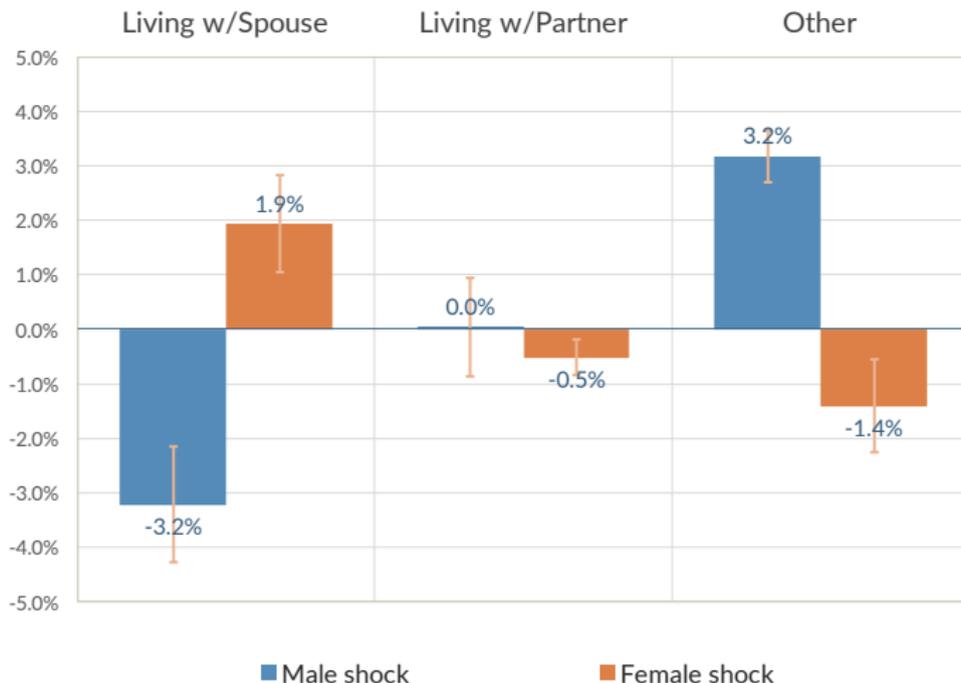**Young men faring differentially poorly in trade-impacted CZs**

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Effect of Manufacturing Shock on Marital Status, Women Ages 18 – 39, 1990-2014

