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Charting an Economic Development Strategy for Industrial Regions: The Story of the U.S. Midwest in the 1990s and Beyond

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Abstract: The industrial Midwest went through wrenching economic restructuring during the 1970s and 1980s and yet rebounded to outperform the U.S. economy during much of the 1990s. Key to this resurgence was restructuring in core industries (including manufacturing) that increased the productivity and competitiveness of the region. This paper will examine the nature of the restructuring and what strategies and developments help explain this regional recovery.

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Charting an Economic Development Strategy for Industrial Regions: The Story of the U.S. Midwest in the 1990s and Beyond

Richard Mattoon

Can a fading industrial region regain its competitive edge? That was the question many policymakers were asking in the industrial Midwest at the beginning of the 1990s. For much of the twentieth century, the Midwestern region of the United States had served as the heart of the American economy. Home for much of the nation's heavy industry, the region produced steel, autos and machinery for domestic and world consumption. However, beginning in the 1970s and lasting through much of the 1980s, a series of national recessions created a sharp reversal of fortune for the region. Manufacturing costs rose and world competition left the region shedding both jobs and firms. Michigan, home to the domestic auto industry, saw unemployment hit 16.9% by November 1982.[1] The steel industry shuttered mill after mill in Indiana and Illinois. It was during this time that the region became saddled with the moniker of "rustbelt."

However, during the 1990s the region's fortunes reversed. In fact, the region actually led the nation out of the 1990-91 recession and, by the mid 1990s, recovery was evident from record low unemployment rates and increased industrial productivity. As this paper will show, a combination of luck and timing as well as appropriate public policy helped return the luster of the Midwest.[2] In this paper, I will identify those factors

[1] http://www.bls.gov/web/lauhsthl.htm. All of the states in the region recorded their highest unemployment rates since 1976 during this period. Illinois peaked at 12.9% in February 1983, Iowa hit 8.5% by May 1983, Indiana peaked at 12.8% in November 1982 and Wisconsin hit 11.8% by January 1983.

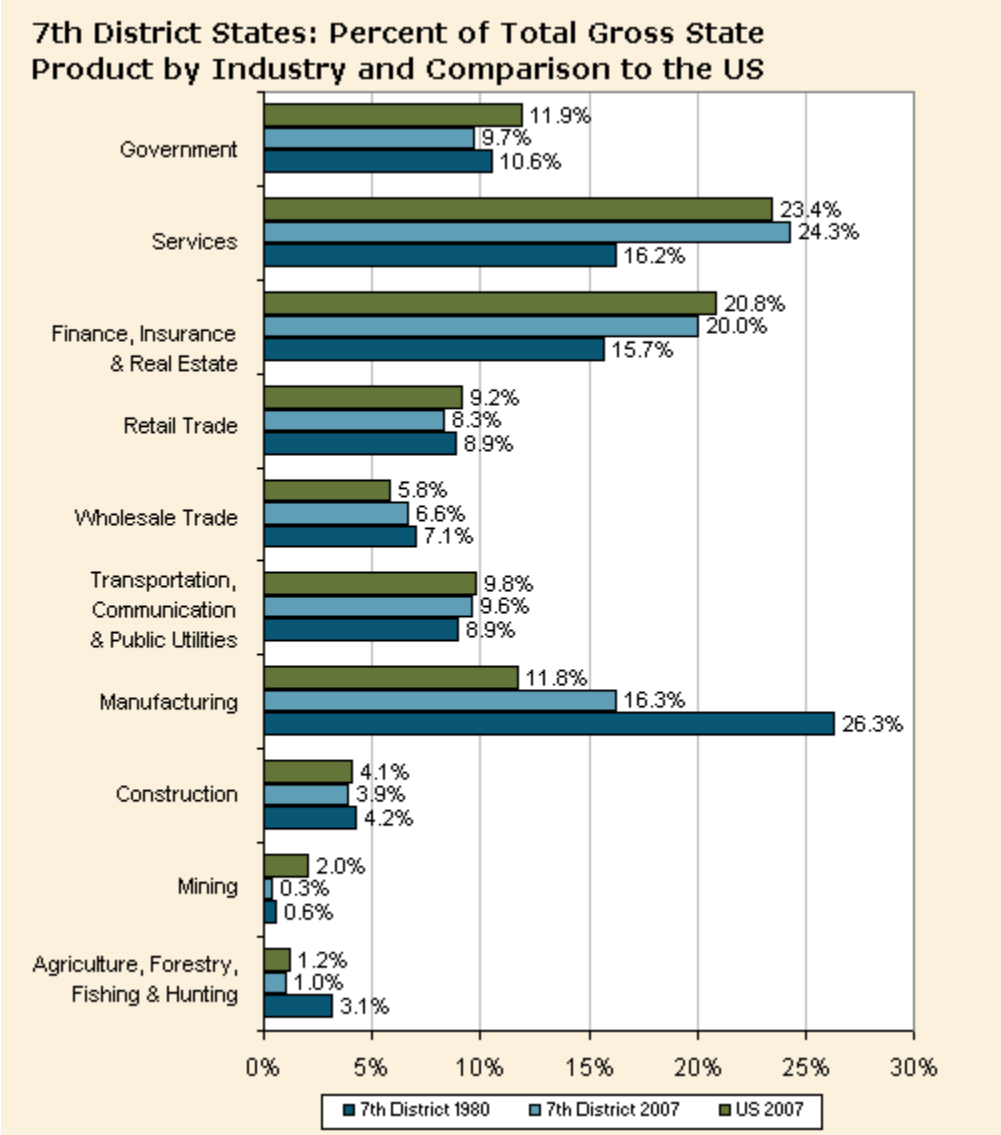
[2] For a thorough discussion of changes in the structure of the Midwest economy and the region's manufacturing industries, see two studies by the Federal Reserve Bank of Chicago: 1) "Assessing the Midwest Economy" http://www.chicagofed.org/news_and_conferences/conferences_and_events/assessing_the_midwest_economy.cfm, and 2) "Midwest Manufacturing Project" http://www.chicagofed.org/news_and_conferences/conferences_and_events/midwest_manufacturing_project.cfm.

that led to regional recovery and what lessons can be learned from economic change in a mature industrial region.

