

# Is manufacturing destiny for Midwest industrial cities?

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Industrial Cities Initiative Meeting



[www.chicagofed.org/midwest](http://www.chicagofed.org/midwest)

# MW Industrial Cities Statistical Overview

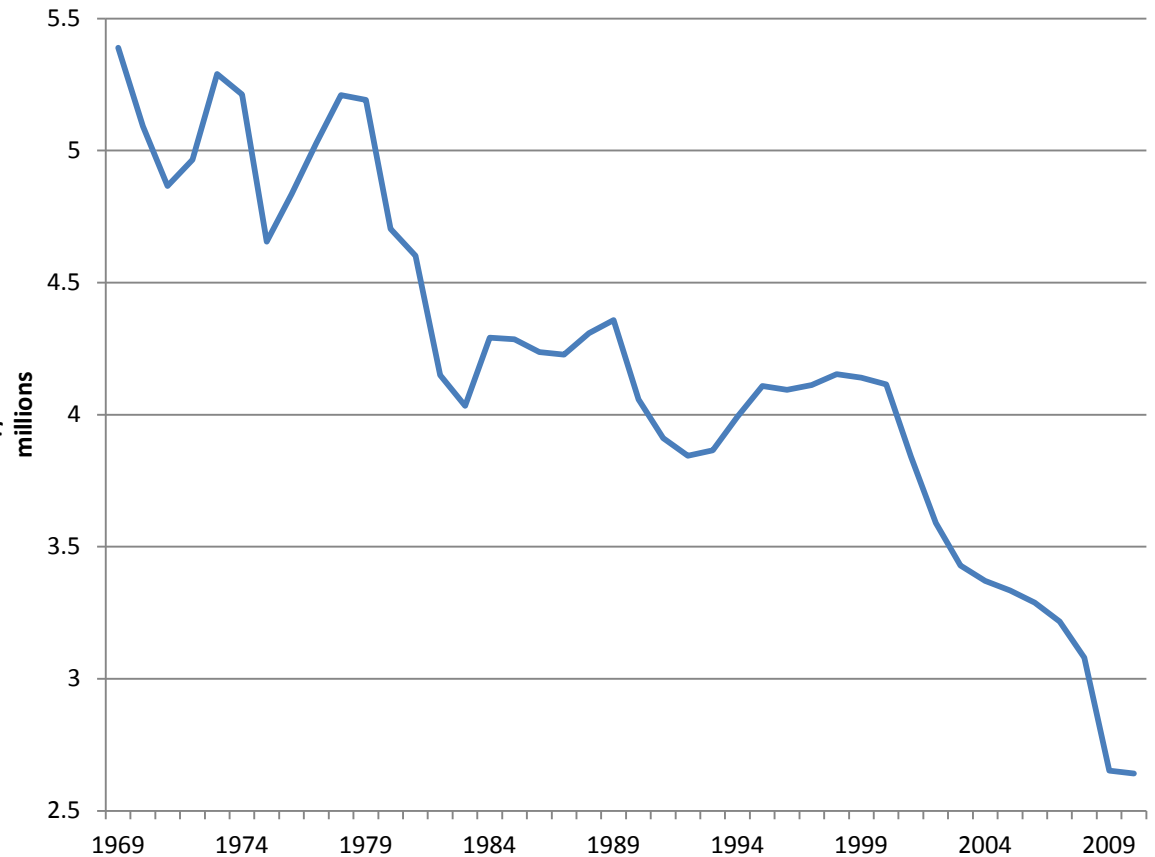
- Experience of Industrial Cities (statistical overview) and Recovery Patterns
- Are industrial cities different?
  - How much can be explained by mfg. history?
  - Can MW Industrial Cities determine their own fate?

# Absolute and sharp declines in employment

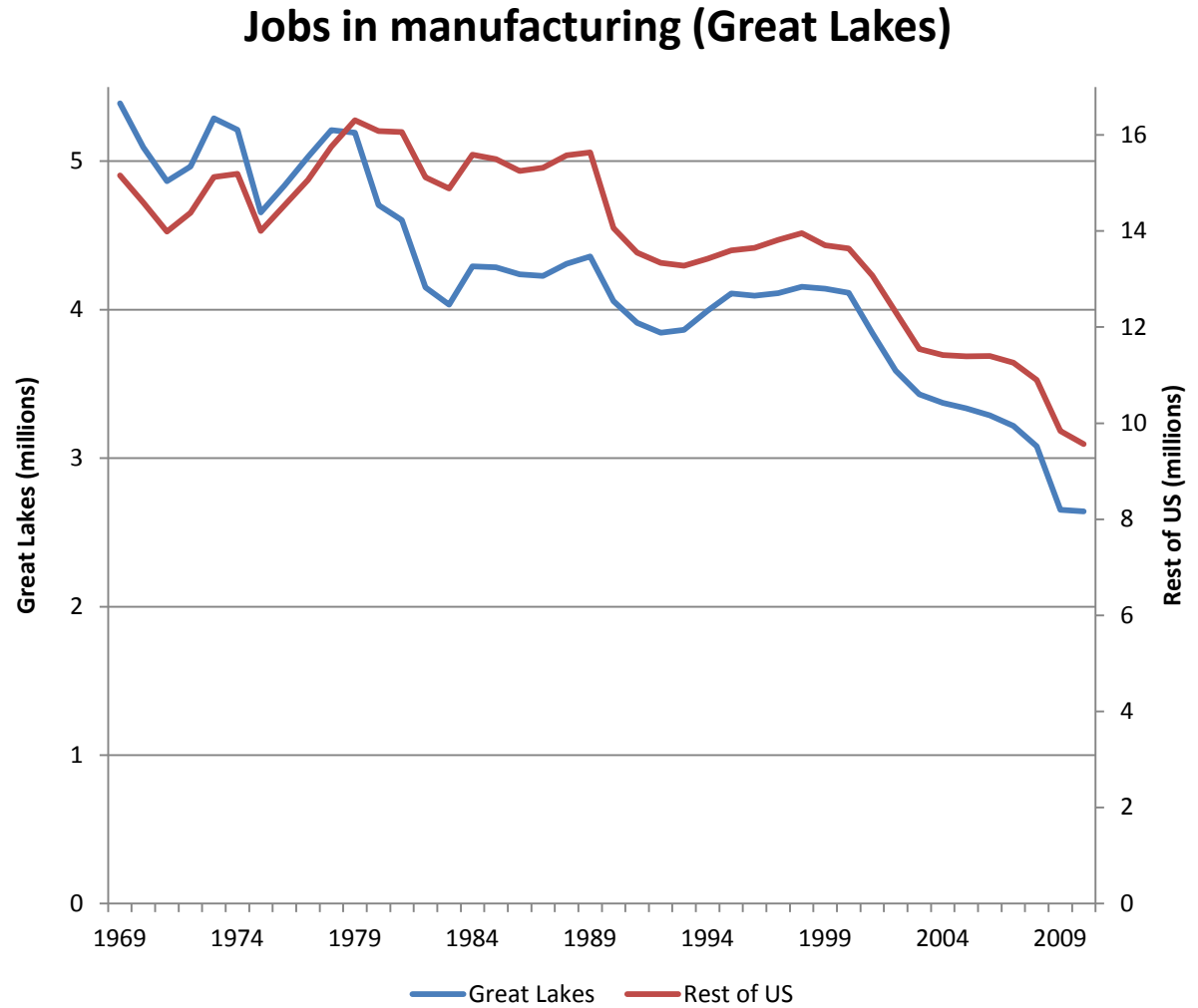
-- Jobs are down by one-half since 1969.

-- Decline has been profound, but not relentless. Decline comes in shock waves, such as the auto-steel decline of 1979-83, and the longer-lived wave of decline since the late 1990s.

