# Supply base – Size and Interdependency

James M. Rubenstein

Department of Geography

Miami University

Oxford Ohio 45056

rubensjm@muohio.edu

After the Perfect Storm

COMPETITIVE FORCES SHAPING THE AUTO INDUSTRY

May 10-11, 2010

# Supply Base: Size and Interdependency

## Outline:

- Why focus on supply base
- Changes in the supply base 2006-09
- Linkages across supply chains

# Parts suppliers data base

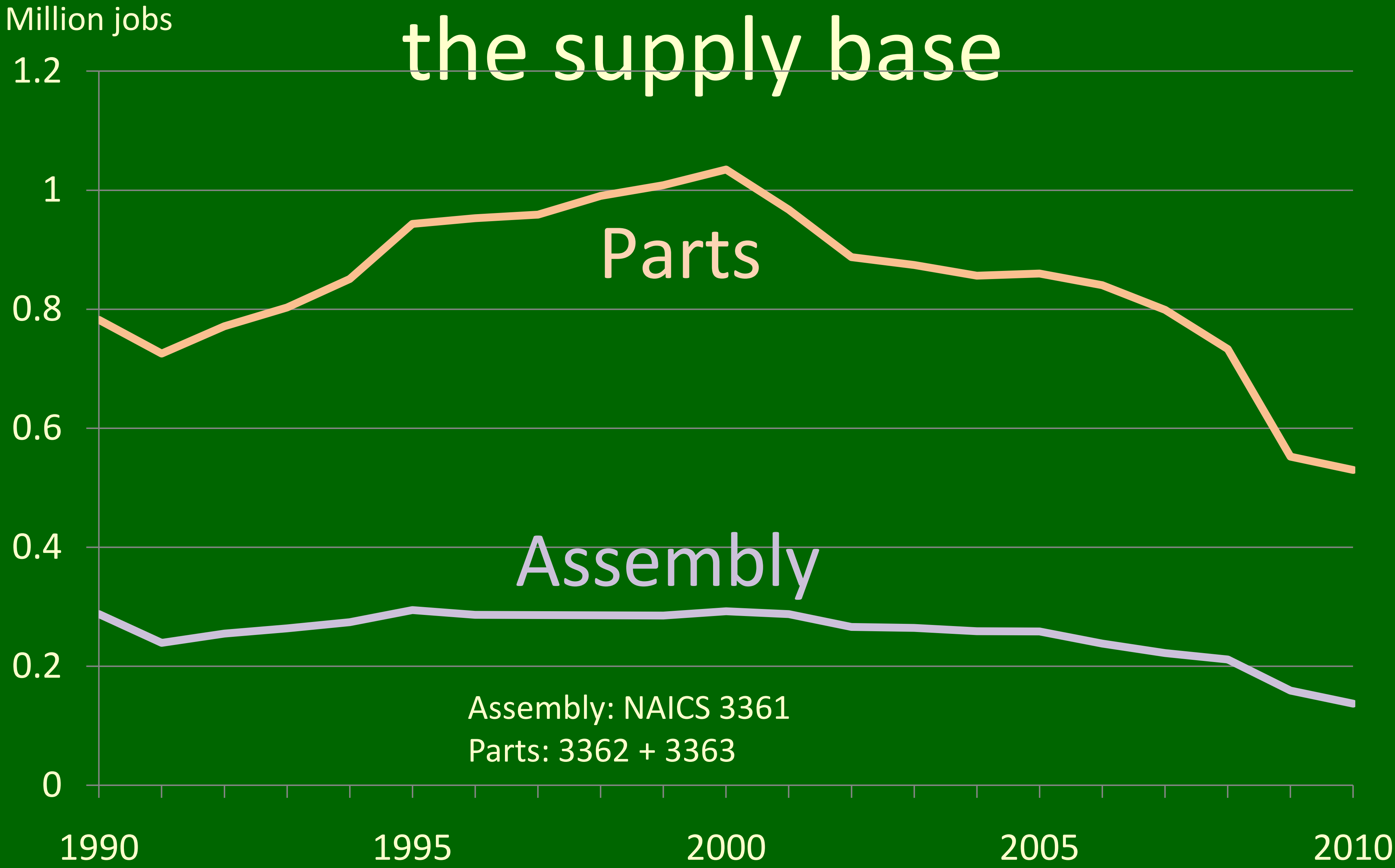
- 3,984 plants in North America in 2009
- Based on ELM International Inc. files
- Substantially altered by Thomas Klier and James Rubenstein
- Assistance from Taft Foster, Associate Economist, Federal Reserve Bank of Chicago

# Why focus on supply base?

- Suppliers account for
  - ➢70+% of value added in vehicles
  - ➢79% of auto industry jobs