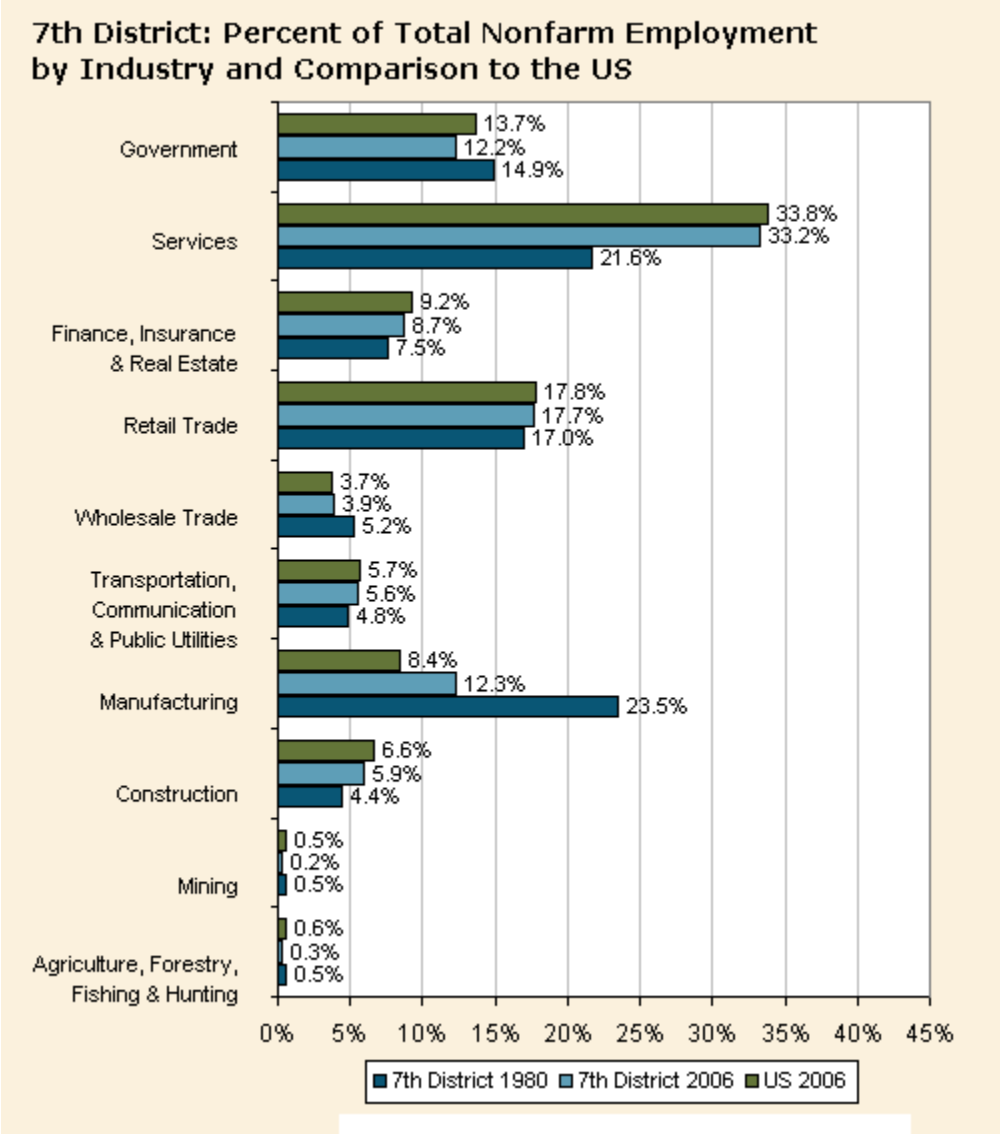
Understanding the Industrial Structure of the Region

For the purposes of this paper, the Midwest is defined by the five states that make up the Seventh Federal Reserve District—Illinois, Indiana, Iowa, Michigan and Wisconsin. This is not a perfect definition as most studies of the industrial Midwest would include Ohio and western New York as well as western Pennsylvania. However, for the purposes of this paper, these five states can serve as a rough proxy for the Midwest economy. As is illustrated in the following charts, this region has gone through considerable restructuring both in terms of industry structure and employment. This first chart provides a comparison of industry shares of gross product in 1980 and 2007 with a comparison to the U.S. average for 2007.[3] As the figure shows growth in the contribution of services and finance, insurance and real estate to total gross domestic product (GDP) grew rapidly over this period. While manufacturing declined significantly, it still held a share in 2007 that was significantly above the U.S. average (16.3% vs. 11.8%).

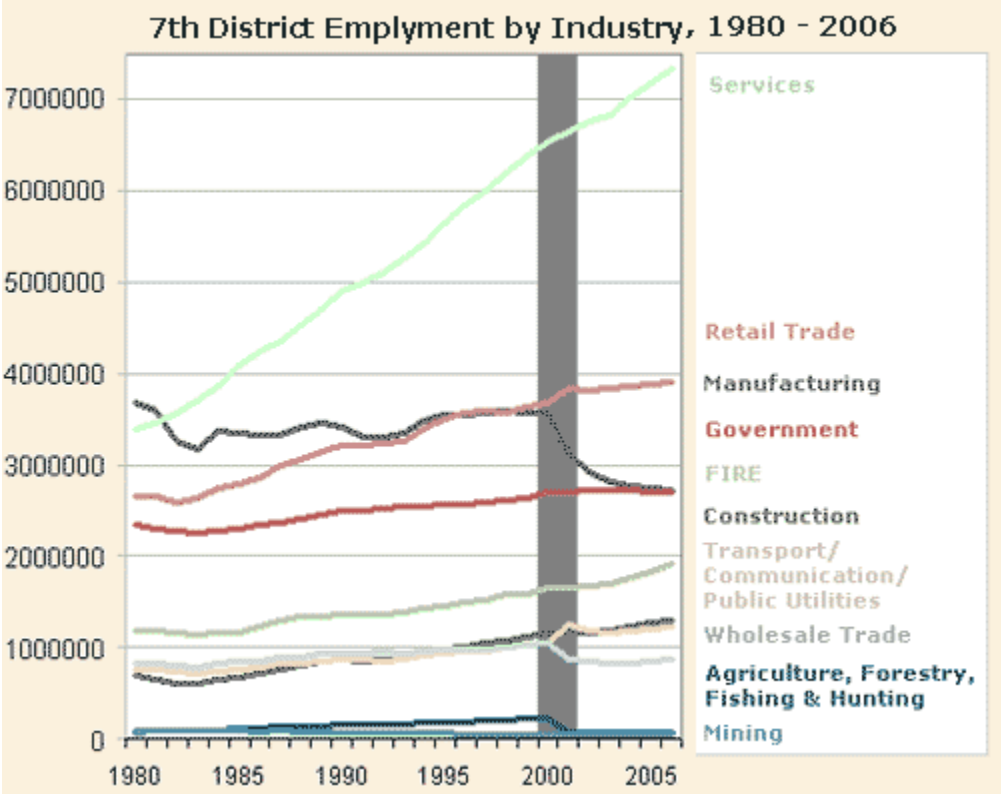
[3] All figures are available at http://www.chicagofed.org/economic_research_and_data/midwest_economy_data.cfm



Given the changing industry contribution to GDP in the region, it is not surprising to find that employment shares have also changed dramatically. By 2006, services accounted for more than a third of total regional employment while manufacturing had fallen from roughly one quarter to 12.3% of employment. This still was significantly above the U.S. average but again suggests significant restructuring over this 27 year period.

