

# Was the Arsenal of Democracy an Engine of Mobility? Public Investment and the Roots of Mid-century Manufacturing Opportunity

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<sup>1</sup>Any views expressed on statistical, methodological, technical, or operational issues are those of the author and not necessarily those of the US Census Bureau. Results disclosed under DRBs #CBDRB-FY20-037 and #CBDRB-FY20-131.

# Was Manufacturing Opportunity a Legacy of WWII?

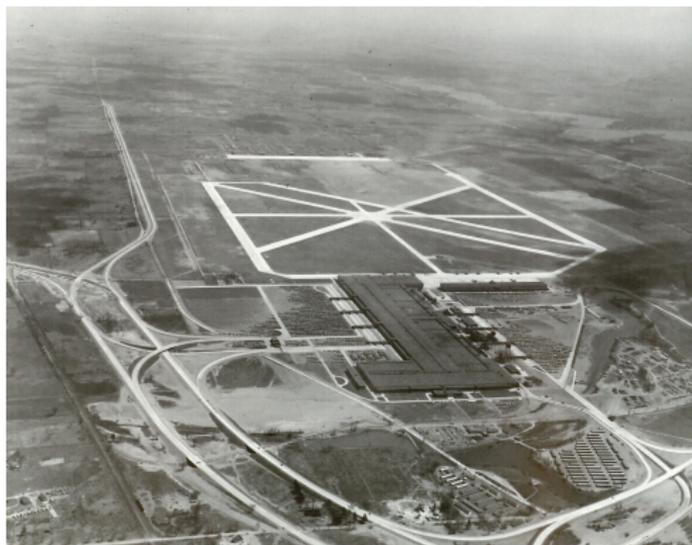
- **Motivation:** Decline in “good-paying” blue collar jobs + economic opportunity in many regions since 1950s
  - Potential role for place-based/industrial policy? (Kline and Moretti, 2014b; Austin et al., 2018; Bartik, 2019; Lane, 2020; Slattery and Zidar, 2020)
- **Question:** What role did WWII government interventions play in creating places with mid-century manufacturing opportunity + upward mobility?
- **This paper:** Study government-financed construction of large new manufacturing plants built for the war
  - How did siting affect local development + manuf work opportunity?
  - Were plants boons to *individuals* living in region before war?
- **Related literature:** **Effects of WWII on postwar economy** (Goldin and Margo, 1992; Fishback and Cullen, 2013; Jaworski, 2017; Brunet, 2018; Bianchi and Giorelli, 2019; Gross and Sampat, 2020); **agglomeration, path dependence, and persistence** (Davis and Weinstein, 2002; Greenstone et al., 2010; Ellison et al., 2010; Bleakley and Lin, 2012; Nunn, 2014; Hanlon, 2017; Feigenbaum et al., 2018); **place-based and industrial policy** (Murphy et al., 1989; Kline and Moretti, 2014a,b; Fan and Zou, 2018; Lu et al., 2019; Bartik, 2019; Lane, 2020); **place and intergenerational mobility** (Wilson, 1997; Black and Devereux, 2011; Chetty et al., 2016; Chetty and Hendren, 2018a,b)

# Government-Financed Plant Construction in World War II

- Industrial mobilization for WWII: Manufacturing output *triples* 1939 - 1942
  - Expansion required entirely new plants
- Military required large new facilities to be built in secure locations away from major manufacturing hubs (vulnerable to blackout, attack, and congestion)
  - But proximate to basic resources (labor, water, electricity)
- **Problem:** Often no firm willing to invest in such locations
- **Result:** Government paid for plants in locations where firms wouldn't invest

*"[I]ndustrialists' reluctance to invest in dispersed plant facilities was at odds with the government's hope that private capital could finance new inland construction; hence, the war department could carry out its policy only to the extent that the government was willing to put up the money" - US Air Force Historical Division*

# Identification Strategy



Willow Run Bomber Plant, Ypsilanti

- Among suitable secure locations, siting of government-funded plants was driven by short-run war concerns
  - In the absence of the war, **neither** counties where plants were built, **nor** similarly-suitable sites would have received plants