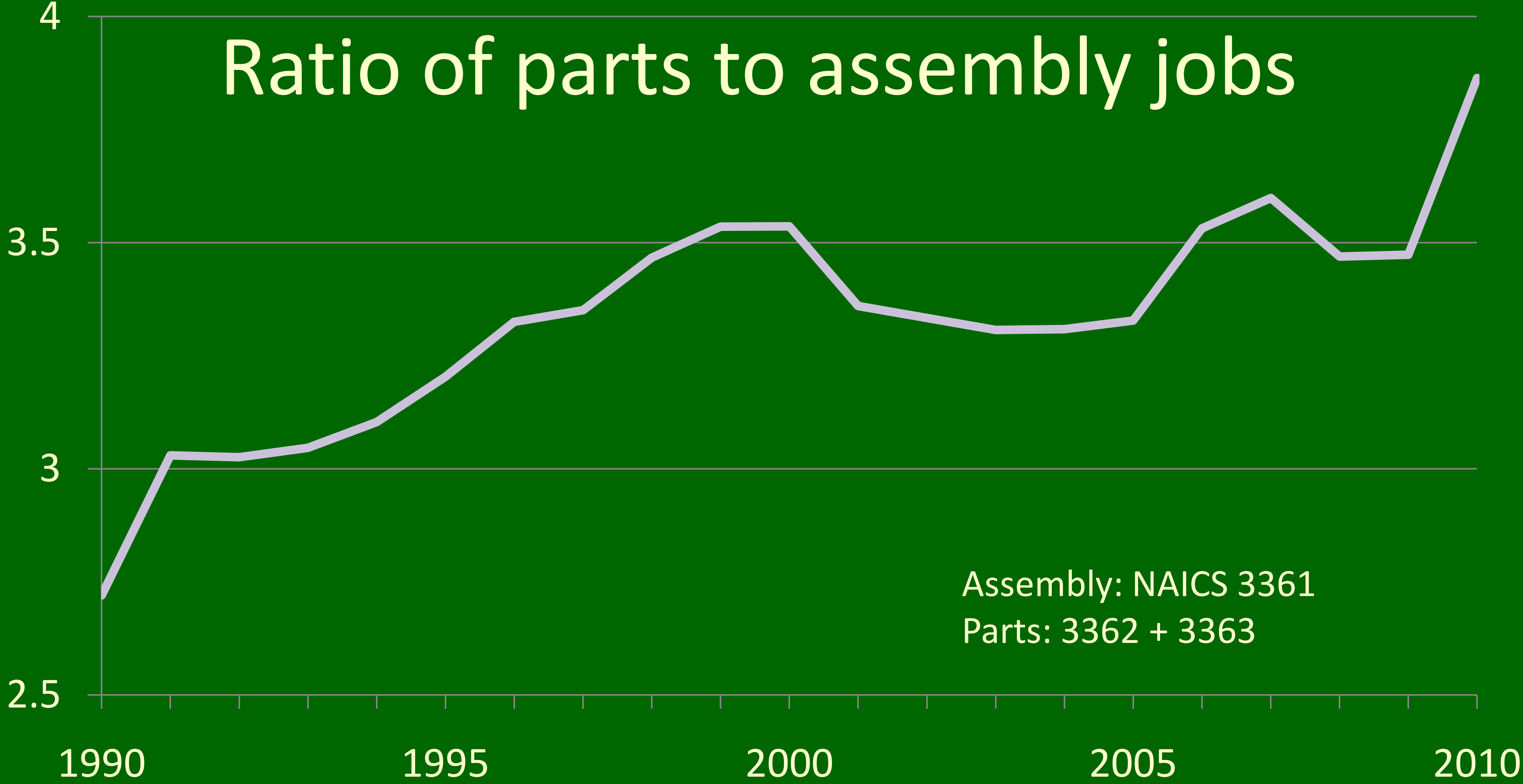
- But suppliers are little understood

# Most auto industry jobs are in the supply base




Source: BLS CES

# Suppliers have increasing share of auto industry jobs




Source: BLS CES

# Key changes in supply base 2006-09

- Change in plant count
- Change in types of parts
- Change in geography

# Number of supplier plants

## Only a modest decline 2006-09

- 2009: 3,984 plants
- 2006: 4,265 plants -6.6%

[Klier & Rubenstein/ELM Intl]

Compare to higher job loss 2006-09

- Parts: -37.1% * Assembly: -39.7%

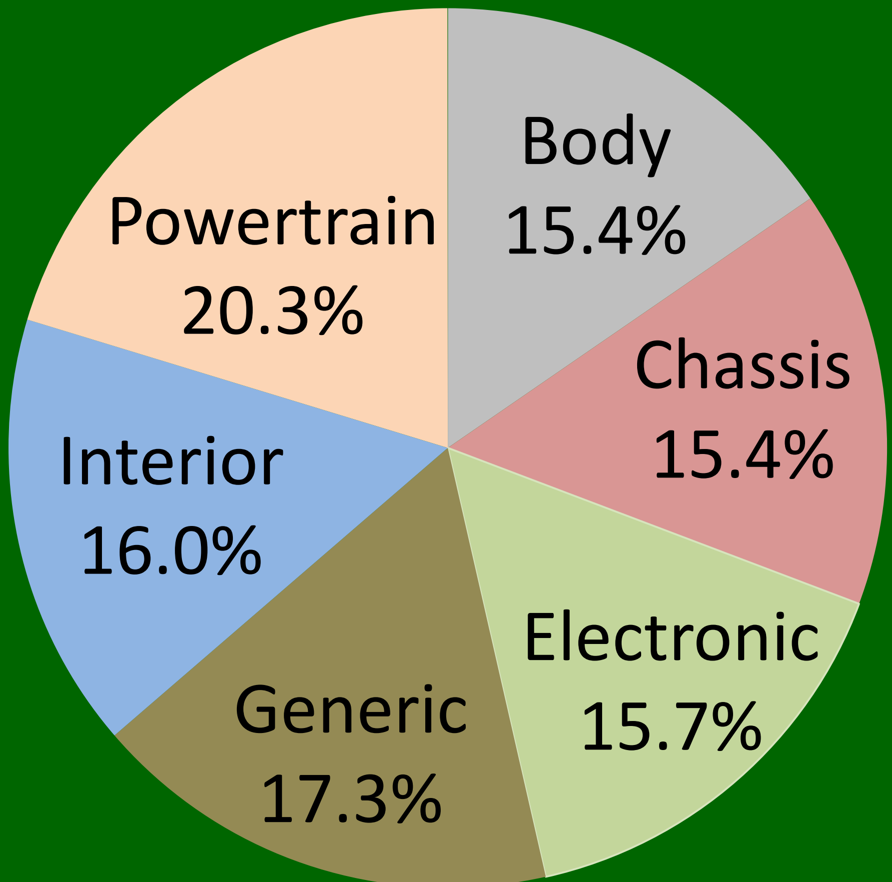
[BLS CES]