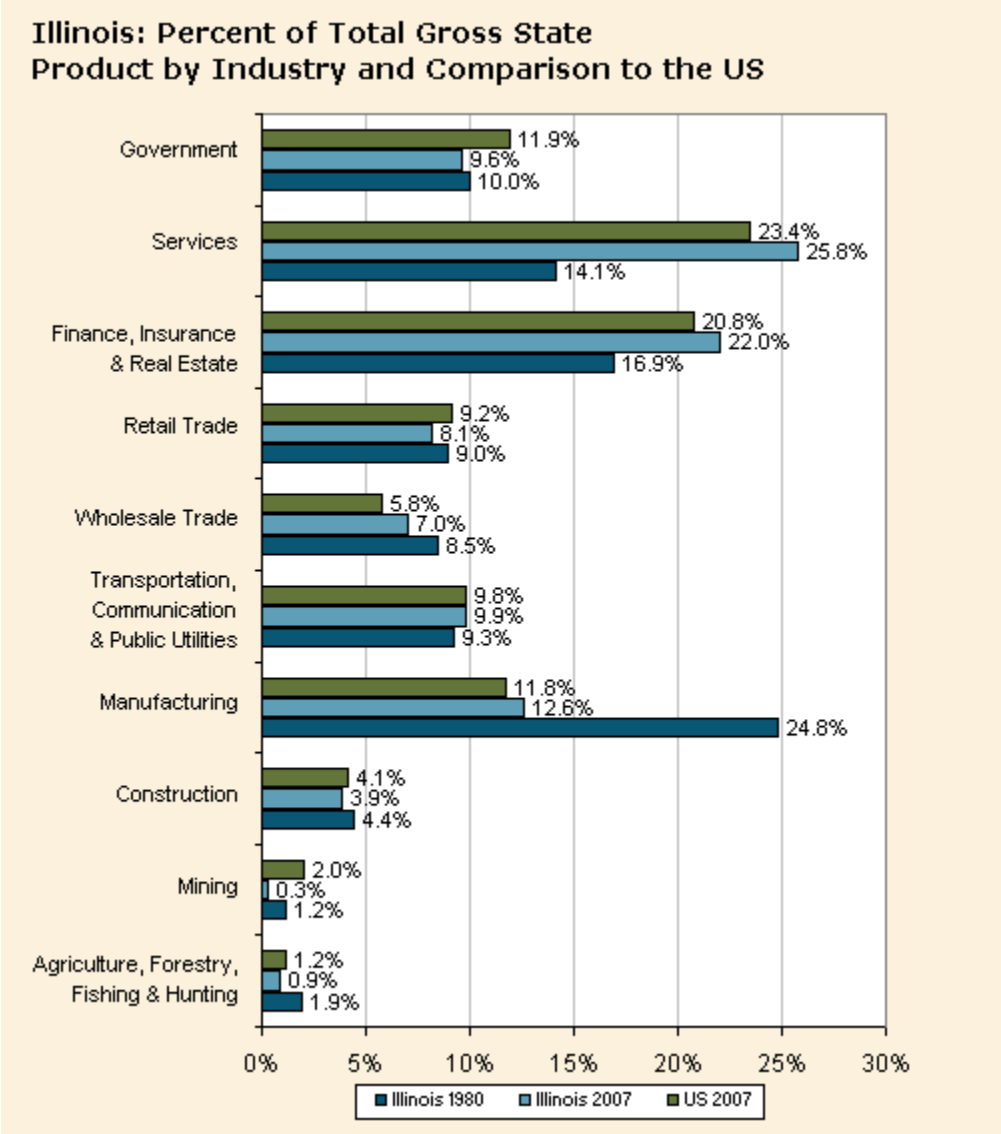


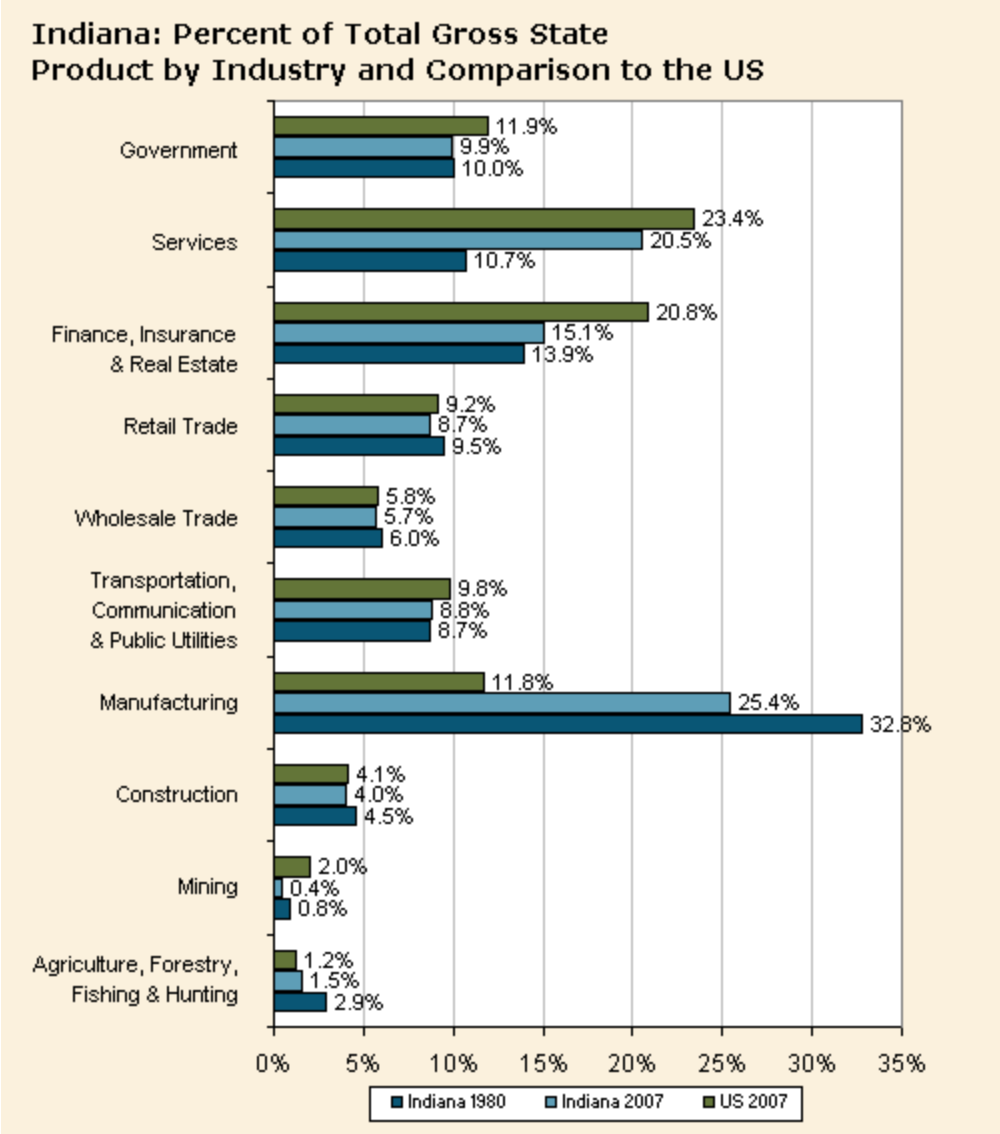
An even clearer picture of the path of this restructuring can be seen in this time series chart. As it illustrates, service job growth has been explosive. Similarly, retail trade jobs have shown impressive growth. Manufacturing shows a sharp decline in the early 1980s followed by stable and eventually improving performance in the 1990s. What is equally apparent is that the sharpest employment decline has been associated with the timing of the 2001 recession, which has been widely portrayed as a manufacturing led recession that has had a particular impact on the domestic auto and auto supplier industries.