# Empirical Implementation

## Data:

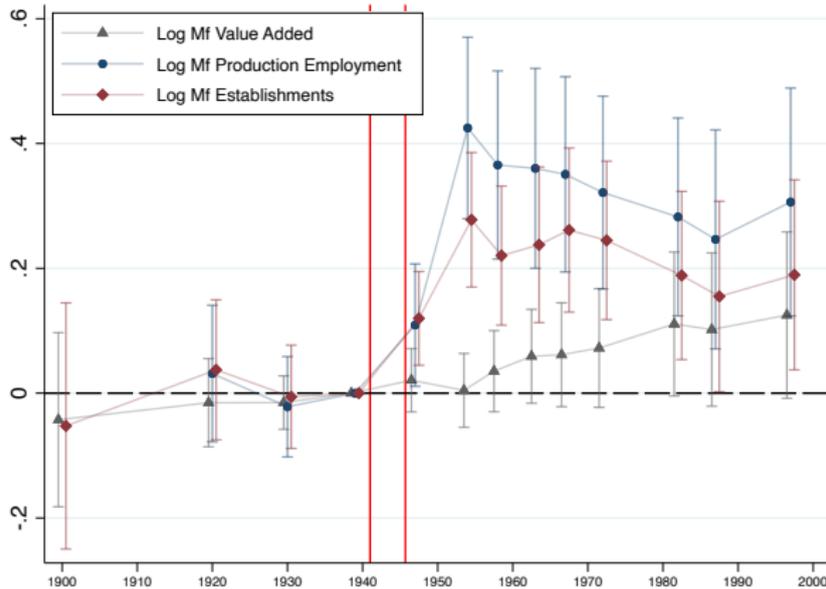
- Newly digitized plant-level investment data from War Production Board
- County-level panel data from Haines/NHGIS/County Data books
- New data on 1970 income rank by 1940 parent earnings rank + location from Massey and Rothbaum (2020) link of 1940 Census and IRS 1040 returns
  - Analogous to regional mobility data from Chetty et al. (2014)
- (Not discussed today: micro-level Social Security data on personal earnings 1978-2016 linked to place of birth and post-1990 CPS ASEC)

## Approach:

- Estimate propensity score for siting using 1940 characteristics relevant to wartime siting concerns (access to electricity, water, labor, and basic infrastructure, geography relevant to security)
- Re-weight comparison counties to look like treatment (ATET weights), focus on overlap sample
- Other attributes (income, housing values) are very well balanced

# Persistent Increase In Manufacturing Jobs

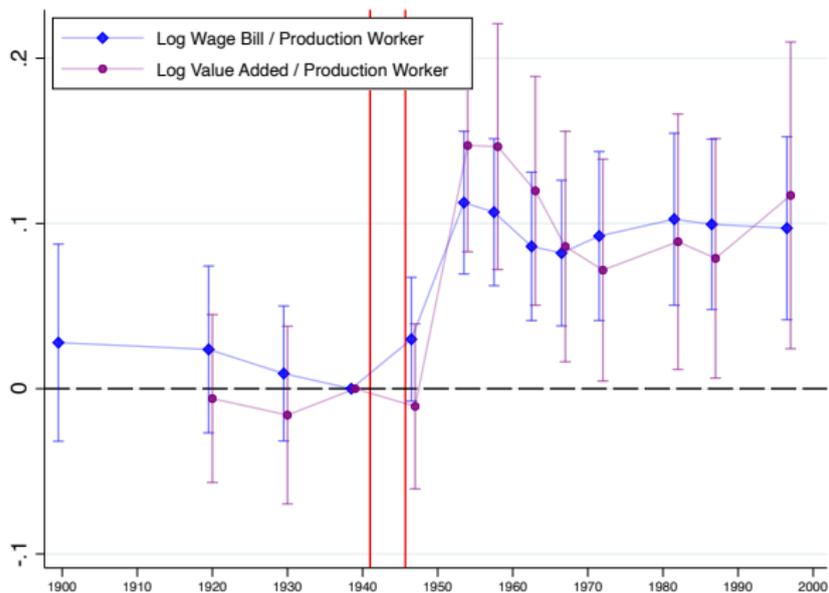
## Re-Weighting ATET Estimates, Differenced Outcomes