# Reasons for modest decline in plant count but sharp decline in employment?

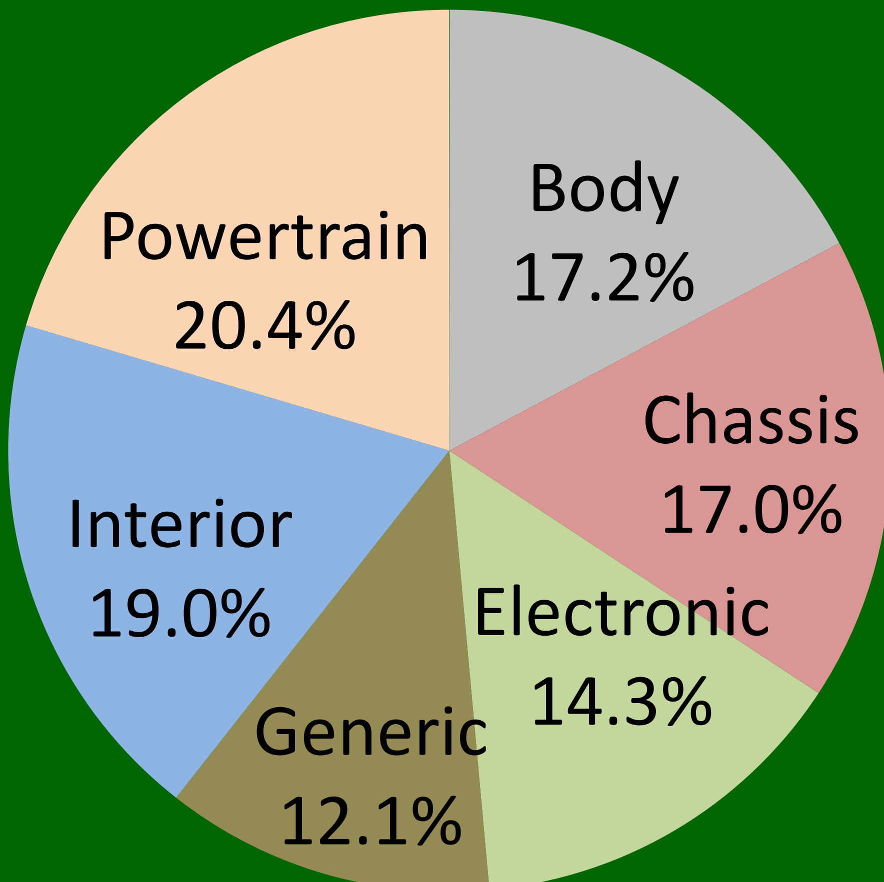
- Restructuring in some sectors
- Plants remain open with much lower workforce