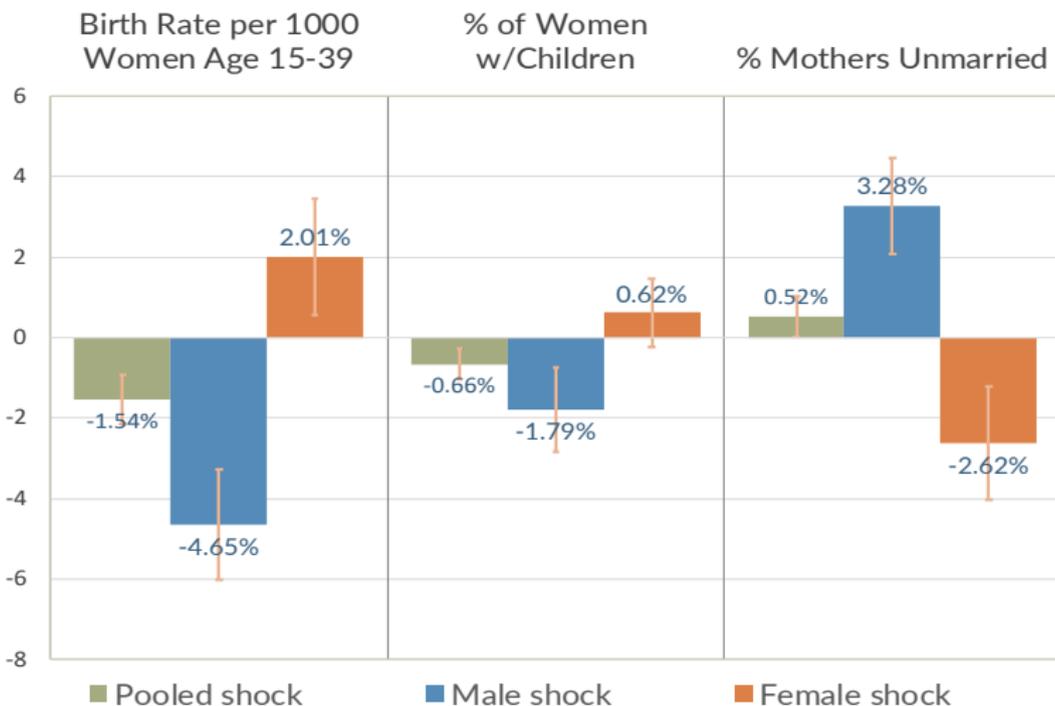**Effect on Marital Status, HH Structure, Women Ages 18 - 39**
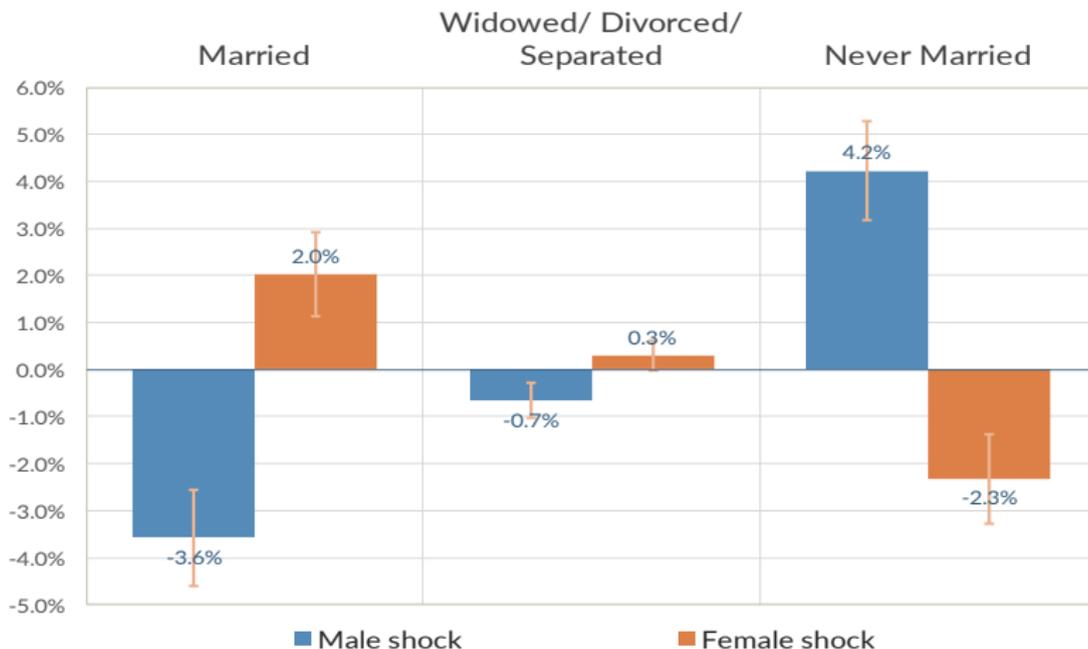
Effect of Manufacturing Shock by Sex on Cohabitation of Women Ages 18 – 39, 1990-2014

Agenda

Effect of Manufacturing Shock on Fertility among Women Ages 15-39, 1990-2014

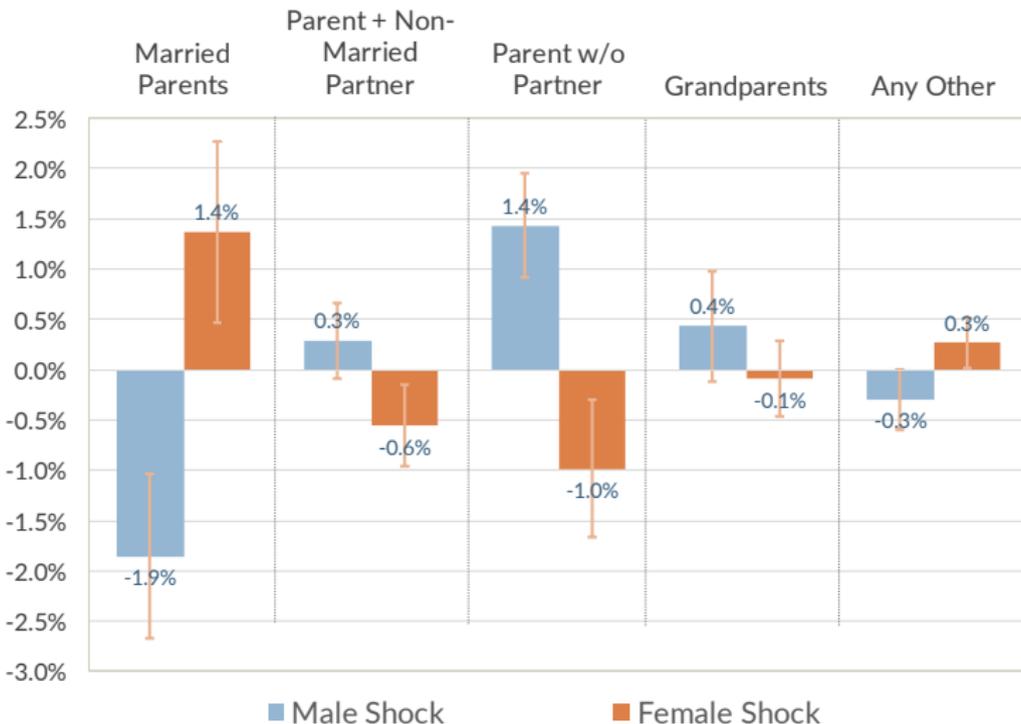# Shocks to Manufacturing Shift Composition of Children's HH Living Arrangements