**Jobs in manufacturing 1969-2010 (Great Lakes)**



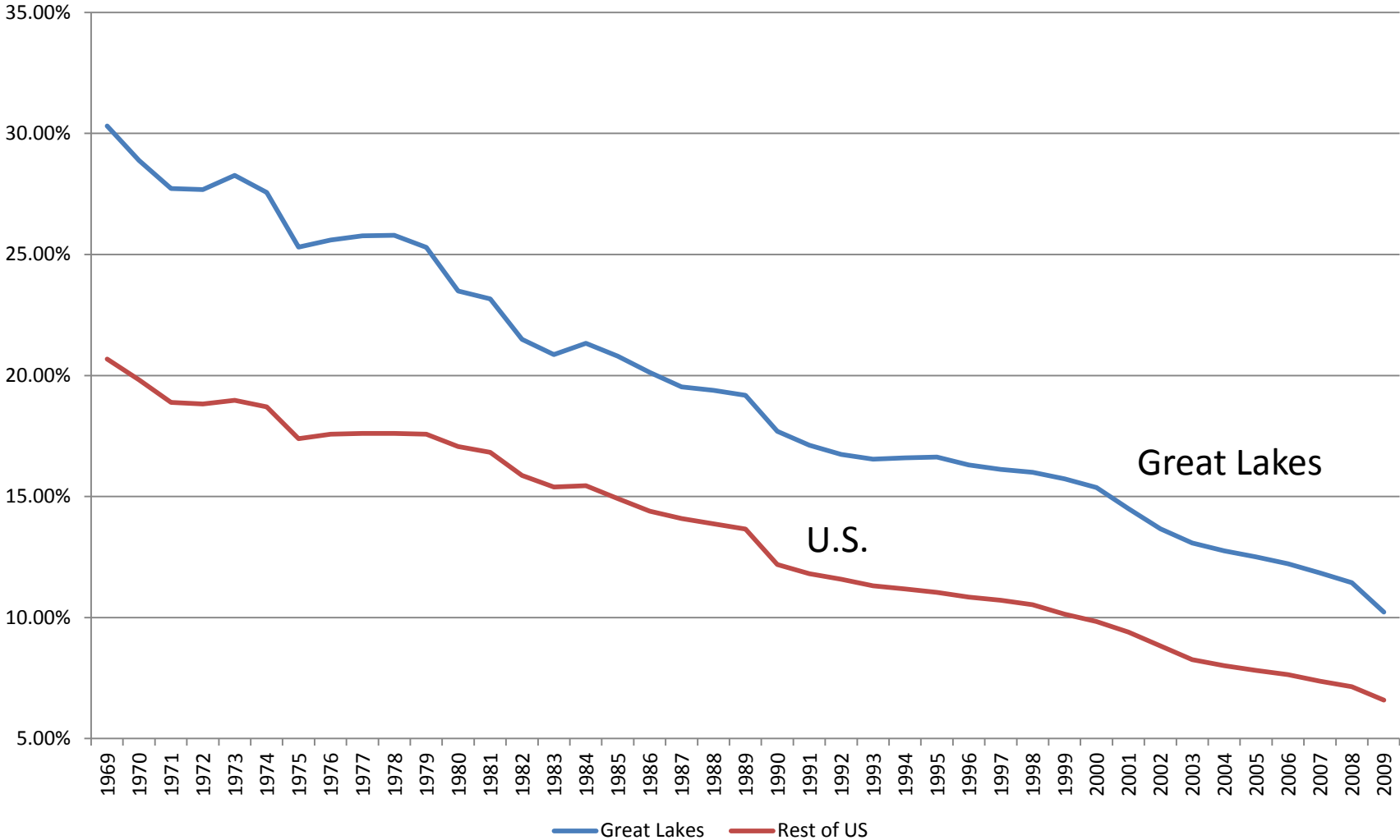
**Since 1990,  
GL experience  
not much  
different from  
rest of U.S.,  
on average—  
the 1990s a  
little better,  
and since  
then a little  
worse**



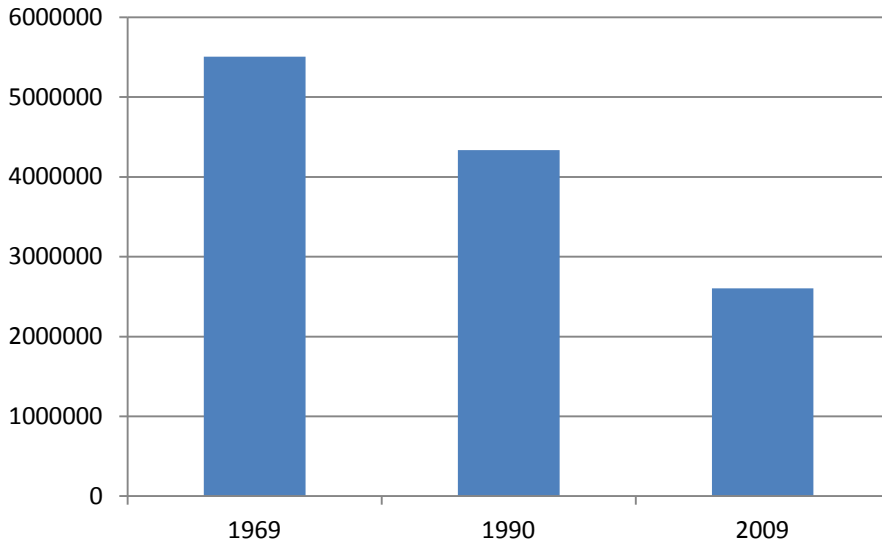
# The Great Lakes (Midwest) region continues to be oriented toward manufacturing

Share of total jobs in mfg.

Percent jobs in manufacturing (Great Lakes)



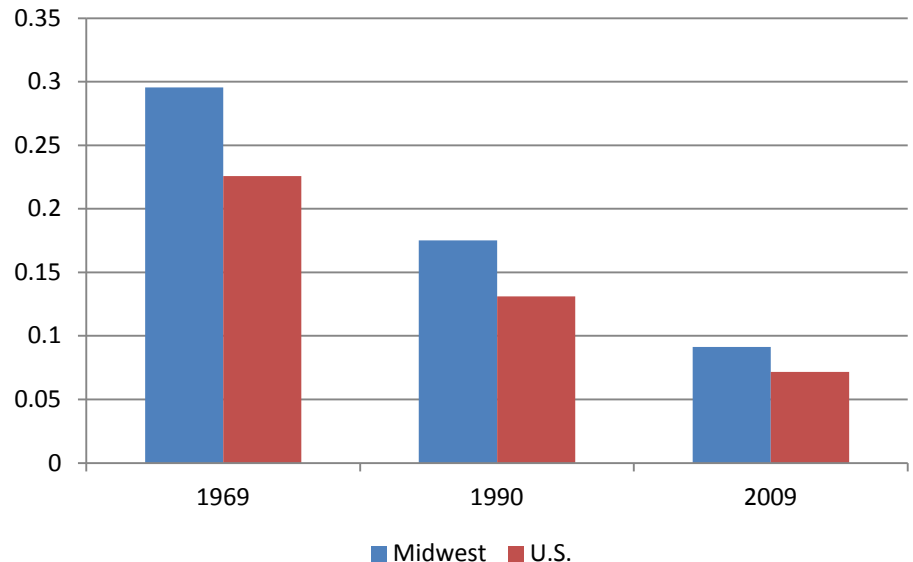
## Manufacturing Jobs (83 MSAs)



“Midwest” MSAs experienced a loss of over one-half of their industrial jobs since 1969.

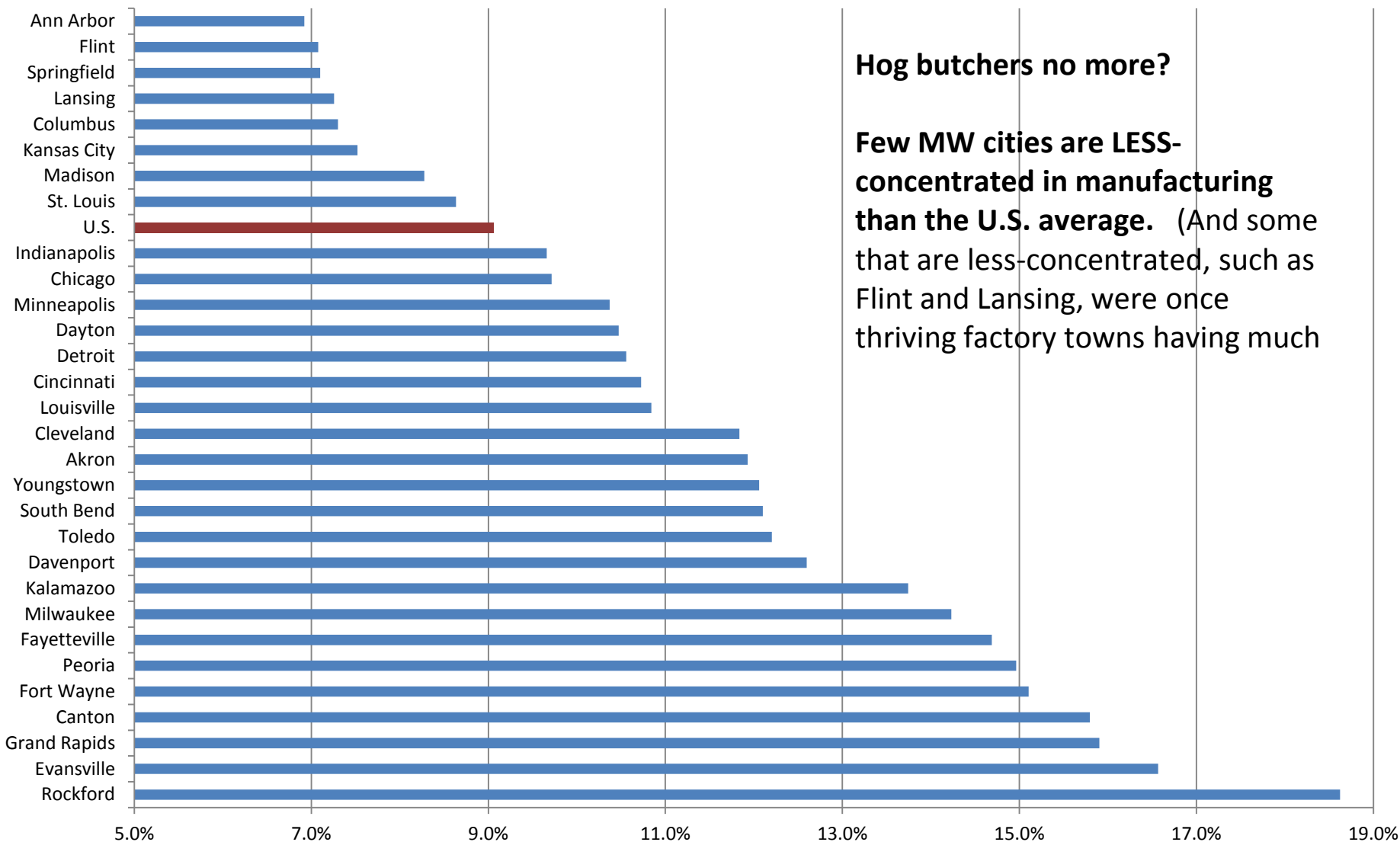
MW MSAs continue to be significantly more concentrated in manufacturing than the overall U.S. economy....albeit at a lower fraction of their workforce.