# Changing types of parts plants

## 2009 plant count




## Closures 2006-09

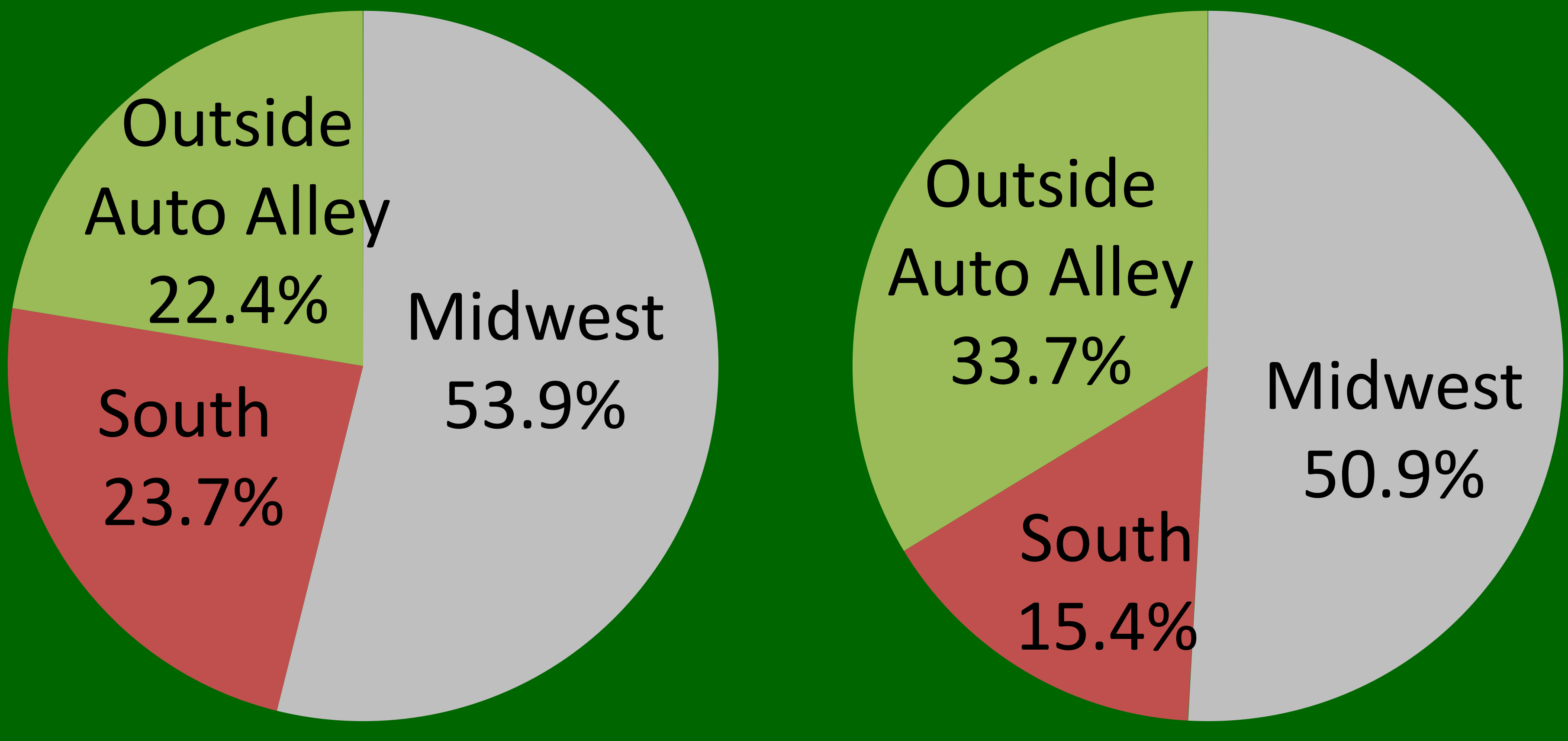


# Changing U.S. distribution

## Strengthening of Auto Alley

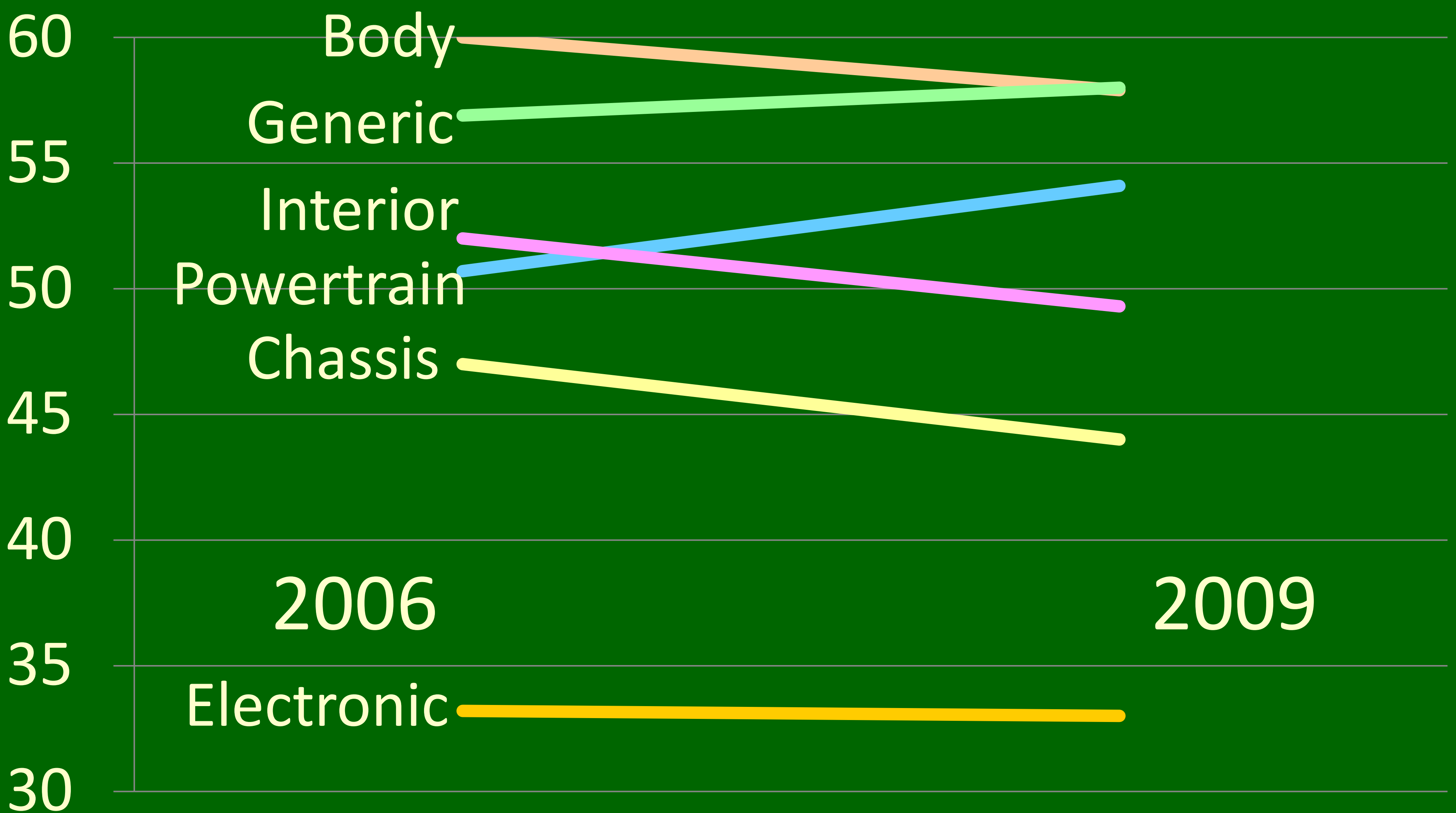
2009 Plant Count

Closures 2006-09