Contrasting Economic change in two Midwestern states—Illinois and Indiana

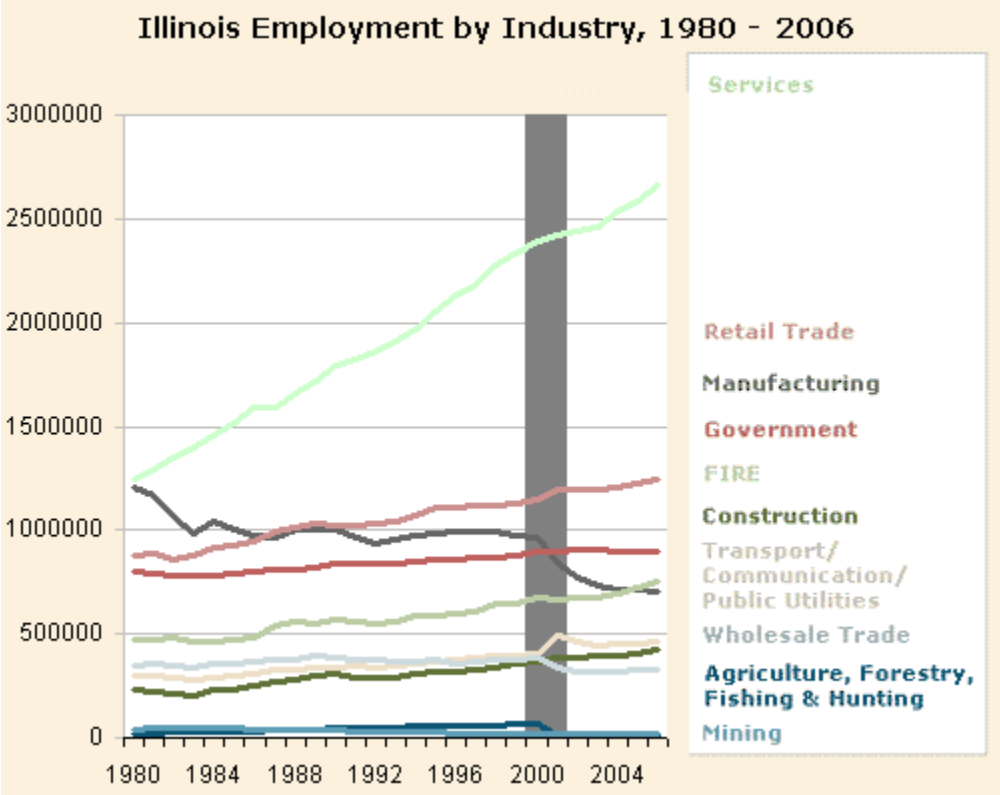
While the Midwest is traditionally seen as having a manufacturing heritage, there are important differences in how states have responded to economic change. As the following figures attest, Illinois was quicker to shed manufacturing as its dominant city—Chicago—rapidly restructured to promote growth in professional services and tourism. In contrast, Indiana has emerged as the most manufacturing intensive state in the country. By 2007, the Illinois economy (when measured by industry shares of GDP) looks almost identical to the U.S. as a whole. Indiana in contrast has 25% of GDP from the manufacturing sector and has a relatively small finance, insurance and real estate sector.

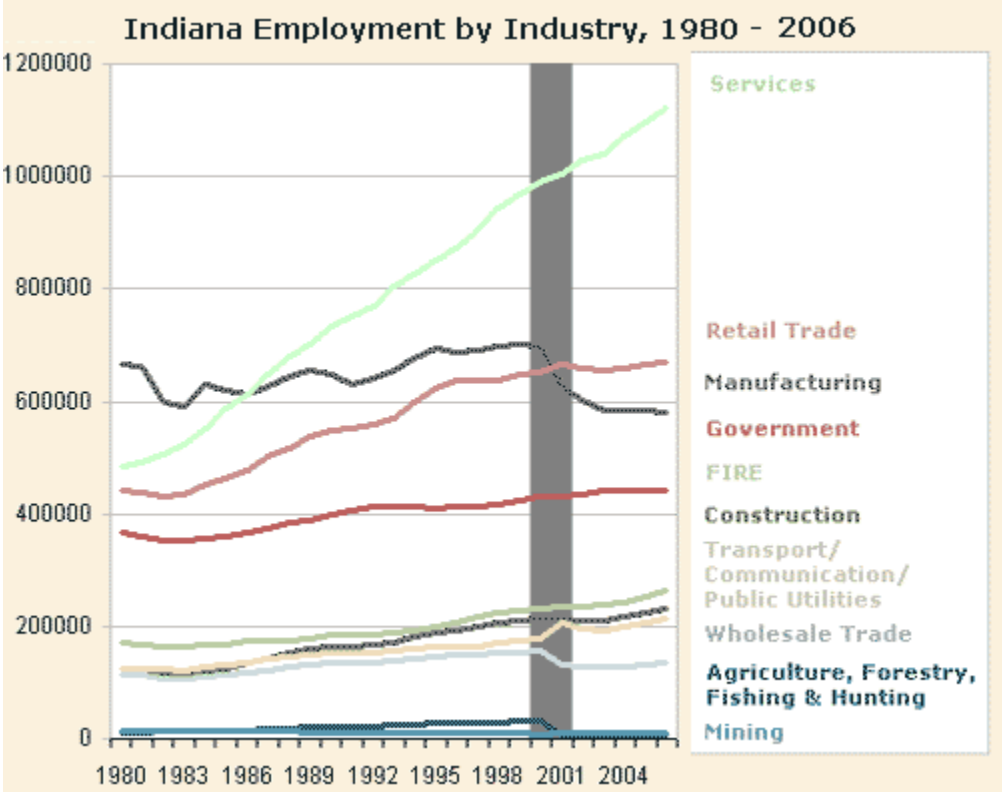

Illinois: Percent of Total Gross State Product by Industry and Comparison to the US
Government
11.9%
9.6%
10.0%
Services
23.4%
25.8%
14.1%
Finance, Insurance & Real Estate
20.8%
22.0%
16.9%
Retail Trade
9.2%
8.1%
9.0%
Wholesale Trade
5.8%
7.0%
8.5%
Transportation, Communication & Public Utilities
9.8%
9.9%
9.3%
Manufacturing
11.8%
12.6%
24.8%
Construction
4.1%
3.9%
4.4%
Mining
2.0%
0.3%
1.2%
Agriculture, Forestry, Fishing & Hunting
1.2%
0.9%
1.9%
0%
5%
10%
15%
20%
25%
30%
Illinois 1980
Illinois 2007
US 2007



Perhaps more telling in terms of the pace of restructuring is the employment trend over time. While both states consistently added service jobs at a rapid clip, Indiana either held steady or increased its number of manufacturing jobs up until the 2001 recession, when sharp declines kicked in particularly related to cuts in auto and auto supplier firms. Still, while the manufacturing sector in Illinois had dropped to fifth place in terms of the size of its share of total state employment, in Indiana manufacturing held the third employment position. By 2006, Indiana still had nearly 16% of its employment in manufacturing. However, the decline in employment in part reflects the restructuring of

manufacturing industries that includes the reclassification of jobs into service firms (e.g., human resources is contracted out to a human resource firm rather than being handled internally), increased use of automation that reduces the number of employees needed to produce the same or larger level of product and a move toward a higher-value-added product mix.





Why did the region revive in the 1990s?

During the period 1979-1983, the Midwest lost 20 percent of its manufacturing workforce. Compounding this failure was a sharp decline in agricultural employment and farm prices that was the worst since World War II. While the region stabilized during the mid 1980s, it was not until 1987 that the Midwest began to show expansion in capital goods and exports. A decline in the value of the dollar also helped. Ironically, this period of decline in economic health helped position the region for future growth. Noted economist Joseph Schumpeter would have likened this time to "creative destruction." The shakeout of the early 1980s destroyed a large portion of inefficient capital stock. The remaining stock was more efficient and productive and would help bolster future growth. However, this improvement in the efficiency of the capital stock is

insufficient to fully explain the nature of recovery. Additional factors ranged from changes in the geography of the auto industry to changes in public sector policies that will be described in the next section.