## Manufacturing Share (83 MSAs)



# Share of Jobs in Manufacturing 2009

30 largest MSAs from IL, IN, IA, MI, MN, MO, OH, WI

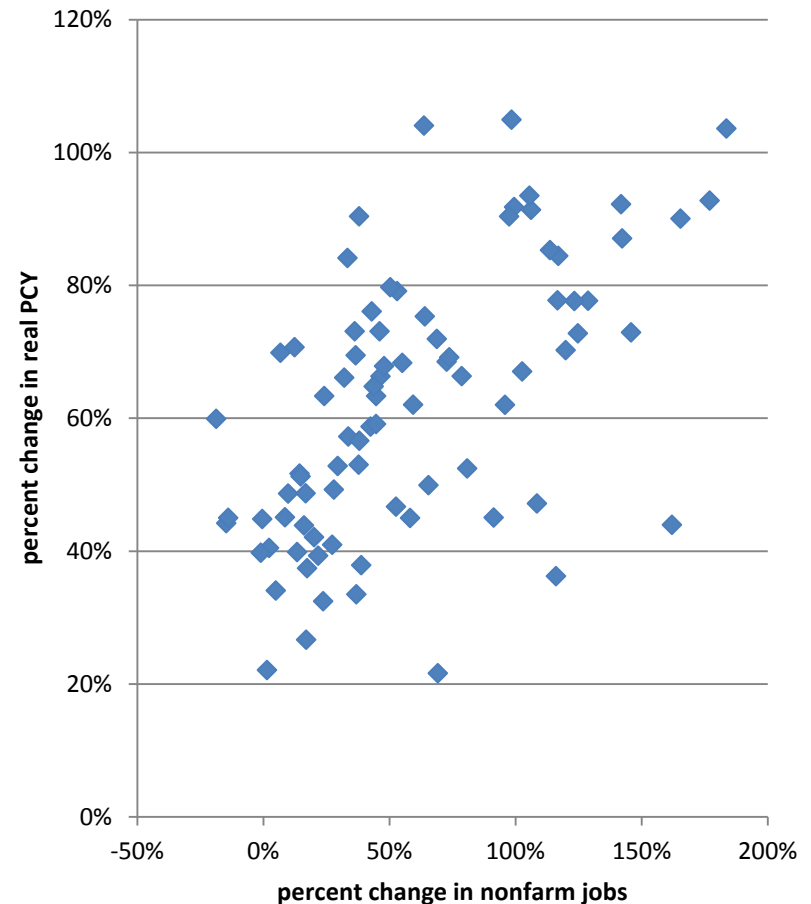


**Hog butchers no more?**

**Few MW cities are LESS-concentrated in manufacturing than the U.S. average.** (And some that are less-concentrated, such as Flint and Lansing, were once thriving factory towns having much

# Growth measures—jobs and per capita income

- From 1969-2009 among MW MSAs, there are vast differences in growth performance—this means that there is much to study and learn
- **Generally, growing places enjoy more robust income growth, too (not always, later example of Pittsburgh)**





# What have been the national trends w.r.t. manufacturing and cities?

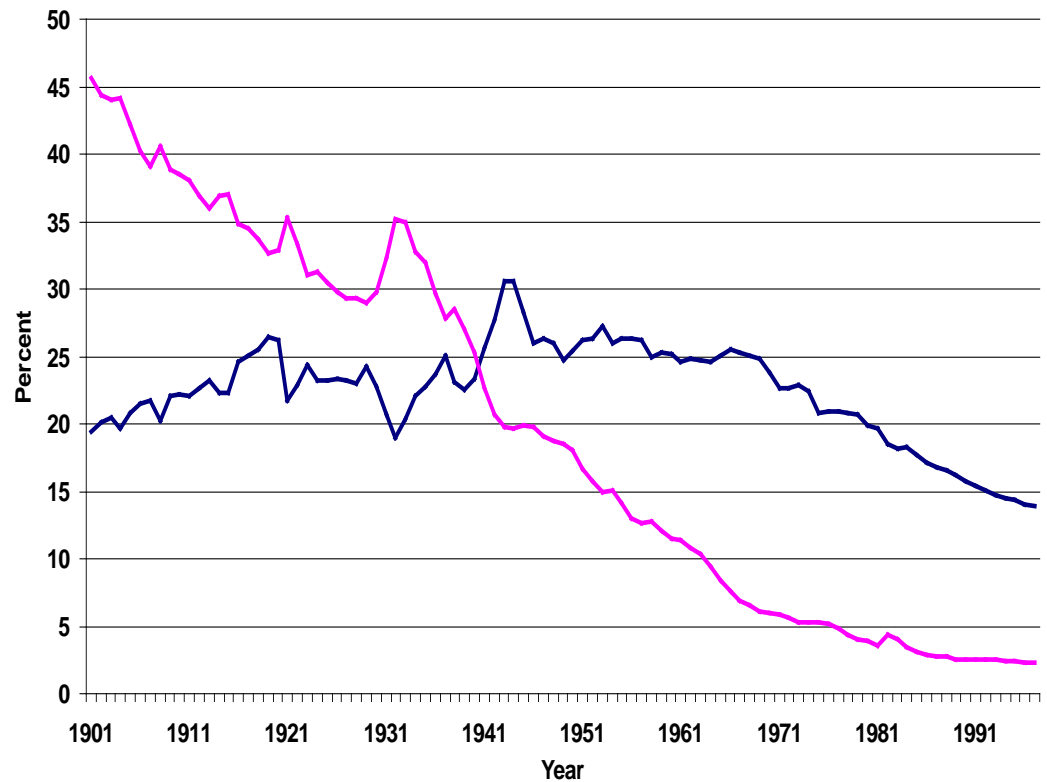
- “Cities exist to economize on transportation costs or to facilitate movement of goods, people, and ideas.” (Glaeser, Detroit v. NYC e.g.)
- U.S. manufacturing output in real terms has grown apace of overall economy, but using less labor. (a potential disaster for mfg. cities).
- “In 1950, 7 of 8 of U.S. largest cities were manufacturing oriented; only 2 of 8 now.” (E. Glaeser)
- Geographically, manufacturing suburbanized, then much of it went to rural areas, and then offshore.

# Mfg. employment rose thru last century; with Midwest gathering lion's share

Manufacturing is somewhat like production agriculture, but it will likely never dwindle so severely because “innovative” and “service type” functions often remain inside mfg. companies? (Note: Monsanto).

(In fact, Apple-type companies out-source virtually all production activities, and has little choice in doing so. ).