# Changing Midwest Parts Plants

## % U.S. plants in Midwest - 2006 & 2009



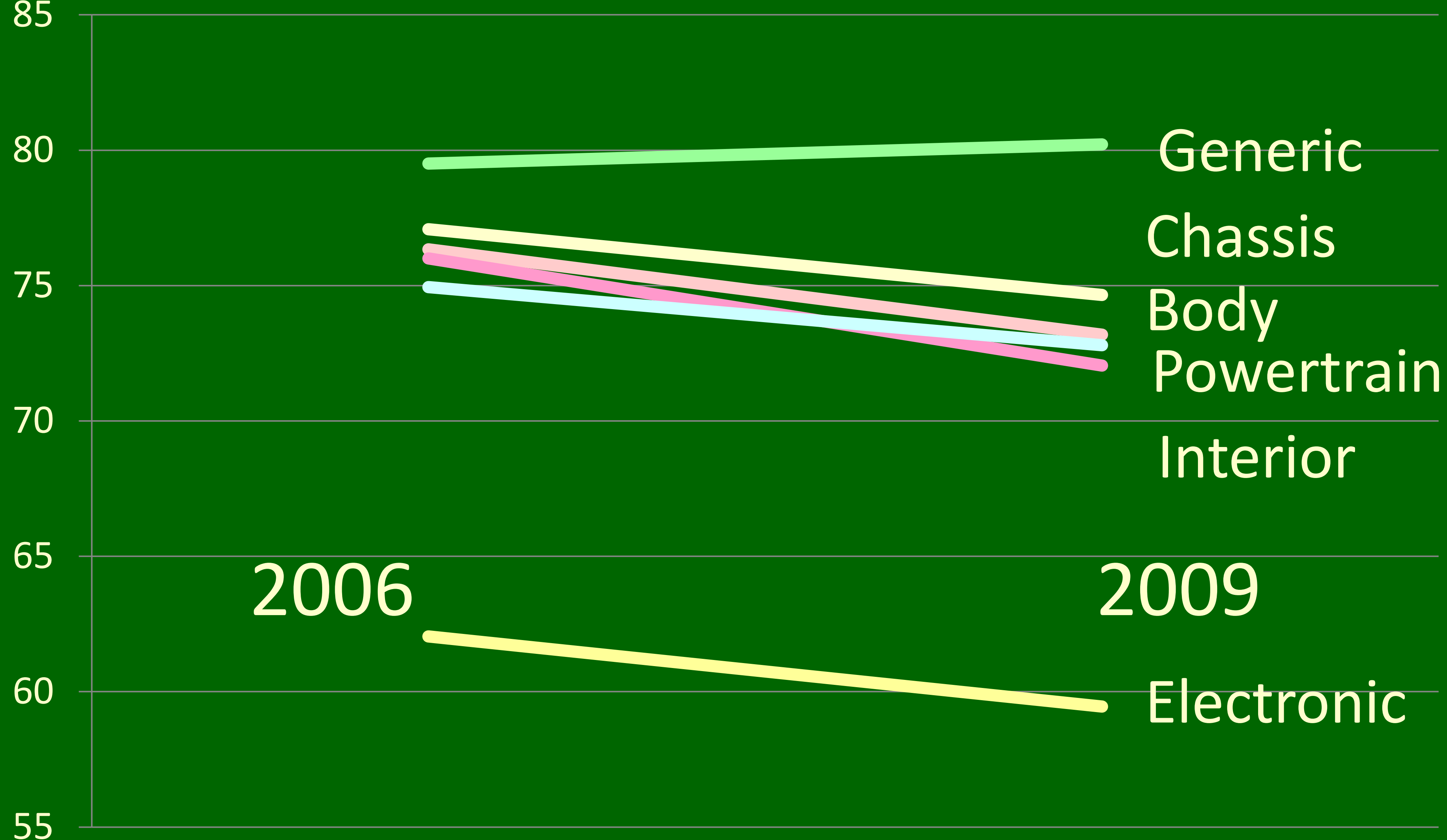
# Changing NAFTA distribution

## More plants in Mexico

| | # Plants | 2006-09 Change |
|---|---|---|
| U.S. | 2,881 | -9.1% |
| Canada | 414 | -0.5% |
| Mexico | 689 | +2.1% |
| Total | 3,984 | -6.6% |