- Large, persistent effect on manufacturing output + employment in county
- No short-run increase in # establishments

# Permanent Boost to Productivity and Pay

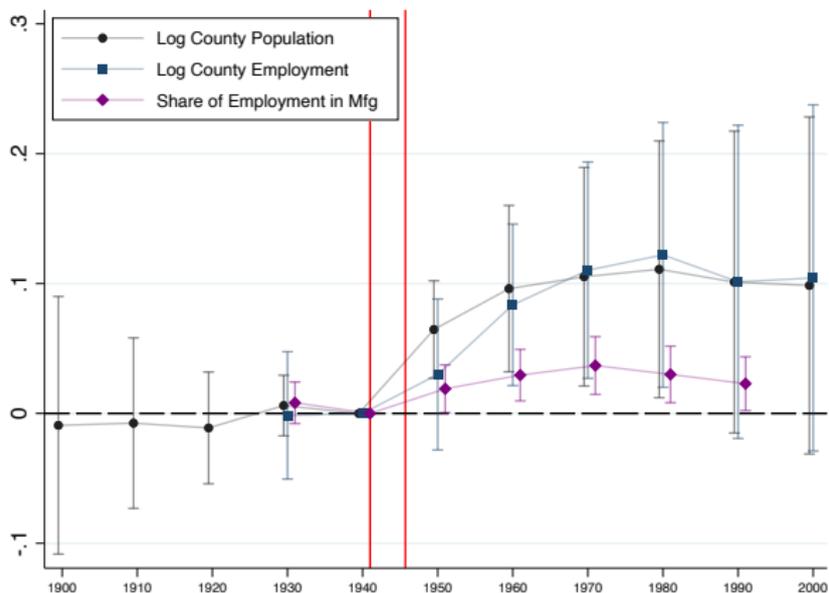
## Re-Weighting ATET Estimates, Differenced Outcomes



- Permanent increase in wage bill per worker
- Closely matches output per worker

# Permanent Increase in Region Size

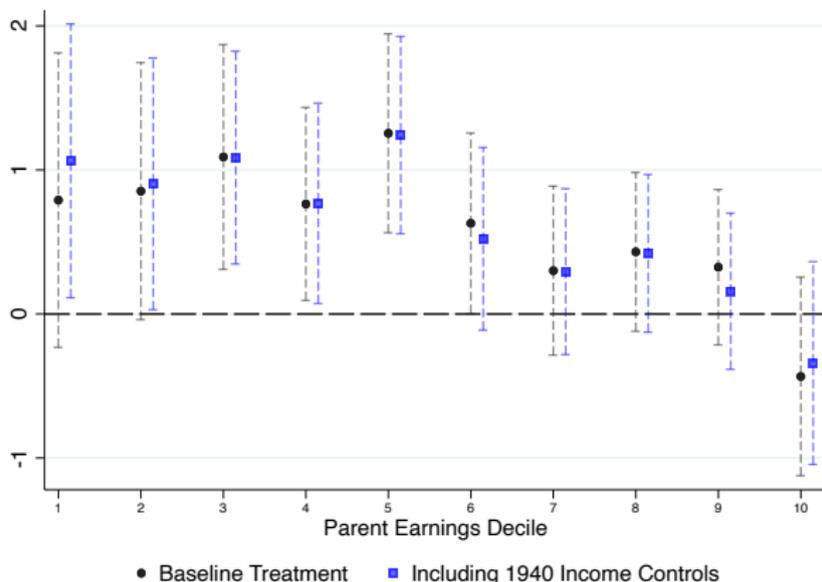
## Re-Weighting ATET Estimates, Differenced Outcomes



- Employment goes beyond manufacturing (retail, services, etc)
- Median incomes of 1970s/1980s residents are 4% higher