Industry Employment as percent of Total Employment: 1900 - 1997



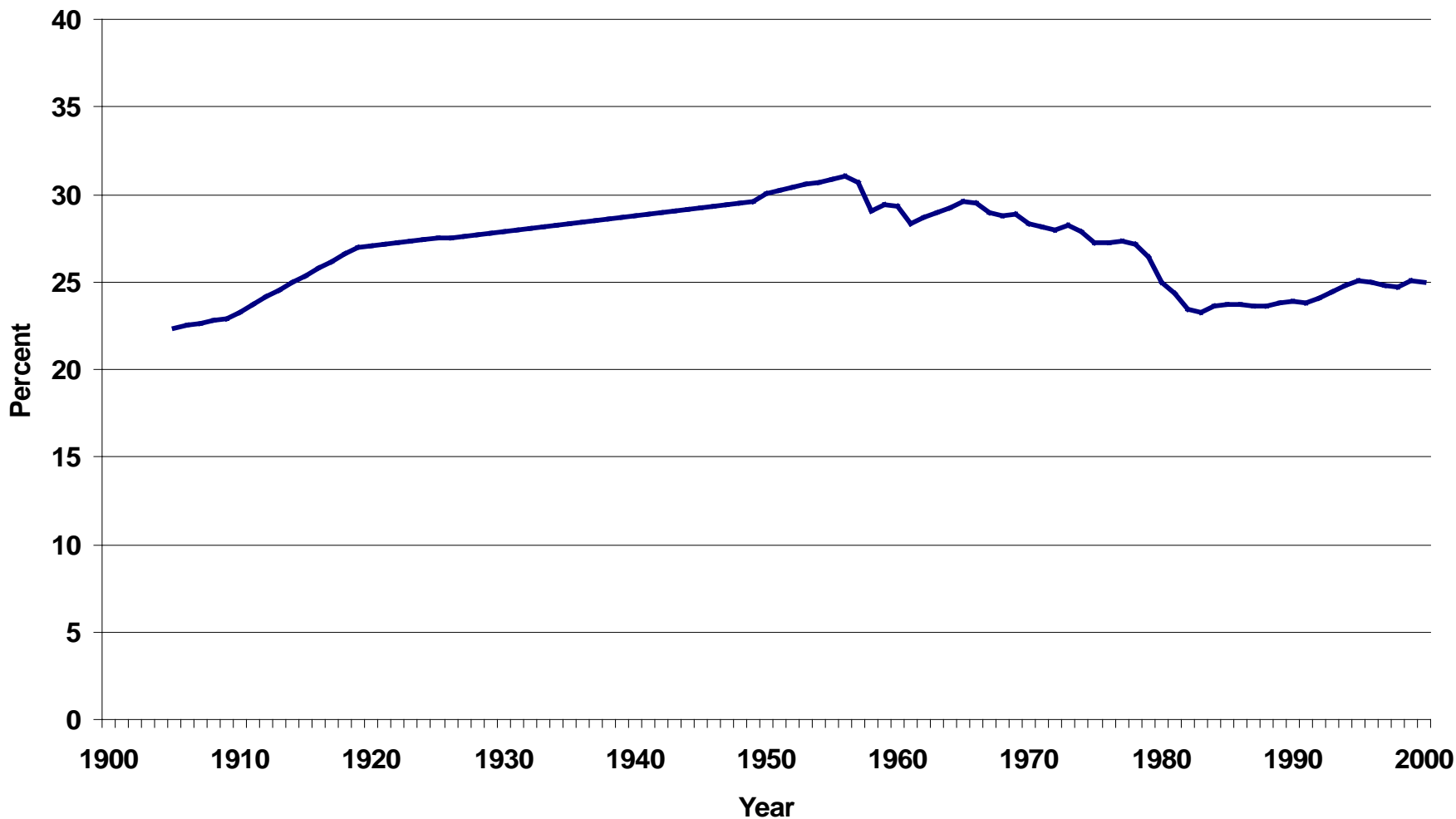
Sources: Historical Statistics of US, BLS, USDA

— Manufacturing/Total

— Agricultural/Total

# During manufacturing's ascent, the Midwest region was king

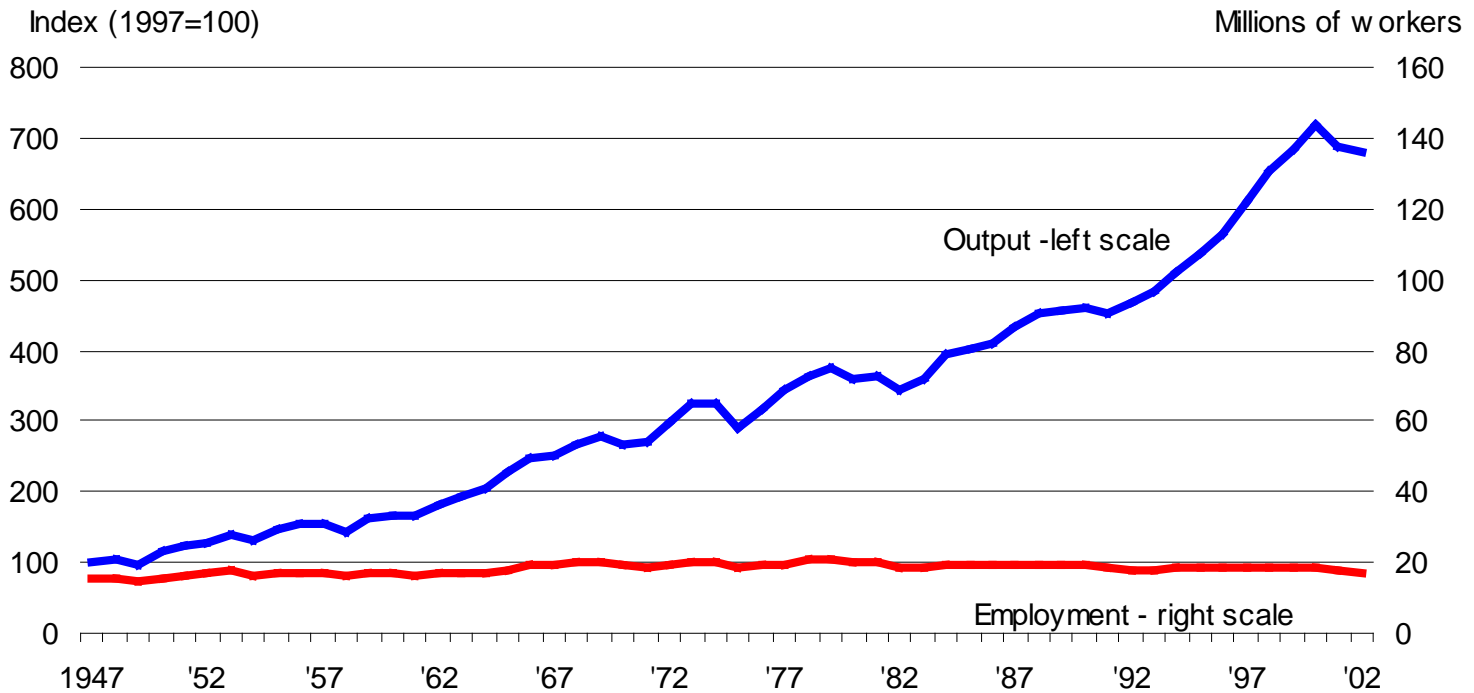
## Great Lakes MFG Employment as a Share of US MFG Employment