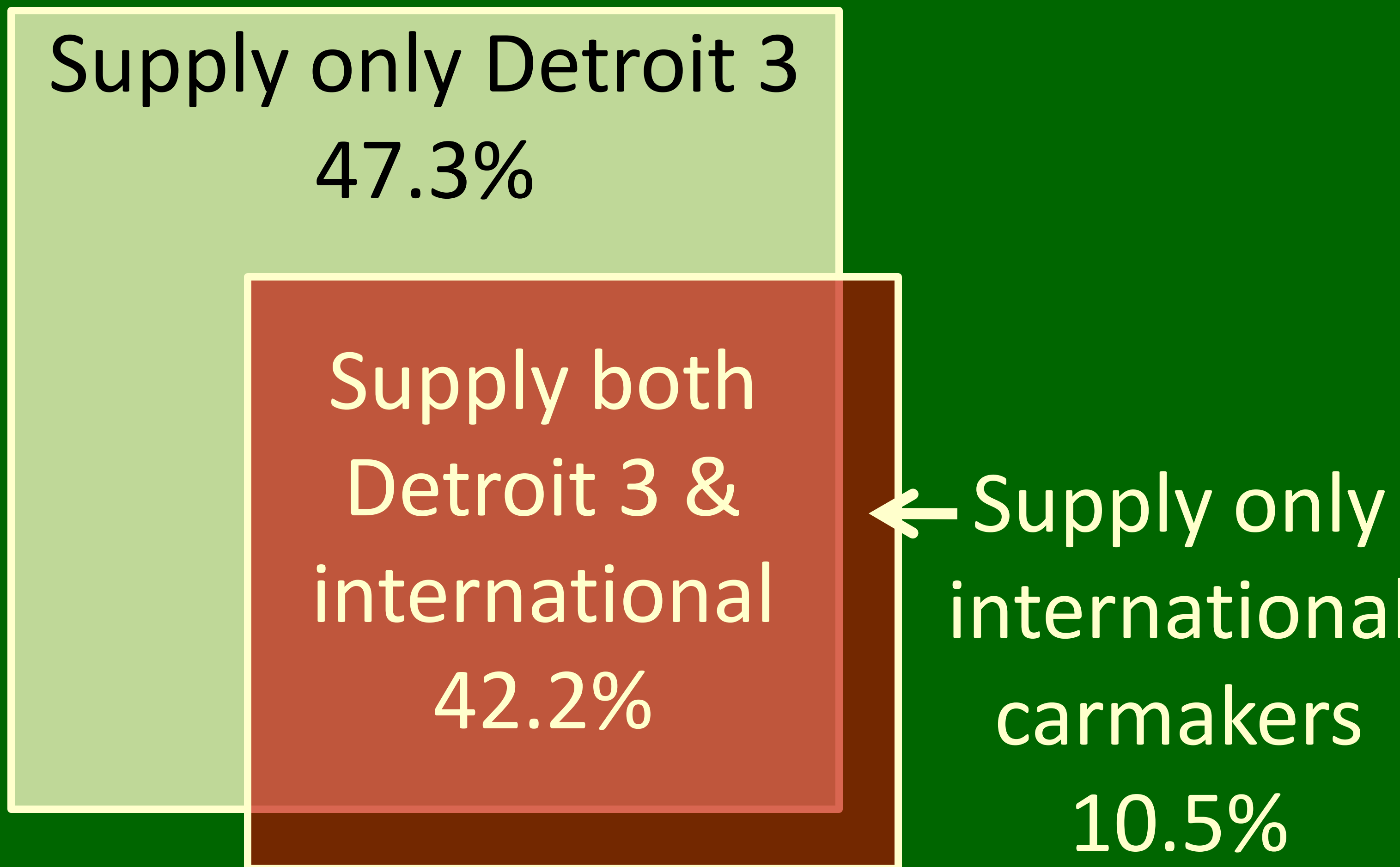
# Changing U.S. Parts Plants

## % NAFTA plants in U.S.



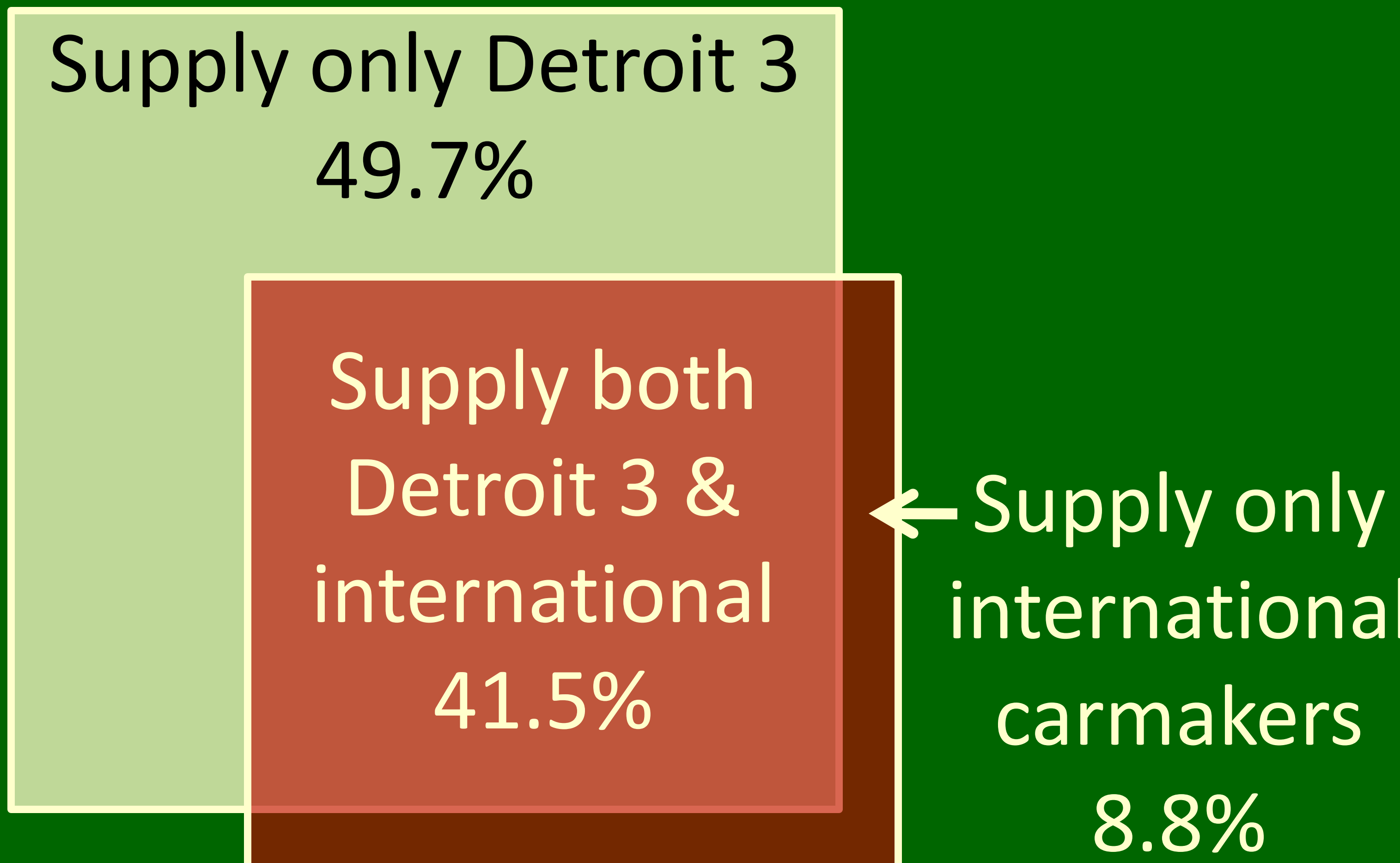
# Linkages among suppliers

## % of individual factories



# Linkages among closed suppliers

## % of closed factories 2006-09

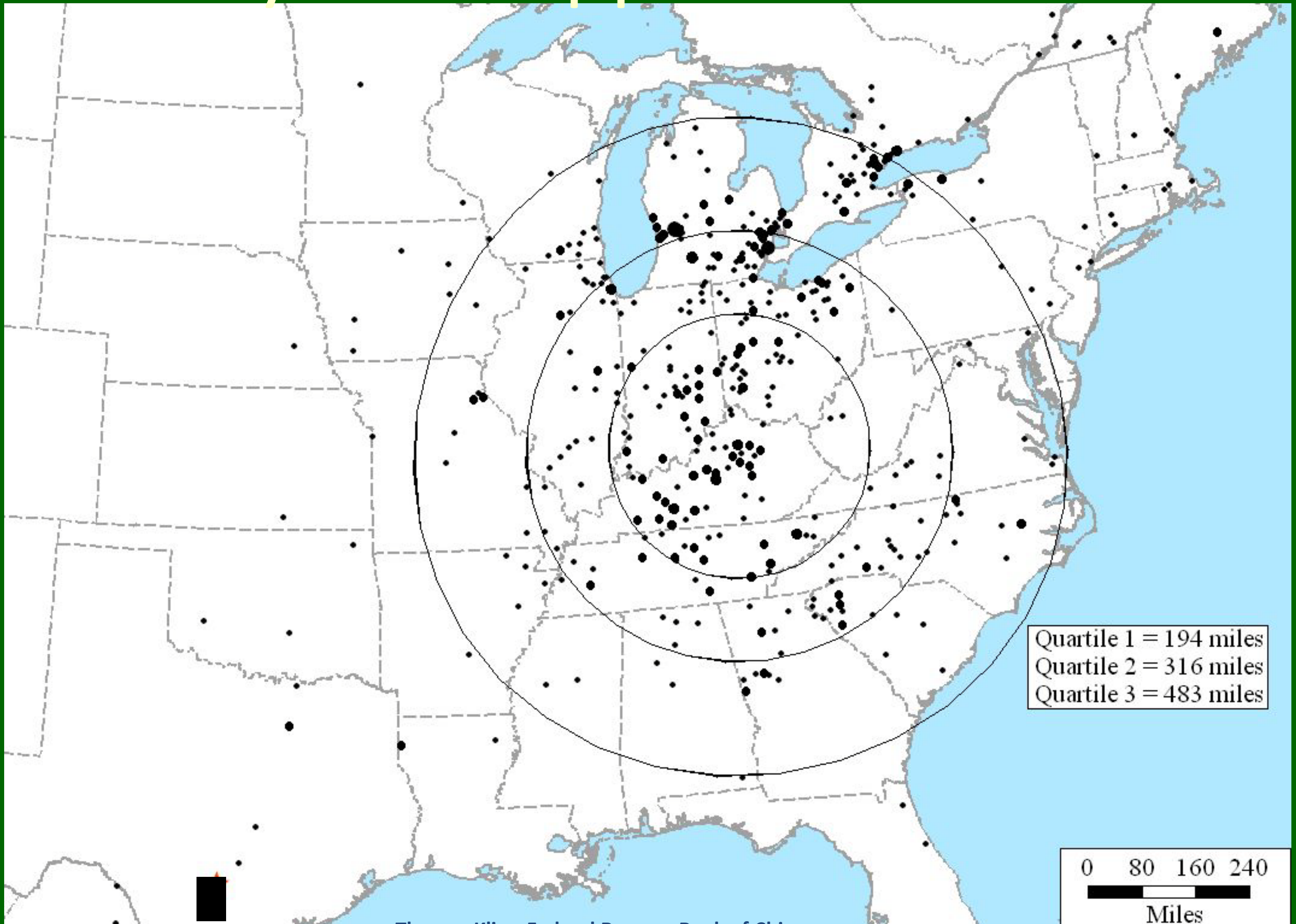


# Linkages among suppliers

| Suppliers to: | Also supplying to: Detroit 3 | Asian | Euro |
|---|---|---|---|
| Detroit 3 carmakers | 100% | 41% | 15% |
| Asian carmakers | 79% | 100% | 20% |
| European carmakers | 88% | 63% | 100% |