Factors that influenced the turnaround—external and internal

Changing geography of the auto industry [4]

Historically auto assembly plants had concentrated in the Midwest for two reasons. First the industry had been born in Detroit and this gave it historic roots in the region. Second, the central geographic location of the region provided auto producers with excellent market access. In the 1980-1990s, a change in the production process encouraged further concentration of auto suppliers in the region. The advent of Just in Time (JIT) inventory management encouraged many suppliers to locate closer to final assembly plants in order to ensure same day delivery of auto parts to the assembly plants. Another change in industry strategy that benefited the region was the rapid expansion in the number of car models offered. The number of different car and truck models sold in the U.S. increased from 30 in 1955 to 241 by 1995. With reduced output per individual model, it became most efficient to produce all of the output at a single plant and then distribute the model from a central geographic location (the Midwest). As a result, car firms closed coastal plants during this period and concentrated production in the center of the country.

[4] For a thorough review of this restructuring see Thomas Klier (2000), "Structural Change and Cyclicality in the Auto Industry," *Chicago Fed Letter*, No. 159, November. http://www.chicagofed.org/publications/fedletter/2000/cflnov2000_159.pdf

Federal spending patterns

Traditionally the Midwest does poorly in terms of receiving money from Washington. A significant portion of federal dollars sent to the states is in the form of national defense spending both for military bases and military equipment production. Given that the region has concentrations of neither of these facilities, it is not surprising that in the 1990s Midwest percentage of U.S. spending per capita on a variety of federal programs was below the national average.

Table 1. Per Capita Federal Spending as a Percent of U.S. Per Capita Levels by Category

	Grants	Salaries/Wages	Direct Payments	All Functions
Illinois	95	78	97	87
Indiana	72	59	92	80
Iowa	86	56	101	92
Michigan	94	51	100	83
Wisconsin	86	46	92	78

Source: Kerry Sutten, "Federal Spending in the Northeast and Midwest: Fiscal 1995." Northeast-Midwest Institute, Washington, D.C. June 1996.

However, this seeming disadvantage turned to an advantage in the late 1980s and early 1990s. Following a buildup in defense spending under the Reagan administration, federal policy moved toward a defense build down following the fall of the Soviet Union. In response, both procurement and bases were cut significantly and the impact on regions with concentrations in these areas was significant. The fact that the Midwest did not have

high concentrations in these areas cushioned it from an external shock felt by much of the rest of the nation from this change in the composition of federal spending.

Energy

Energy prices declined throughout the 1990s for everything from coal to natural gas to motor fuel. Given the industrial base of the region, Midwestern states are heavy energy consumers making energy an important input price in production. In addition, as a key logistics center, energy prices impact transportation and distribution costs. The decline in energy costs clearly benefited the region. In particular the decline in motor fuel prices helped the domestic auto industry since it boosted demand for their most profitable product—trucks and sports utility vehicles.

Exports

The 1990s saw a rapid run up in the share of GDP generated from exports and the manufacturing base of the region was well positioned to benefit. In particular capital goods industries such as electrical and nonelectrical machinery and equipment saw export sales boom. In addition, demand in developing nations for construction, agricultural equipment and telecommunications have all benefited the region which has high concentrations of these firms. Part of this success has been related to currency swings as the dollar depreciated following a peak in 1985. However, during this period the decline in the dollar is not a persuasive argument for explaining export growth. In fact, research demonstrates that in terms of the major trading partners of Midwestern firms (Canada and Mexico in particular), the dollar actually appreciated during this period.[5] This suggests

[5] See Jack L. Hervey and William A. Strauss, 1996, "A Regional Export Weighted Dollar: A Different Way of Looking at Exchange Rate Changes" Federal Reserve Bank of Chicago, September. http://www.chicagofed.org/news_and_conferences/conferences_and_events/files/1996_global_linkages_to_the_midwest_economy_hervey.pdf.

that the gains in exports were more robust and perhaps caused by demand for the Midwest regionally produced product and not simply because of a lower price.

Internal factors that influenced performance

Technology and organization

One of the primary factors explaining the region's recovery in the 1990s was the application of technology and changes in industrial organization. In reviewing the period, it becomes apparent that success was not driven by spawning whole new industries such as biotechnology or other high technology firms. Rather, it was the application of technology in existing industries that led to productivity gains that made firms more competitive. In short, the region became smarter at making what it traditionally had made. The 1990s saw widespread application of lean manufacturing technologies that had been introduced in the 1980s. Lean manufacturing combined aspects of craft and mass production ranging from teamwork on the shop floor and emphasis on low inventories and flexible production equipment, to closer relationships with suppliers. This use of advance technology is demonstrated by U.S. Census surveys during the period (Table 2).

Table 2. Application of Some Advanced Technologies (percent of plants using)

	FMC/FMS*	**CAD/CAE****	**Interco. Netwk*****
Plant Employment			
20-99	7.6	49.5	12.0
100-499	21.4	75.4	28.4
500+	40.4	87.2	47.1

Age of Plant			
Under 5 years	13.4	63.5	15.0
5-15	13.3	62.0	18.0
16-30	13.4	64.4	20.5
Over 30	15.2	63.1	22.0
Major Industrial Groups			
Fabricated Metal	9.5	46.5	16.7
Industrial Machinery and Equipment	11.8	64.1	15.4
Electronic & Other Electric Equipment	17.0	64.2	21.9
Transportation equipment	15.5	53.9	23.4
Instruments and Related Products	14.2	65.5	15.3

Note: The table reports information on three of the 17 advanced manufacturing technologies surveyed. They are defined as follows:
**Flexible manufacturing cells and systems* (FMC/FMS): two or more machines with automated material handling capabilities controlled by computers or programmable controllers, capable of single/multiple path acceptance of raw material and single/multiple path delivery of finished product.
***Computer aided design and engineering* (CAD/CAE): use of computers for drawing and designing parts or products and for analysis and testing of designed parts or products.
****Intercompany computer network* (Interco. Netwk): use of network technology to link subcontractors, suppliers, and/or customers with the plant.
Source: U.S. Department Of Commerce, Bureau of the Census, *Current Industrial Reports*: *Manufacturing Technology: Prevalence and Plans for Use*, 1994, tables 4D, 4E.

In addition, another change was the increase in the additional value of the product. Midwest manufacturers did this along two dimensions. First, firms moved up

the value-added chain in terms of the final product produced. Steel provides a good example. As traditional large, flat rolled mills failed, new mini mills came into existence designed to produce specialty steel in flexible production runs. These incorporated both improved production efficiency and better technology with the ability to produce a specialized product that was less susceptible to price competition alone. The second strategy involved the embedding of services into manufactured products. More sophisticated products require service and technical support and manufacturing firms became adept at adding service contracts to their products. In many cases these service contracts produced larger revenues for firms than the sale of the original manufactured product.

Cost of business operations

A clear contributing factor to the region's revival was the fall in the cost of business operations. As previously mentioned, energy prices slumped over much of this period, benefiting the region. In addition, firms moved to improve conservation and reduce energy costs relative to production. By 1993, energy costs relative to gross product fell by better than 20%.

Firms also sought to bring labor costs more in line with the national average. The Midwest has always had a higher concentration of unionized labor and over time this translated to manufacturing wages that were considerably higher than the national average.

Table 3. Index of Relative Wages in Manufacturing: Midwest vs. U.S.