Sources: Bureau of Census and Bureau of Labor Statistics

# While manufacturing employment was flat over the previous 50 years, manufacturing output increased by 3.7% per year

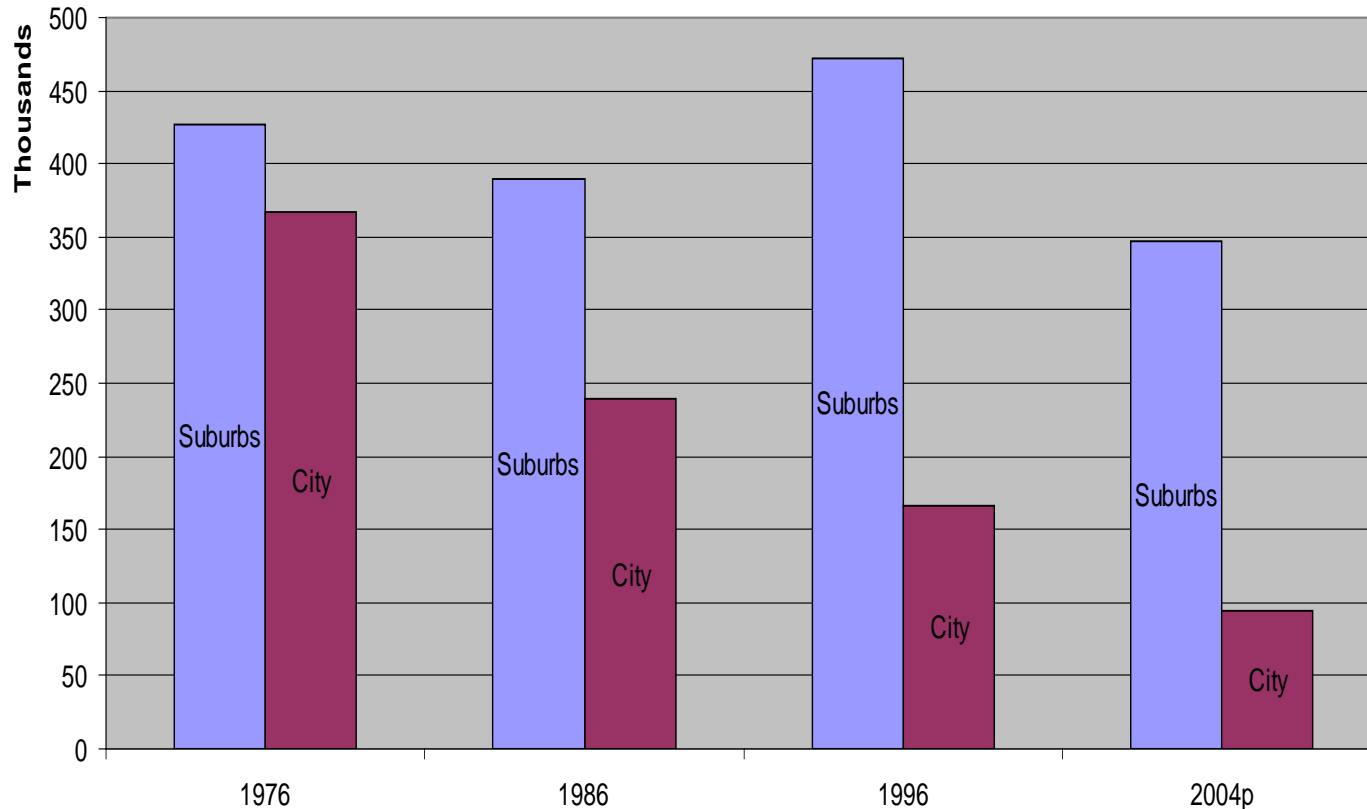
## Manufacturing



# The Chicago example of suburbanization of remaining manufacturing jobs....1976 to 2004

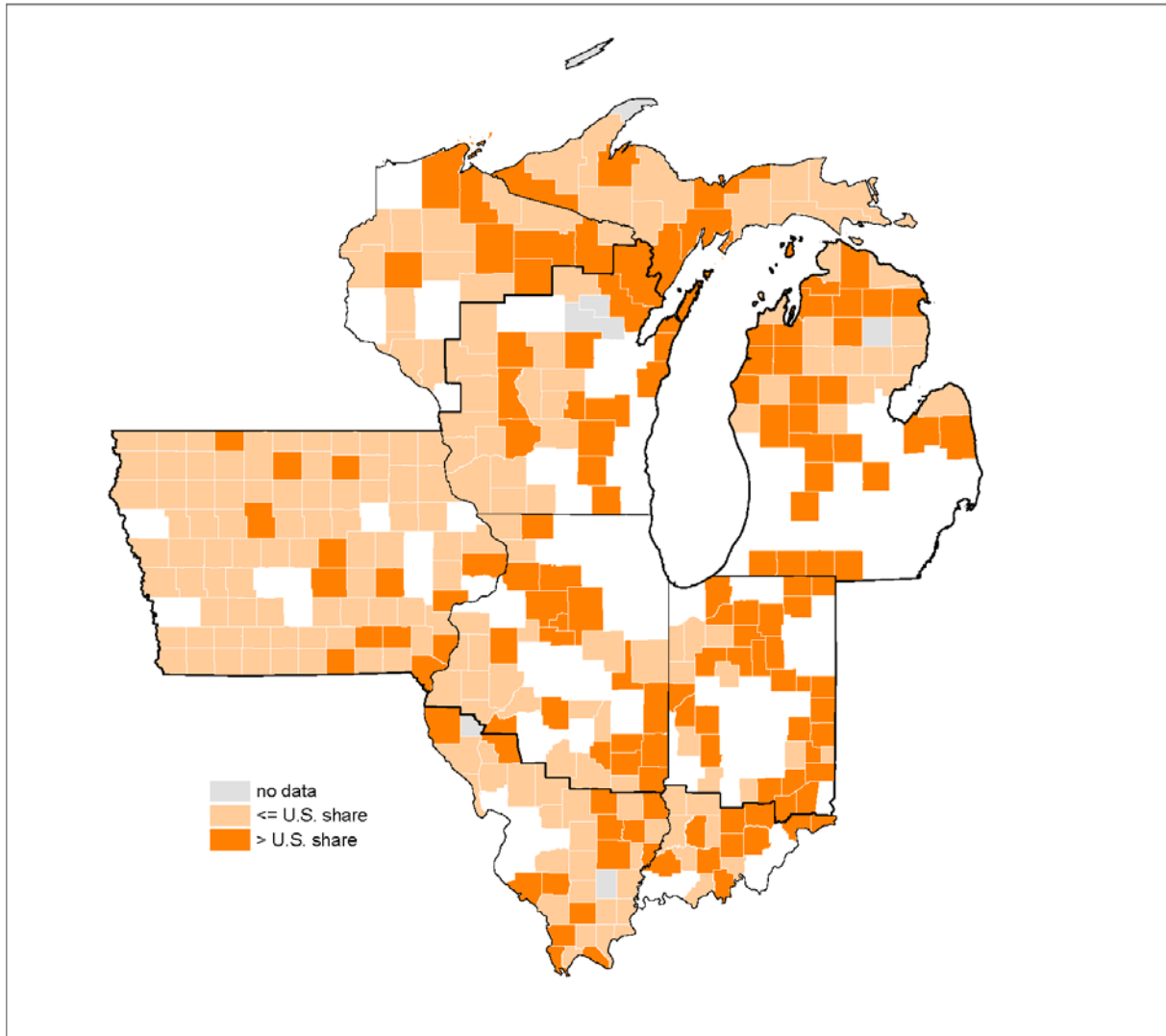
(as transportation costs fell and modes changed, and labor intensity fell, deconcentration took place)