# Increased Upward Mobility

Outcome: 1975-1979 Tax Unit AGI Rank



- For bottom half, plant is equivalent to having parents 4 percentiles higher
- Only find personal earnings rise for white men

# Role of Cold War Spending? Two Kinds of Plants



## Ordnance Plant

Only useful for defense

Post-war mfg driven by defense \$\$

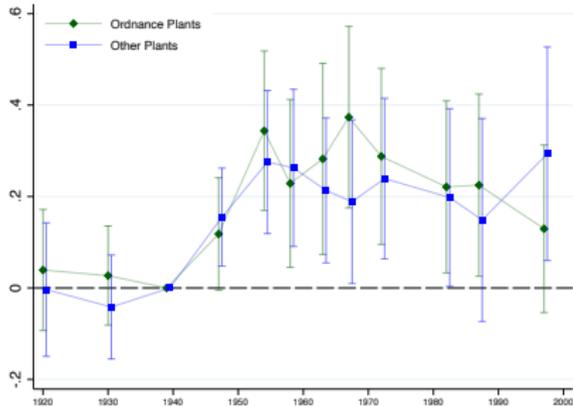


## General Mfg Plant

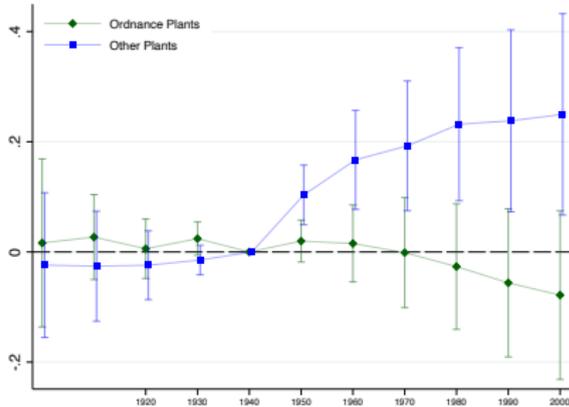
Similar to civilian mfg plants

Post-war mfg not driven by defense \$\$

# Large Effects Even Without Postwar Military \$



Log Mfg Production Employment

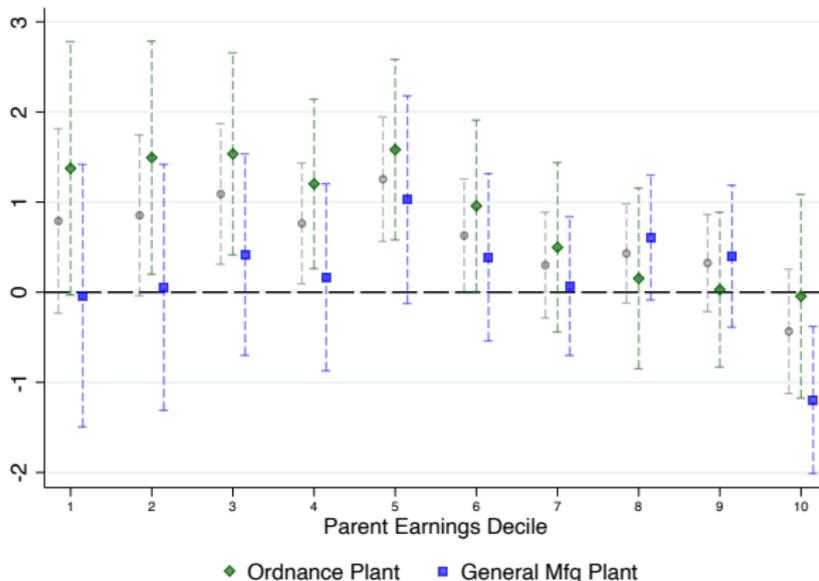


Log Population

- Only find growth effects for plants that *could be converted* away from defense

# Effects by Plant Type (ATET)

1975-1979 AGI Rank, Men



- Only find effects on mobility in places with *defense-oriented* plants
- Plants with largest growth effects not plants with largest benefits for residents

# Thanks!

- I hope this was riveting!



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