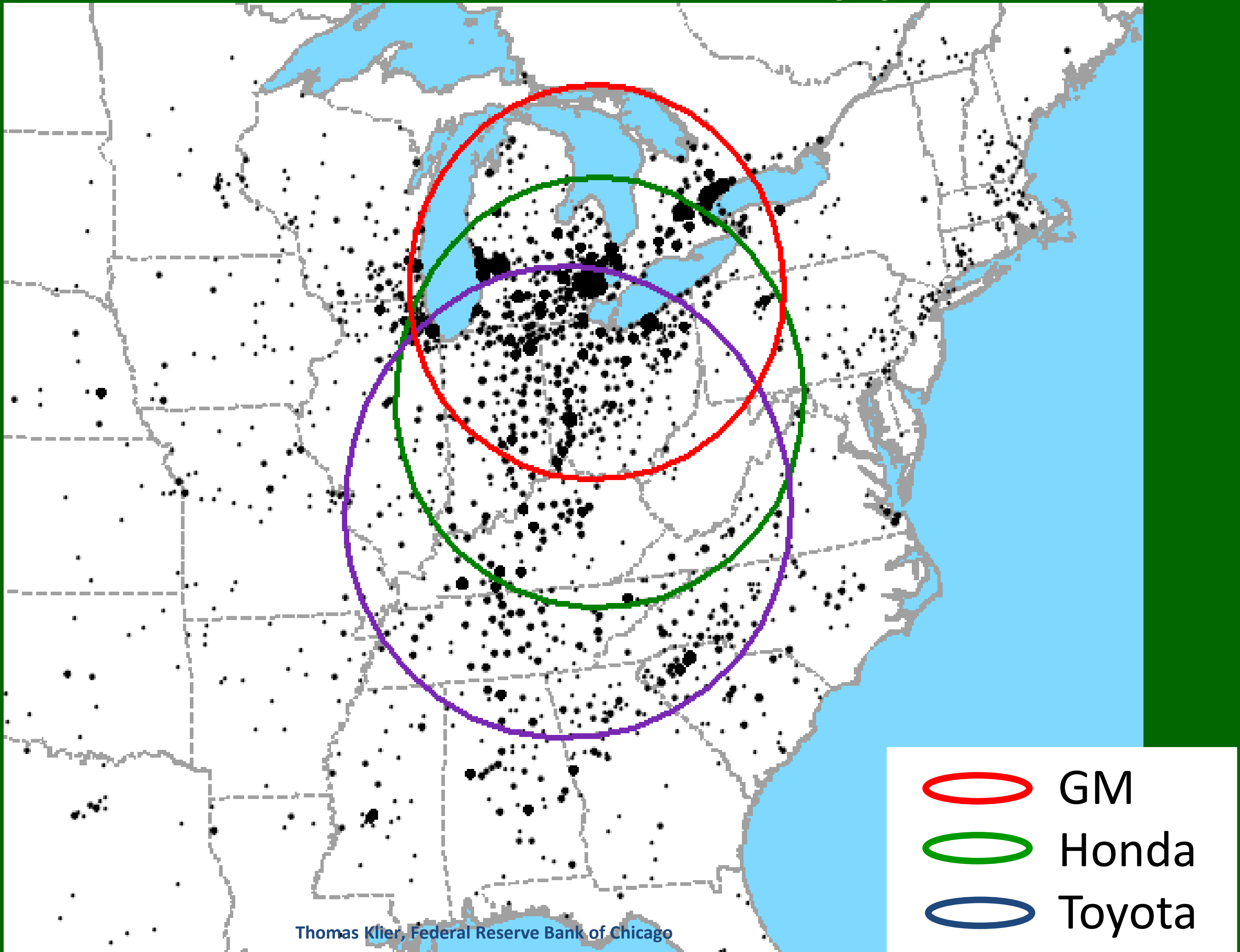
# Each carmaker has a network of suppliers around its assembly plants

## Toyota’s supplier network




Thomas Klier, Federal Reserve Bank of Chicago

# Supply networks overlap
## Median distance of suppliers



# Summary
# Key supply base changes 2006-09

- Modest reduction in plant count, much less than employment decline
- Closure rate relatively high for interior parts plants, lower for generic
- Continued strengthening of Auto Alley, especially Southern end

# Summary: Key Interdependencies

- Most suppliers to international carmakers also supply Detroit 3
- Networks of suppliers around assembly plants overlap

# Supply base – Size and Interdependency

James M. Rubenstein

Department of Geography

Miami University

Oxford Ohio 45056

rubensjm@muohio.edu

After the Perfect Storm
COMPETITIVE FORCES SHAPING THE AUTO INDUSTRY
May 10-11, 2010