Payroll manufacturing jobs, Chicago SMSA

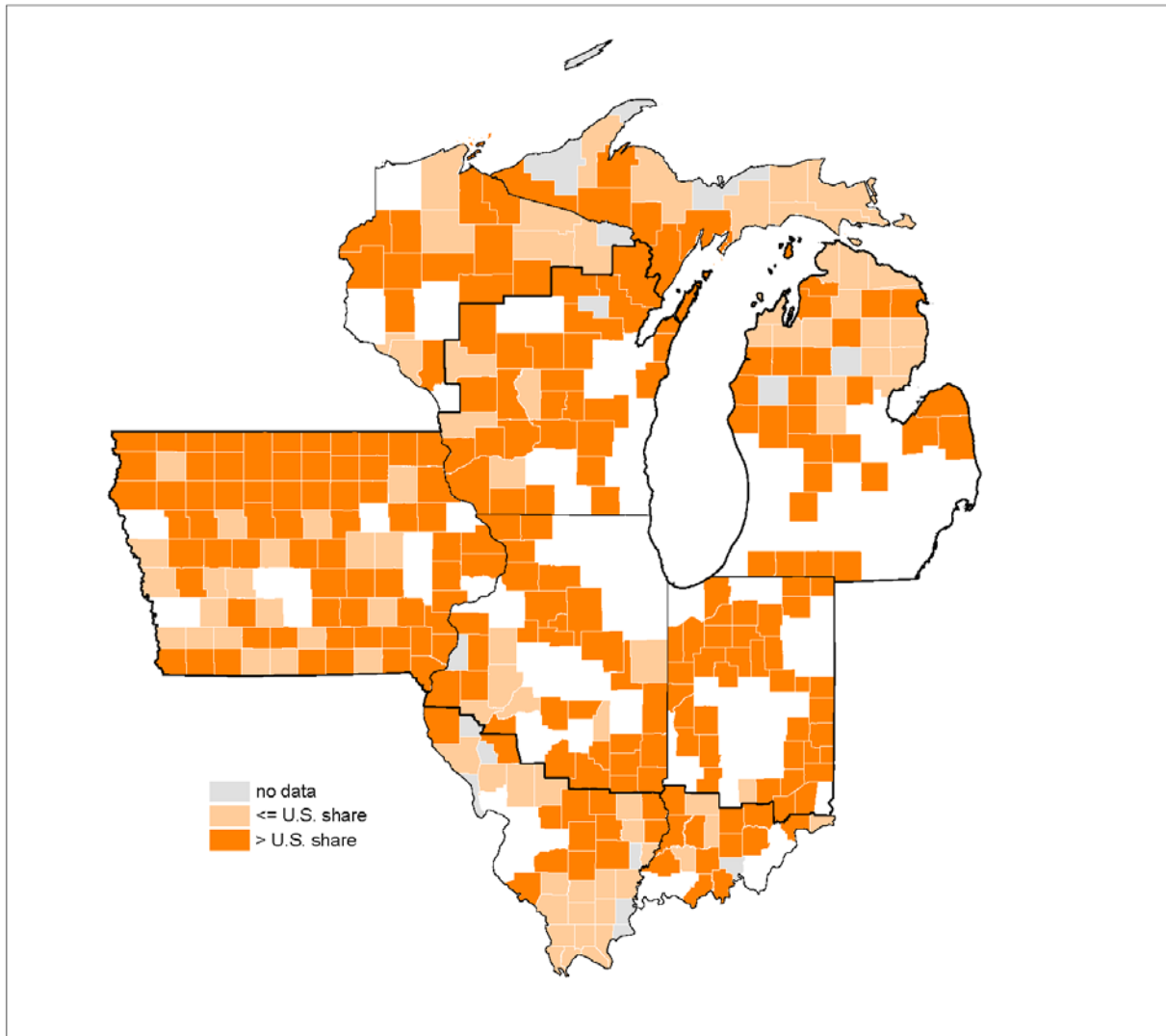


# The movement toward rural areas

Manufacturing Share of Jobs, 1969; Non-metro counties

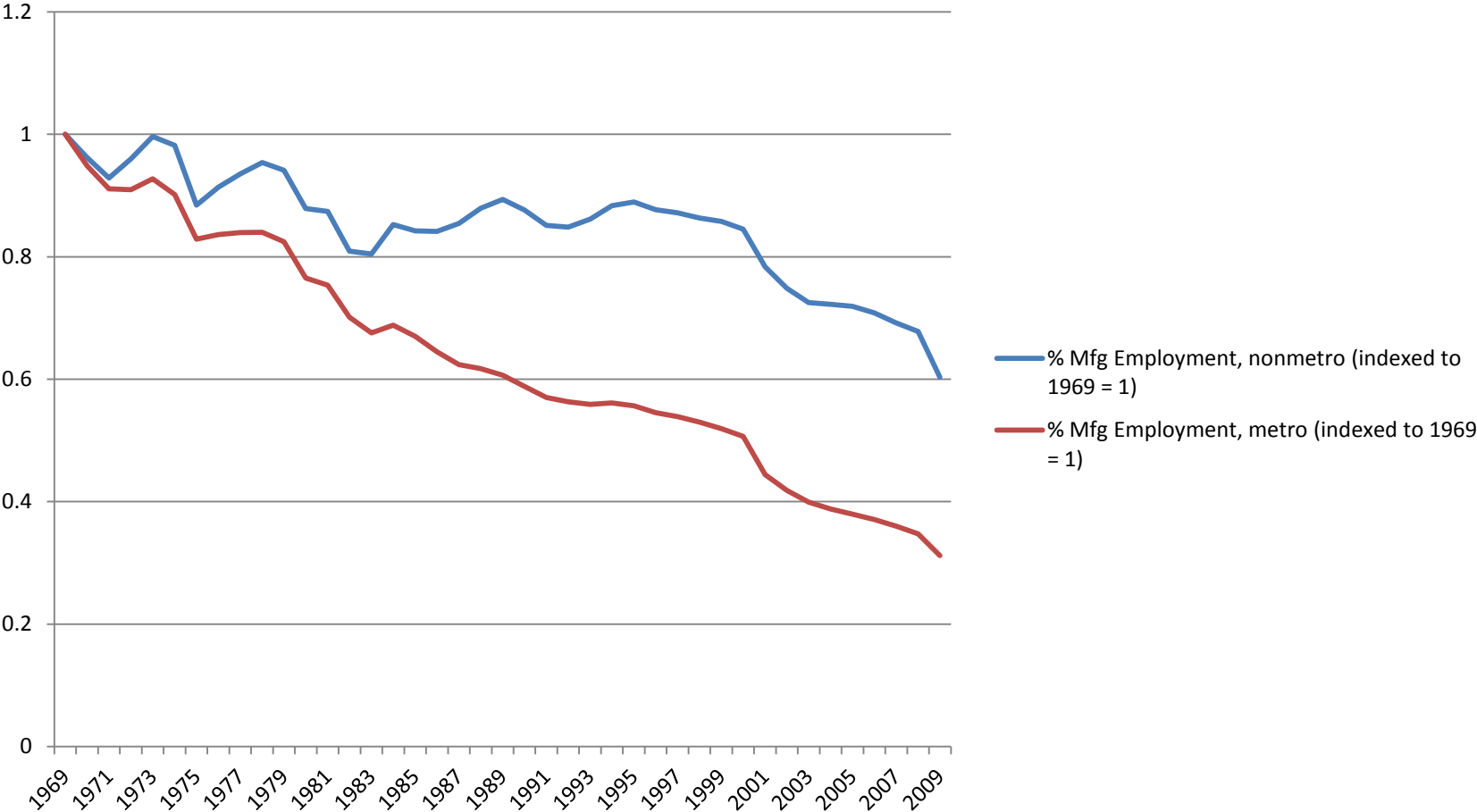


# Manufacturing Share of Jobs, 2009; Non-metro counties



# Declining jobs have fared “less worse” in District’s non-metro areas

Manufacturing Jobs 7th District





# How have impacted industrial cities adjusted to these shocks?

- Midwest cities suffered because its cities were manufacturing oriented, and also because most were deficit in educational attainment as associated with manufacturing.
- Losses often came in sudden wave or spurts, such as 1978-1983, and 1998-2003.
- "Did the Rust Belt Become Shiny? A Study of Cities and Counties that Lost Steel and Auto Jobs in the 1980s" with B. Sacerdote James Feyrer and Ariel Dora Stern. "We look at steel and auto industry shocks on the 1980s in the U.S. and the U.K. and ask how quickly and via what mechanisms cities adjusted to the job losses." *Brookings Wharton Papers on Urban Affairs: 2007.*

# “Did the Rust Belt Become Shiny?”

## Auto/steel shocks in 140 counties (350k steel/500k auto jobs lost)

- Shock period 1977-82
- By 1987, unemployment “normal” due to out-migration (5 years longer in U.K.)
- Long run per capita income and home price losses modest
- Growth level in population and jobs do not recover by 2004. (That is, labor out-migration, but little re-investment).

# Income impacts

- “Shock Counties” -- per capita income grows roughly apace with Non-shock counties”
- Per capita income can be difficult to interpret with outmigration.....low income population may move away, leaving behind a subset of high income occupations.
  - And also poor amenities of impacted town may require high income as compensation to attract/retain few remaining employees (e.g. Benton Harbor or Newton, IA)

## In sum...

- MW industrial cities suffer greatly from their mfg. orientation, especially during shocks
- Unemployment recovers, and PCY to some degree....but growth languishes long term; “out-migration and decline” is the general adjustment

# Outline: MW Industrial Cities from Broad Brush Statistical Overview

- Experience of Industrial Cities (statistical overview) and Recovery Patterns
- Are GL industrial cities different?

# Starting point: Education

## Why education matters?

- Re-invention of cities when shocks occur (e.g. Boston, NYC etc., warm weather cities show little ed. effect)
- “New economy” based on ideas and innovation, and there are spillovers in technological change (evidence from patents)
- Entrepreneurship evidence (firms employing educated workers thrived post-1990s)
- Wages of skilled workers rose faster post-1980
- Amenity hypothesis, that educated folks are good neighbors
- Workers “learn” in cities
- If education is key, policy is challenged somewhat:
  - Despite greater migration tendencies, there is a great deal of “stickiness” in where skilled workers locate (e.g. Glaeser found 1940 location of colleges determined BA+ workforce 40 years later).
  - Glaeser /Saiz find that skills driving *growth*, amenities not driving skills (and may be of limited value)
  - Still, there is also a literature that amenities matter (locally, per Glaeser), but also across MSAs as reflected in wages and home values by others.
    - The D. Florida v. E. Glaeser debate, Bohemians vs. Human Capital pure and simple (policy differs?)