	1979	**1983**	**1988**	**1993**	**1995**
Illinois	1.09	1.10	1.07	1.03	1.02

Indiana	1.16	1.14	1.12	1.12	1.13
Iowa	1.16	1.14	1.03	1.04	1.03
Michigan	1.30	1.32	1.29	1.31	1.32
Wisconsin	1.09	1.11	1.03	1.04	1.03
Midwest	1.17	1.17	1.13	1.13	1.13

Source: Department of Labor, Bureau of Labor Statistics

Institutional capital

Often overlooked is the role of nonprofits organizations in supporting the economy. These organizations can include public-private partnerships and councils, nonprofit organizations composed of business leaders, public-private development councils, foundations, trade associations, chambers of commerce, extension oriented research centers at local universities and research institutes. Given its long run of prosperity for much of the 20th century, the region has a long list of such organizations that have acted to improve communication between private and public sector decision makers, as well as issuing research and analysis on key economic issues.

Sustaining the gains

In examining the recovery of the region's economy in the 1990s, it was clear that both timing and policy had a role in improving fortunes. In particular, it is obvious that a one size fits all approach to promoting regional economic health is not possible. In fact the best strategies might be termed "fertile soil" approaches. In essence, this suggests that where economic growth might occur is almost impossible to predict, so that the best

economic development strategy is one that creates the conditions for growth that will benefit almost any type of firm. The role for policy may seem limited but in fact it is critical even if it does not seem designed to favor direct interventions to support particular industries. In many ways, this is an explicit rejection of the concept of industrial policy that was debated in the 1970s and early 1980s. Such an approach recognizes that the ability to pick winners and losers in economic strategy is beyond the scope of most government agencies. Three broad policy themes can be identified to support a "fertile soil" policy structure:

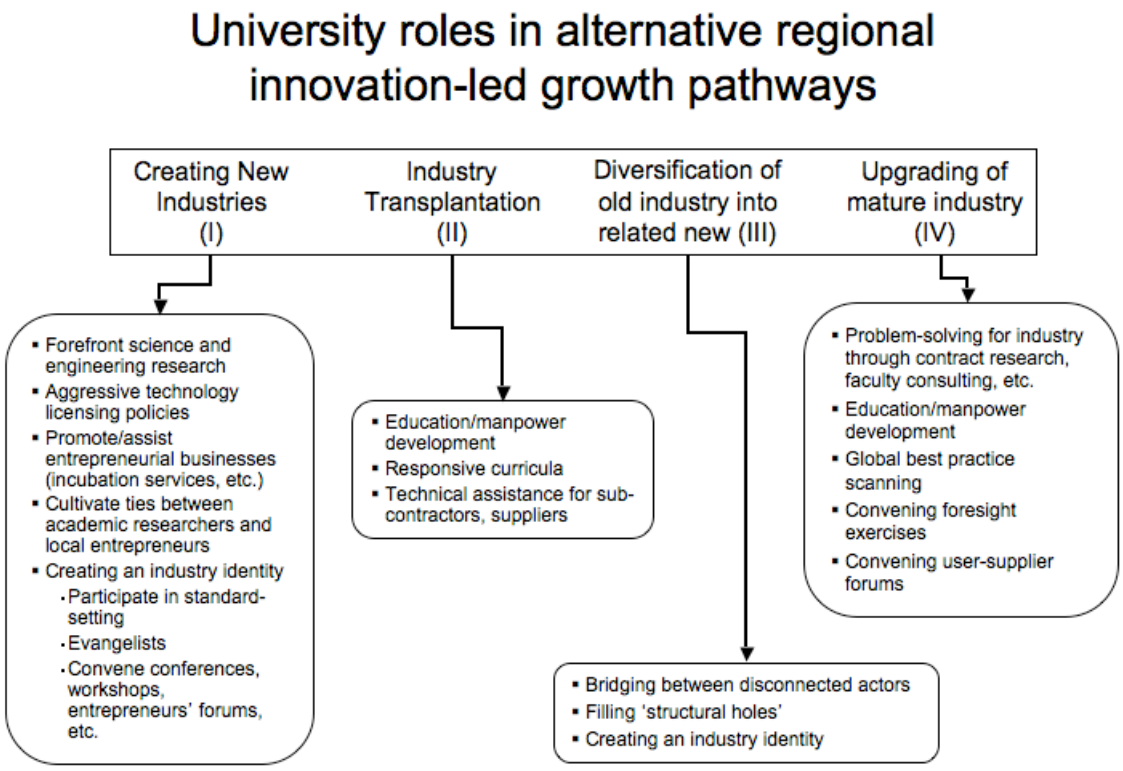
- An increased emphasis on education and work force training;
- A heightened attention to, and evaluation of, region specific policies;
- Understanding and adapting to changing industry restructuring, location and technology.

Education and workforce training

For developed nations, the quality of human capital has become an economic development imperative. As natural resource endowments and location have lost some of their value, the quality of the Midwest's human capital stock has become paramount. In particular, technology and information now add considerable value to goods, products and services. In turn, the economic returns to these factors have been heightened. Having appropriate human capital is critical to anchoring economic production in the region. With increased global trade and capital flows, both financial and physical mobility have increased. The best human capital helps ensure that technology and information intensive goods and services will be produced within the region.

Promoting such a strategy requires understanding what creates economic change and linking knowledge institutions to this. In particular, the roles of universities become critical to economic growth. Universities help create knowledge that can benefit local firms and have a fundamental role in producing a highly skilled workforce. Universities can be strategic partners at all levels of the economy.

To better understand the differing pathways available to universities consider the following typology developed by Lester (2005).[6]



Source: Richard Lester (2005)

[6] Lester, Richard K. (2005), "Universities, innovation, and the competitiveness of local economies: A summary report from the Local Innovation Systems Project—Phase 1," Massachusetts Institute of Technology, Industrial Performance Center, Local Innovation Systems Project, working paper, No. 05-010, December 13. http://web.mit.edu/lis/papers/LIS05-010.pdf.

In each case, the appropriate role for university support is driven by the type of economic transformation that the region is interested in promoting, ranging from creating new industries to increasing the productivity of a mature industry. In all cases, the universities role is to build the knowledge base of the local economy and to support the development of appropriate human capital. Lester believes that often the best university supported economic development comes when a university is highly attuned to the local economy and works to support the productivity of local industry. This transmission of academic knowledge into the local economic base allows for process innovation where even mature firms can stay competitive through the use of best practices. An example of this is the strategy used by the state of South Carolina in its efforts to support the growth of the auto industry in the state. With the arrival of BMW, the state's university system moved quickly to offer training at the community college level to ensure that the supply of skilled production workers would be adequate. In addition, with BMW's support, Clemson University has built an advance automotive engineering program and facility to conduct research. The objectives of such an approach are to ensure that BMW will be supplied with all of the local resources to succeed.

Developing appropriate regional policy

Regions and the amenities and attributes attached to them are increasingly becoming the unit of economies that determine where investment is made. As such, artificial barriers that try to steer investment based on arbitrary political/geographic barriers are inefficient. Successful economic development policy will promote regional growth that supports both international and cross state trade. Specifically, many economic development analysts have become focused on policies that integrate economic linkages. In the Midwest, some

have suggested that the creation of a "Euro-zone" type economic structure could improve the efficiency of the region's economy and help encourage investment. As it turns out, research suggests that the region's trade patterns are in fact highly integrated and might benefit from more coordinated regional policy.