Fraction of Children <18 Living in Different HH Arrangements
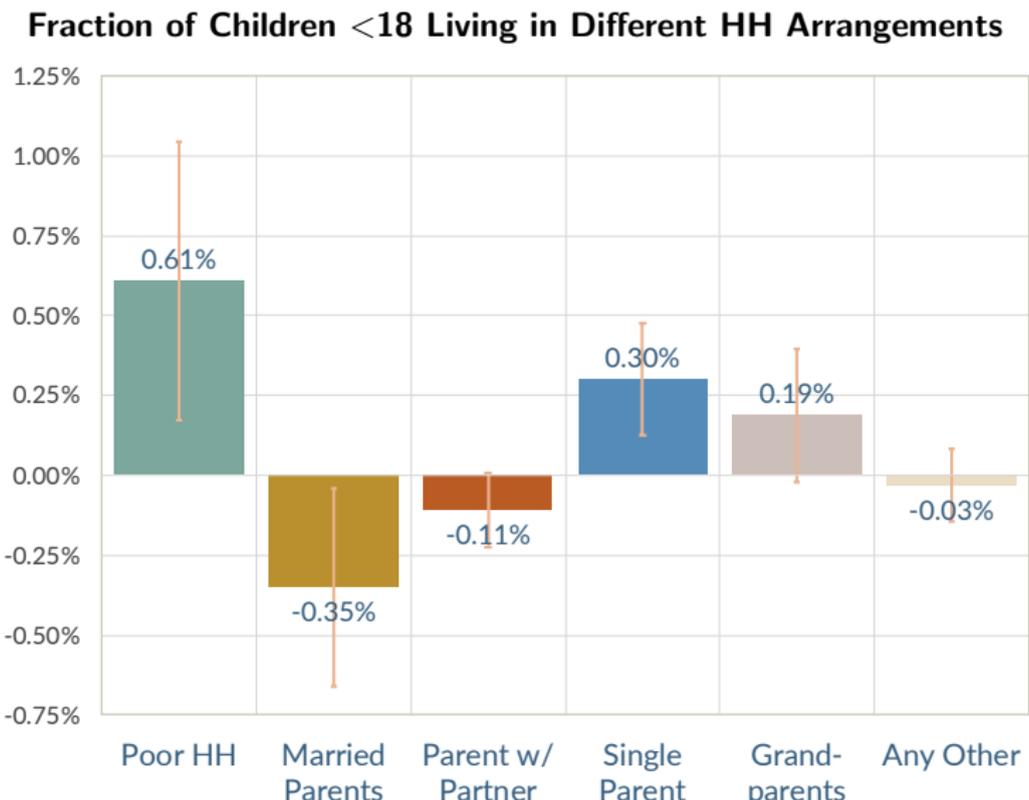
Shocks to Manufacturing Raise Childhood Poverty

**Fraction of Children <18 Living in Poverty: Overall and by HH Arrangement**
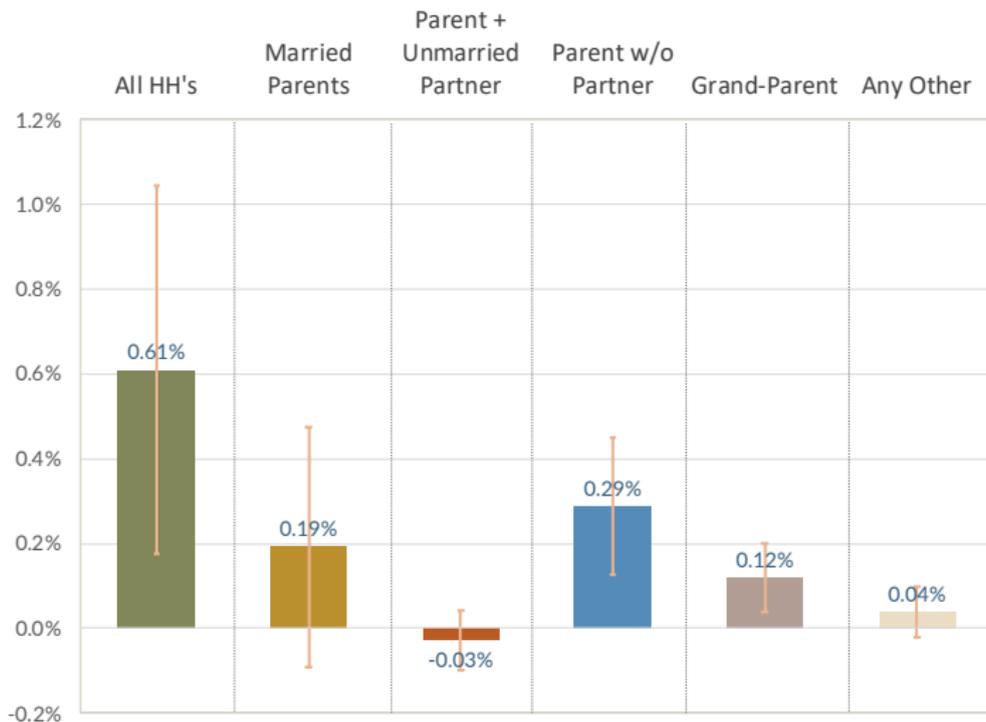
Shocks to Male vs. Female Earnings Have Countervailing Effects on Children's HH Living Arrangements