# Study (C. Berry/E. Glaeser)

## Entrepreneurship follows....

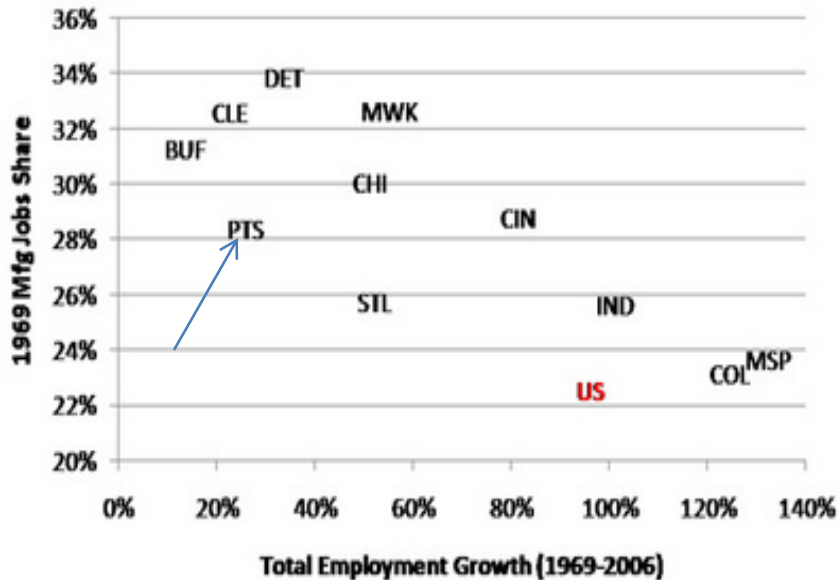
- Finding -- High skill cities (firms) tend to hire/employ or “create” jobs for other high skill employees (i.e. BA+)
  - Entrepreneurship important.  
(This....comparison made across 318 MSAs in both 2000 and 1970.)
- 
- Knock-on effect: wages converged 1970-80; wages diverged 1990-2000

# Outline: MW Industrial Cities from Broad Brush Statistical Overview

- Experience of Industrial Cities (statistical overview) and Recovery Patterns
- **If education/skills matter...How much can be explained by mfg. history?**
  - **Should we be featuring the “industrial city” in policy and understanding?**
  - **And if so, can MW Industrial Cities determine their own fate?**

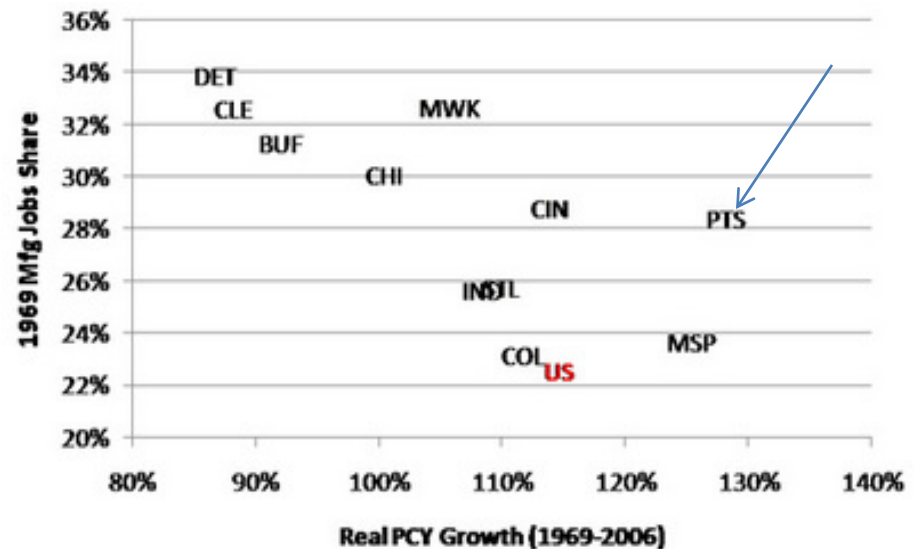


# Does Industry matter? (or only education?) Manufacturing seems to matter greatly in GL large MSAs.



Pittsburgh has succeeded in raising incomes, but the price (trade-off) in out-migration has apparently been heavy

Job/population growth and per capita income are negatively correlated with a region's historical manufacturing concentration?



# Does the degree of manufacturing matter? (Past and present?)

**1995 Study by Ed Glaeser et al in *Journal of Monetary Economics***

-- 203 cities and MSAs, examining population, nonmfg. job growth, and income growth 1960-90; and 1950-70 and 1970 -90

-- educational attainment important to income growth, both high school/some college as well as college plus; Looking for “educational spillovers” as growth in technology and learning.

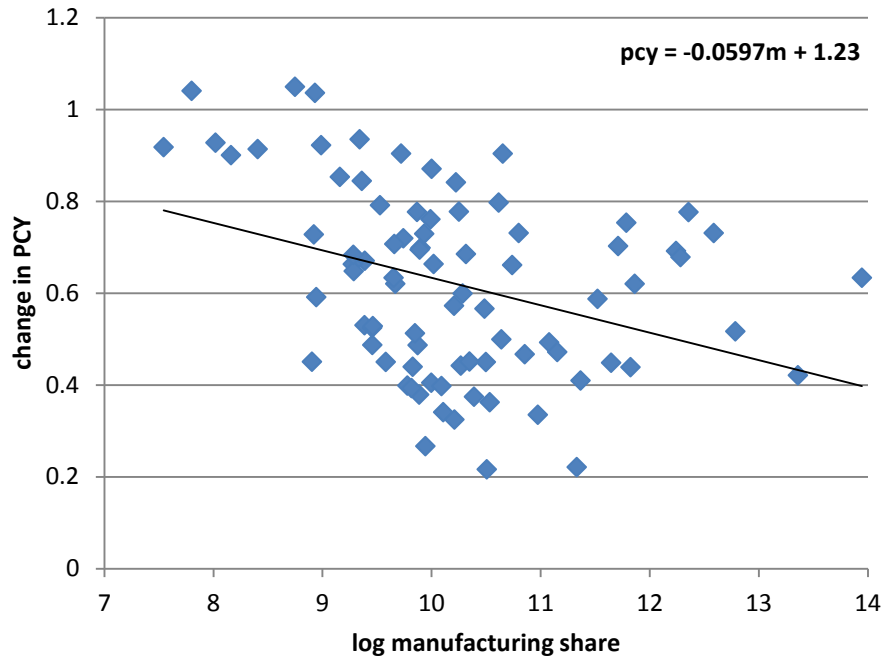
--manufacturing share (1960) adversely affects income and population growth

-- Comparing two periods effect on population

(1) mfg. share more important in 1950-70 period

(2) median years of school important in later period largely

--“explained variation” .35 - .50” is higher than in my study (possible due to focus on cities rather than MSAs)

