Midwest Manufacturing Matters

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REAL
Introduction

- Review role of manufacturing in the Midwest
- Evaluate recent trends
  - Focus on changes in firm organization
  - Role and impact of interregional and international trade
- Examine prospects
What we Thought had Happened

- Erosion of jobs in 1970s through 1990s was end of the major structural reorganization and shake out
- No sucking sound from NAFTA
- Shift away from defense spending favored Midwest
- Manufacturing employment increased in early 1990s
What we Thought had Happened: Illinois

- Dramatic loss of employment in manufacturing 1970-1993 (decline by almost 40%)
- Phenomenal increase in productivity (80%)
- But….production increased by 20%
- We produced more with much less labor
Manufacturing Changes in Chicago: Indexed to 1970=100

Productivity

Production (value of Goods & Services)

Employment
What we Thought had Happened

- Prospects for the Midwest looked encouraging
- But then, we looked at the data......
What we Thought had Happened: Total Non Farm Employment

- Illinois, Rest of the Midwest (IN, WI, OH, MI, MO) and US moved in similar fashion through 1995
- Rest of Midwest and US continued to match each others growth rates for the next two years while Illinois slowed
- By 2001, Illinois' growth rate was 3 percentage points lower than Rest of Midwest and 7 point lower than US
- All tracked together post 2001
And then we come to Manufacturing Employment............

- REAL’s long-term forecasts in mid 1990s suggested continual erosion of manufacturing employment
- Steep decline through 1992 (loss 8% of 1990 base employment in manufacturing compared to 4% in US)
- Recovery through mid 1998 (parallel rate with Rest of Midwest) but lower than US
And then we come to Manufacturing Employment………..

- Decline thereafter – ahead of RMW for 2 years then parallel decline
- US decline began in 2001
- Mid 2003 employment levels down 21% (Illinois), 17% (RMW) and 12% (US) compared to 1990
- Rates of decline for the last two years similar in IL, RMW and US
## Summary Scoreboard

<table>
<thead>
<tr>
<th>Sector</th>
<th>Comparison to MW</th>
<th>Comparison to US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>+/-</td>
<td>-</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Trade, Trans. &amp; Utilities</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Information</td>
<td>+</td>
<td>+/-</td>
</tr>
<tr>
<td>Prof. &amp; Bus. Services</td>
<td>+/-</td>
<td>+/-</td>
</tr>
<tr>
<td>Financial Services</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Education and Health</td>
<td>+/-</td>
<td>-</td>
</tr>
<tr>
<td>Leisure and Hospitality</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Other Services</td>
<td>+/-</td>
<td>+/-</td>
</tr>
<tr>
<td>Government</td>
<td>+/-</td>
<td>+/-</td>
</tr>
</tbody>
</table>
Benchmark analysis

- Decomposing the growth into three different parts:
  \[ g_i = G + (G_i - G) + (g_i - G_i) \]
- Where
  \[ g_i = \text{Illinois growth of sector } i \]
  \[ G_i = \text{Benchmark’s growth of sector } i \]
  \[ G = \text{Benchmark’s growth for all sectors} \]
- Two benchmarks: US and Midwest employment growth
- Focus on \((g_i - G_i)\) difference between growth in IL and MW or US
Total NonFarm Employment

- **Positive** – Illinois grew faster than the benchmark
- **Negative** – Illinois grew slower than benchmark
Manufacturing Employment

Positive – Illinois grew faster than the benchmark

Negative – Illinois grew slower than benchmark
How did the Growth/Decline Experience in Manufacturing compare with All Sectors?

- $(Gi - G)$ is called industry-mix effect, showing how sector $i$, at the national level, fares with the overall sectors as a whole.
- Positive (negative) industry-mix effect means that the sector grows higher (slower) than the economy as a whole.
Manufacturing Growth – Comparison to all Sectors’ Growth
What if Illinois had the Same Structure as RMW or US?