Hewings (2004)[7] finds that trade between states located in the Midwest occurs at a significantly higher volume than international trade. The linkages across Midwest states suggests that all states in the region would benefit from reducing internal barriers to trade that can include trucking regulation, differential tax treatment and occupational licensing differences. For example, consider the trade pattern for the state of Illinois. As this illustrates, Ohio is Illinois largest "trading" partner and flows with other Midwestern states dwarf even the role of Canada.

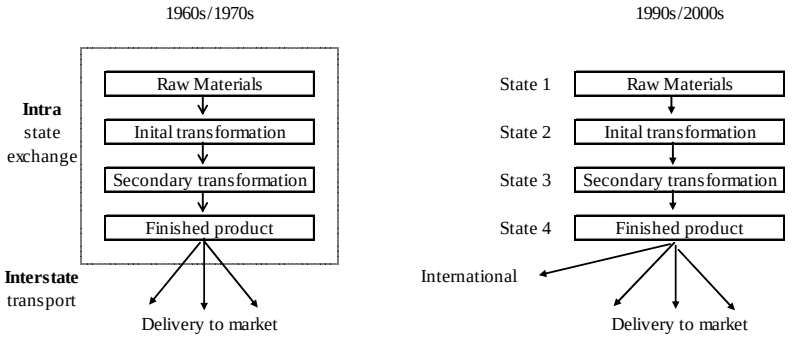
[7] See Geoffrey J.D. Hewings (2003), "Midwest Manufacturing Matters," Regional Economics Applications Laboratory, University of Illinois, October. http://www.chicagofed.org/news_and_conferences/conferences_and_events/files/midwest_manufacturing_at_crossroads_midwest_manufacturing_as_a_cluster.pdf.

***Intra*-regional transport dwarfs international flows** (Destination of largest exports)

	From Illinois to…
Canada	$6 billion
Japan	$2 billion
Mexico	$2 billion
UK	$1 billion
Germany	$1 billion
Ohio	$20 billion
Wisconsin	$18 billion
Indiana	$18 billion
Michigan	$18 billion
Source: Regional Economics App. Lab	

Hewings' research suggests that this relationship will only intensify given the changing structure of the manufacturing production process. As the following diagram illustrates, production in the 1960s and 1970s was characterized by tight integration often within a single state border. By the 1990s, final producers were more likely to seek suppliers with proximate locations (within one day's drive) but, in doing so, trade spread out across other state borders. As the stylized example suggests, today raw materials may come from one state, followed by initial transformation into a particular component in another state, before being shipped to a final state for final assembly. This increased regional integration while lessening the importance of state based policy.

Heightened transport has come about as the production process has broadened and less integrated



Changing industry structure, location and technology

Perhaps the most wrenching change to deal with in the economic restructuring of the region was the loss of manufacturing jobs in urban centers. Historically the location of manufacturing firms in cities had provided the urban middle class access to high quality jobs that did not require advanced education. Globalization made it apparent that many of these urban manufacturing firms faced a high cost structure and an antiquated infrastructure that made it unlikely that they could succeed against new global competition. In the urban areas that exhibited the best economic performance (Chicago, Minneapolis), manufacturing jobs were replaced with professional and technical service jobs as well as by the growth of a large personal service industry. The problem is that much of the existing urban population does not possess the skills that are needed to take these jobs. In addition the manufacturing that remains in urban areas has moved up the value-added chain and is more likely to employ fewer workers and require higher skills.

This choice of location in many ways reflects the ability to match the location with the appropriate labor force at the appropriate cost.

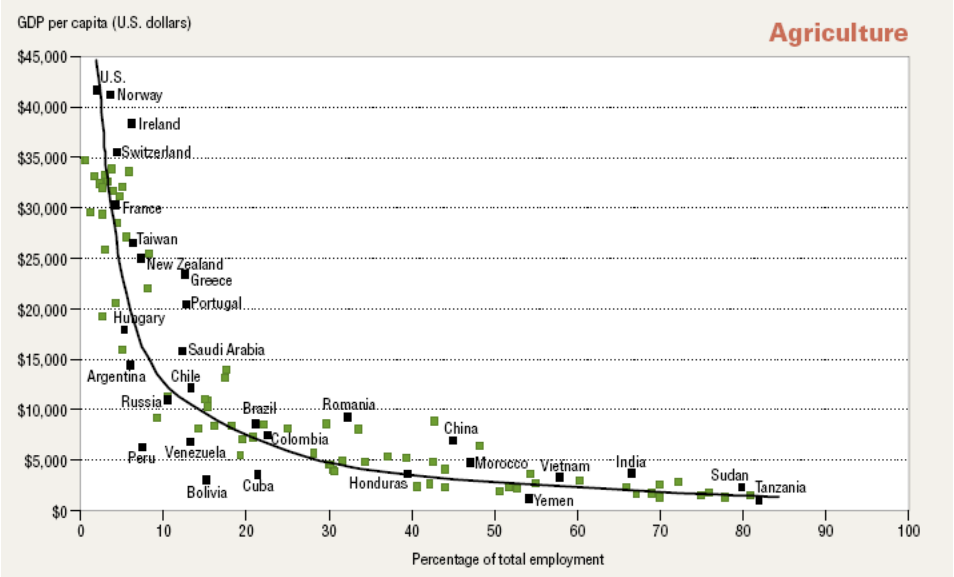
For governments, the challenge is to understand the factors that are critical to the health of differing industry segments and develop supportive policies. This can include workforce training, critical infrastructure and tax policy that does not place undue costs on capital and investment.

Appendix: Relationship between industry structure and wealth—an international comparison.

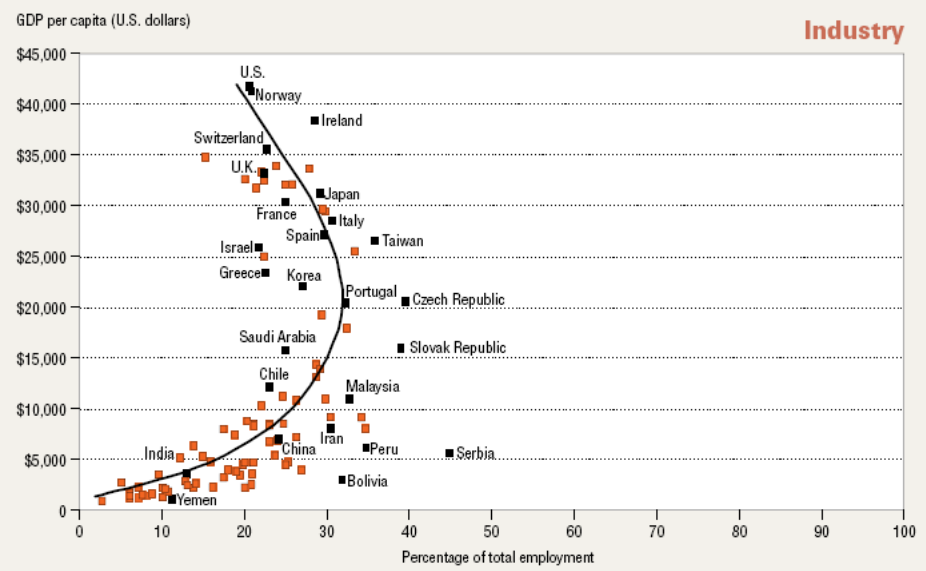
The following three charts help demonstrate the correlation between industry structure and per capita wealth.[8] What may be surprising is that in each industry group, the relationship between wealth and the share of jobs in a particular industry is remarkably tight regardless of the nation under consideration. Beginning with agriculture, there is an almost linear relationship that finds that the higher the percentage of workers holding agriculture jobs, the lower the per capita wealth. Manufacturing/industrial jobs show a more complex relationship. Initially an increasing concentration of manufacturing workers is associated with increased per capita wealth. However, this reaches an inflection point at around 30% of total employment. At that point, per capita wages increase as the share of manufacturing jobs declines. The third figure shows how these nations become wealthier through service jobs. When the percentage of service jobs in the economy exceeds 70%, the per capita wealth accelerates rapidly.