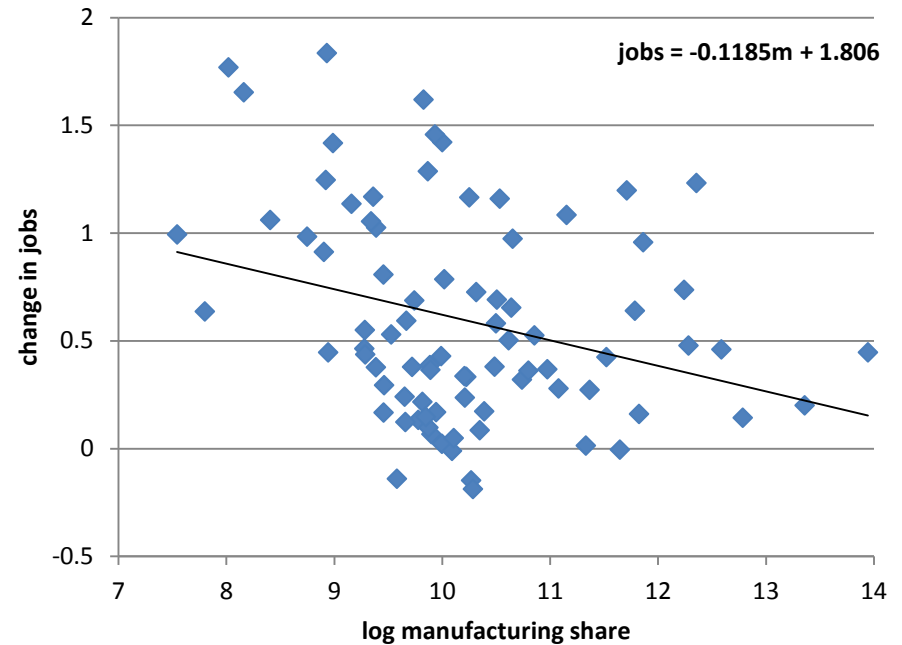


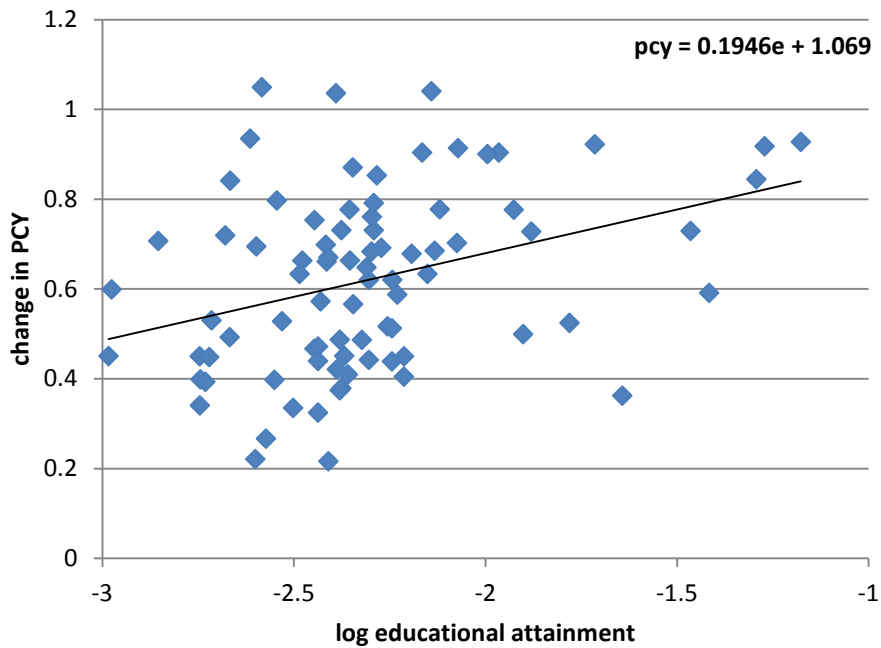
## -- Mfg. share dampens growth

- (1) per capita income growth and
- (2) jobs growth

versus mfg. share:

Correlations among 83 Midwest MSAs  
(Testa/Wang)

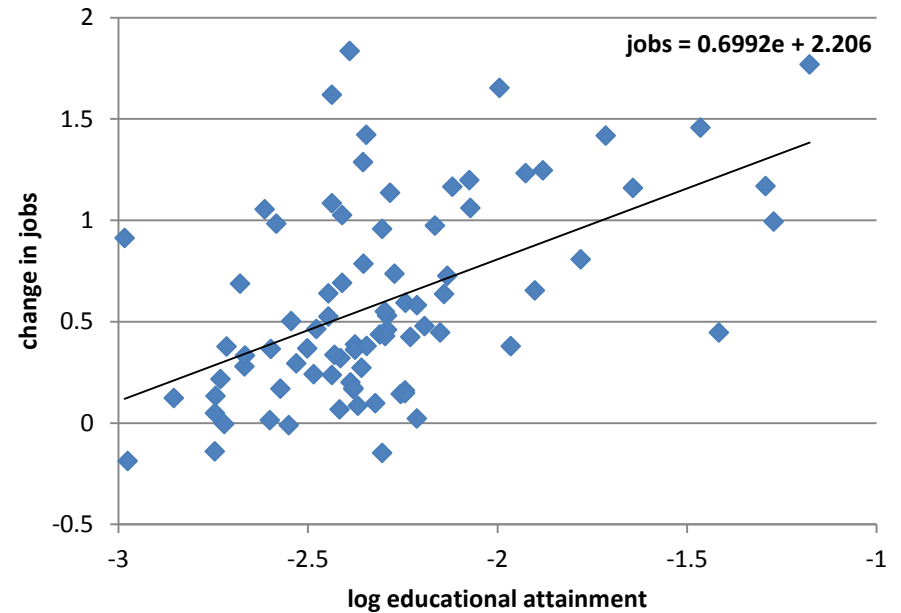




## -- Education boosts growth

Initial educational attainment (college+)

1. Boosts both income and jobs growth



## Summary of own results:

“log-log” regressions of job or per capita income growth as function of initial mfg. share of workforce and share of workforce with college attainment

-- Both manufacturing share and education “explain” subsequent growth of jobs and income (income is “harder” to explain)

-- Education variable is stronger

-- Education is dominant, but adding mfg. does NOT cause education effect to rise

-- There is much “unexplained” variation in growth

<b>Total Job Growth</b> across 83 Midwest MSAs 1969-2009			
OLS regressions: coef and t-stat			
education 1970	<b>0.699</b>		<b>0.649</b>
	5.45		5.09
manu share 1969		<b>-0.119</b>	<b>-0.084</b>
		-2.76	-2.19
r-squared	0.269	0.086	0.310
<b>Total PCY Growth</b> across Midwest MSAs 1969-2009			
OLS regressions: coef and t-stat			
education 1970	<b>0.194</b>		<b>0.164</b>
	3.33		2.89
manu share 1969		<b>-0.060</b>	<b>-0.051</b>
		-3.43	-3.00
r-squared	0.121	0.127	0.209

# Comparing 1969-90 vs 1990-2009

## Explaining total job growth

	1969-1990	1990-2009
Education attainment		
Mfg. share		
Both mfg & education		Ed. only

1. Mfg. coefficient significant only 1969-90

## Explaining per capita income growth

	1969-1990	1990-2009
Education attainment		
Mfg. share		
Both mfg. & education	Ed. only	

1. mfg. share depressing PCY (? Wages) in 1990-2009

# Do 1969/70 conditions of education and manufacturing continue to affect 1990-2009 outcomes? YES!!!

	Jobs 1990-2009	Per capita Income 1990-2009
Education attainment 1970		
Manufacturing share 1969		
Both variables		

1. Both variables significant in all functional forms.
2. R-squared (explained variation) is only slightly lower than using 1990 explanatory variables (and greater for univariate mfg. regression)

## Success or not?

From the two-variable regressions 1669-2009, which MSAs appear to be “winners” and “losers” based on their 1969 conditions of manufacturing base and of educational attainment?

MSAs likely have unique characteristics that are not accounted for....e.g. both Flint, MI and Ann Arbor, MI, would be predicted to have had greater income growth.

Apparent success may actually be disappointment.

Per Capita Income	
Winners (top 15)	Losers (bottom 15)
<b>1 Cape Girardeau-Jackson, MO-IL</b>	83 Elkhart-Goshen, IN
2 St. Cloud, MN	<b>82 Ann Arbor, MI</b>
<b>3 Wausau, WI</b>	81 Jackson, MI
4 Omaha-Council Bluffs, NE-IA	<b>80 Flint, MI</b>
5 Huntington-Ashland, WV-KY-OH	79 Muskegon-Norton Shores, MI
6 Grand Forks, ND-MN	78 Janesville, WI
<b>7 Green Bay, WI</b>	<b>77 Battle Creek, MI</b>
8 Evansville, IN-KY	76 Champaign-Urbana, IL
9 Louisville-Jefferson County, KY-IN	<b>75 Saginaw-Saginaw MI</b>
10 St. Louis, MO-IL	74 Lafayette, IN
<b>11 Minneapolis-St. Paul-Bloomington</b>	73 Rockford, IL
<b>12 Duluth, MN-WI</b>	72 Mansfield, OH
13 Chicago-Joliet-Naperville, IL-IN-WI	<b>71 Kokomo, IN</b>
<b>14 La Crosse, WI-MN</b>	70 Holland-Grand Haven, MI
15 Cincinnati-Middletown, OH-KY-IN	69 Michigan City-La Porte, IN
Total Jobs	
Winners (top 15)	Losers (bottom 15)
1 St. Cloud, MN	83 Champaign-Urbana, IL
2 Holland-Grand Haven, MI	82 Anderson, IN
3 Green Bay, WI	81 Battle Creek, MI
4 Appleton, WI	80 Springfield, OH
5 Fargo, ND	79 Muncie, IN
6 Grand Rapids-Wyoming, MI	78 Danville, IL
7 Monroe, MI	77 Ames, IA
8 Wausau, WI	76 Decatur, IL
9 Columbus, OH	75 Duluth, MN-WI
10 Minneapolis-St. Paul-Bloomington	74 Niles-Benton Harbor, MI
11 Indianapolis-Carmel, IN	73 Kokomo, IN
<b>12 Des Moines-West Des Moines, IA</b>	72 Bay City, MI
13 Cape Girardeau-Jackson, MO-IL	71 Saginaw MI
14 La Crosse, WI-MN	70 Steubenville-Weirton, OH-WV
15 Eau Claire, WI	69 Dayton, OH



# At end

- **Evaluation of success/failure must be measured against initial conditions (education and industry base....and lots more).**
- **Manufacturing ever-present, cannot be neglected in many instances**
  - MW continues to be mfg-intensive
  - Former industrial features and base continue to influence performance
    - But if so, what are the linkages (for policy)? Amenities/infrastructure? Work culture? Leadership/re-invention? Entrepreneurial culture?
- **Much remains unexplained: both “background” and “discretionary” policy may be influential**

# Outline: MW Industrial Cities from Broad Brush Statistical Overview

- Experience of Industrial Cities (statistical overview) and Recovery Patterns
- How much can be explained by mfg. history?  
**Can MW Industrial Cities determine their own fate?**
- This remains to be seen....and to be discussed