- IL graph shows the Illinois actual number of employment in the sector and changes.
- MW graph shows Illinois employment in the sector, if IL had the Midwest structure and rate of growth.
- US graph shows Illinois employment in the sector, if IL had the US structure and rate of growth.
Manufacturing Growth Rates with RMW and US Structure

[Graph showing trends in manufacturing growth rates from 1991 to 2003 for National, Midwest, and IL categories.]
Summary of Comparisons

- Illinois economy transformed over last 30 years – less dependent on Manufacturing than RMW but still more dependent than US as a whole
- Recent trends suggest slowing of decline but……
- Illinois’ manufacturing integrated with RMW
Hollowing Out - Revisited

- Data extracted from our Chicago models revealed a hollowing out process in the metropolitan economy.
- Typical establishment was
  - Buying less
  - Selling less
within the region’s economy.
The graph shows the trend of Value of Production ($000,000), Constant 1992 Dollars from 1975 to 2011. The key observations are:

- **Total Intermediation** (red line) shows a steady increase over time.
- **Total Sectoral Outputs** (green line) also shows a positive trend, significantly higher than Total Intermediation.

The graph highlights the gap between Local Production and Local Supplies, which is increasing over time. This gap is visually indicated by arrows pointing upwards, drawing attention to the increasing divergence between these two measures over the years.
Implications

- Ripple effect smaller – especially from manufacturing sectors
- But….greater dependence on inputs and markets in the rest of the Midwest
- Transportation de-regulation resulted in significant decrease in costs of shipment
- Reorganization of production systems and value chains
Vertical-Specialization Based Trade (after Hummels et al., 1998)

Feedback Loop Analysis

Region 1

Manufacturing Imports

Region 2

Components → Manufacturing Production → Labor/Capital → Primary

Secondary Feedback Loop

Region 3

Manufacturing Exports

Primary Feedback Loop

Manufacturing Imports → Manufacturing Production → Services

Manufacturing Exports
But the Economies are Becoming More Alike

- With few exceptions, distribution of activity similar across Midwest
Shares of State GSP By 2-Digit Industry
Implications

- Firms are reorganizing production
  - Exploiting scale economies in individual establishments
  - Specializing within establishments
  - Trading across state lines
  - Agglomeration/cluster effects realized at level of Midwest
Implications

- Trade concentrated in *intra-industry trade* – movement between one firm and another in the same sector
What we Trade is Part of a Value Chain of Production - Cluster
Implications

- Changes in one sector in one state in the Midwest have significant ripple effects on other states.

- Loss of employment in manufacturing in any state likely to unravel activity somewhere in the rest of the Midwest.
## Impact of $1 million in Auto Production

<table>
<thead>
<tr>
<th>State</th>
<th>Michigan</th>
<th>Percentage of Indirect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois</td>
<td>$40,000</td>
<td>10%</td>
</tr>
<tr>
<td>Indiana</td>
<td>$40,000</td>
<td>10%</td>
</tr>
<tr>
<td>Michigan</td>
<td>$1,520,000</td>
<td></td>
</tr>
<tr>
<td>Ohio</td>
<td>$60,000</td>
<td>15%</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>$20,000</td>
<td>5%</td>
</tr>
<tr>
<td>Midwest Total</td>
<td>$140,000</td>
<td>40%</td>
</tr>
<tr>
<td>RUS</td>
<td>$240,000</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>$1,950,000</td>
<td></td>
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</tbody>
</table>
While interregional trade still dominates international trade in the Midwest, increasing percentage of the state-to-state flows are part of value chain associated with exported goods and services.

According to FRBNY study loss of jobs in this cycle unlikely to be replaced.
Summary Interpretation

- Job losses combination of many factors
  - Productivity improvements
  - Competitive advantages of East Asian economies
  - Steel prices
  - Currency exchange rates
Summary Interpretation

- Policy implications?
  - Intervention
    - conflict with free trade ideals
    - Fiscal wars zero sum game
  - Labor force training
  - Infrastructure
  - Adoption of energy renewable and energy efficiency programs – significant job creation and reduction of dependence on imported oil
Summary Interpretation

- **Policy implications?**
  - Adoption of energy renewable and energy efficiency programs –
  - Significant job creation and reduction of dependence on imported oil
  - Increase efficiency of US business