[8] Federal Reserve Bank of Dallas (2007), "Opportunity Knocks: Selling Our Services to the World," Annual report, http://dallasfed.org/fed/annual/2007/ar07.pdf.

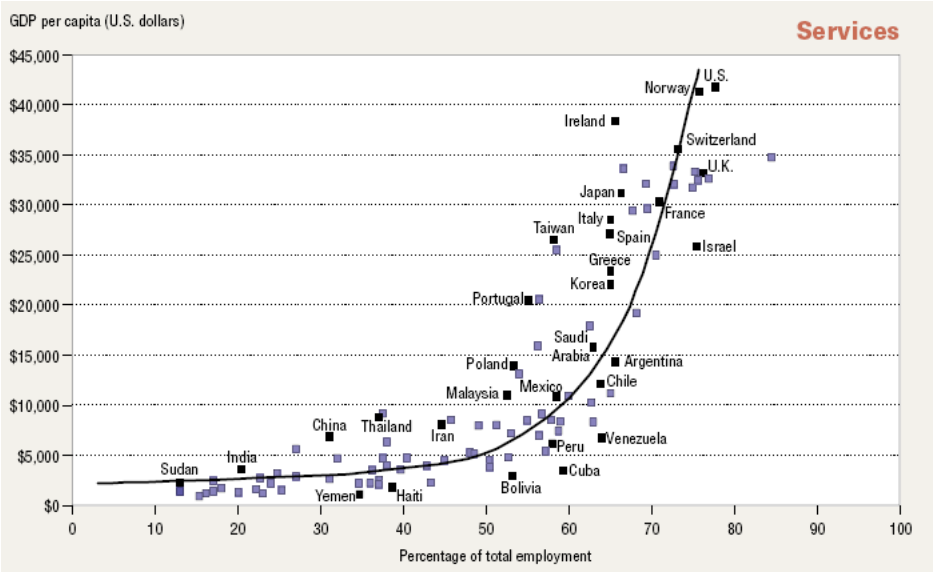
Agricultural employment and per capita wealth



Industrial employment and per capita wealth



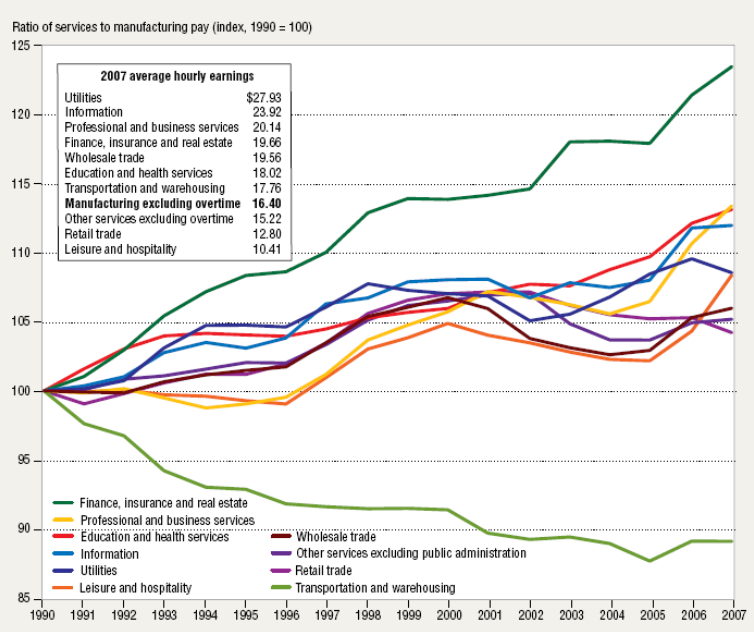
Service employment and per capita wealth



Source: 2007 Annual Report, Federal Reserve Bank of Dallas.

These figures suggest some interesting trends. Of course they simply correlate the industry structure with per capita wealth so it cannot be concluded that increasing service jobs necessarily leads to immediate gains in wealth. A more interesting exercise would examine specific occupations within each category to profile what jobs represent the highest value-add and translate to the highest wages. A simple example can be seen from the differential in U.S. wages across several industry categories. As the figure below illustrates, all service categories other than transportation and warehousing saw wages grow faster than manufacturing over this period.

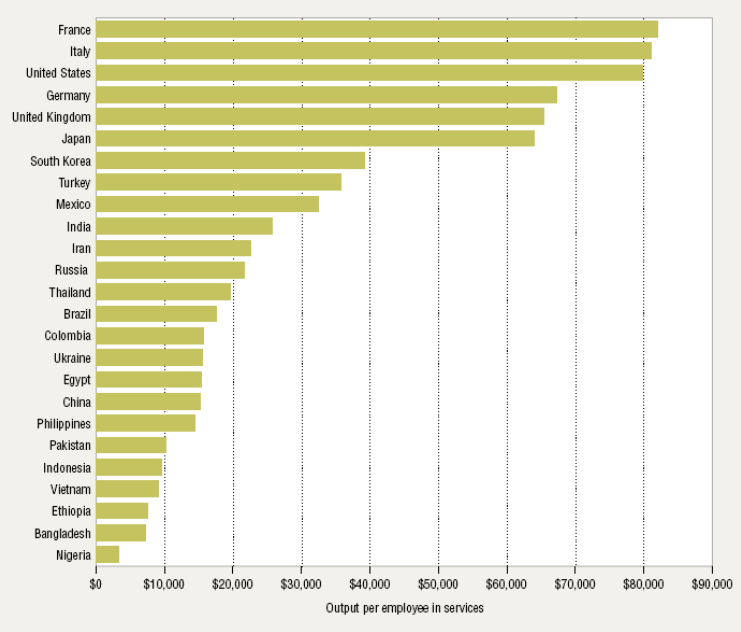
Trend in Service and Manufacturing Pay



Both Service and Goods Jobs Have Wide Variation in Pay

Service Sector Jobs 2006 average hourly wage		Goods Sector Jobs 2006 average hourly wage	
Surgeons	$88.53		
Dentists	67.76		
Lawyers	54.65		
Financial managers	48.77	Petroleum engineers	$48.86
Computer software engineers	39.42	Industrial production managers	40.37
Computer programmers	33.42	Mechanical engineers	34.89
Accountants and auditors	29.17	Elevator installers	29.78
Interior designers	23.08	Building inspectors	23.37
Truck drivers	17.46	Carpenters	19.20
Telephone operators	15.73	Roofers	16.99
Retail salespeople	11.51	Filling machine operators	12.02
Taxi drivers and chauffeurs	10.62	Sewing machine operators	9.78
Maids, house cleaners	8.99		
Fast-food cooks	7.67		

Service Output Per Worker Varies From Nation to Nation



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