Fraction of Children <18 Living in Different HH Arrangements

Shocks to Male Earnings Raise Childhood Poverty by Raising Lone Parenting; Shocks to Female Earnings Reduce Lone Parenting

Fraction of Children <18 Living in Poverty: Overall and by HH Arrangement
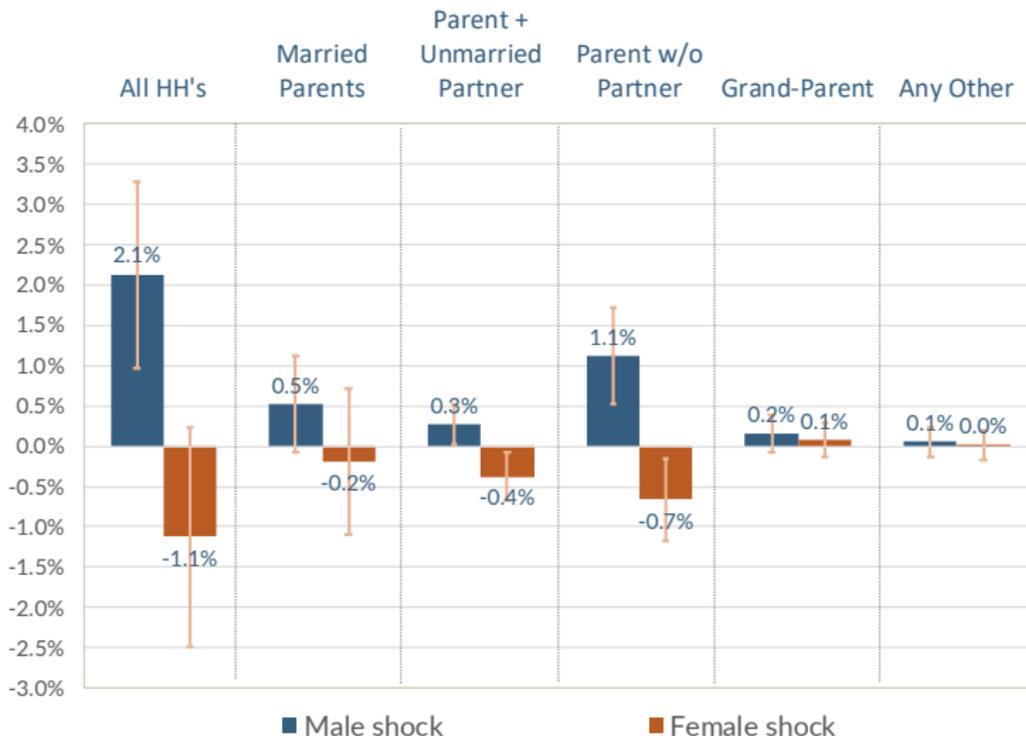
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When Work Disappears: Worse than Becker Would Have Predicted?

1. **China Shock to U.S. manufacturing in 1990s and 2000s**
   - Sharp contraction in manufacturing employment without precedent in U.S. post-war history
   - Esp. consequential for males because
     - Men overrepresented in manufacturing
     - Young non-college men had relatively high wages+hours in manufacturing
   - Shocks lowered relative employment and earnings of young men, esp. in lower quartile of earnings distribution

2. **Broader consequences for young male economic (dys)function**
   - Rise in male idleness
   - Reduced male/female presence in non-institutional population
   - Differential rise in male mortality (not exclusively deaths of despair)

3. **Understanding Becker + Wilson**
   - Reduced marriage rates and cohabitation
   - Fall in fertility, yet rise in single motherhood
   - Sharp rise in children in poverty, partly due to fall in two-parent HH's
   - Becker didn't write about fertility and single-parenting, but...
   - Male dysfunction offers a Becker-Wilson link, rationalizes broader consequences