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Minimum Wage Impacts on Employment:
A Look at Indiana, Illinois, and
Surrounding Midwestern States

Shifting Gears:
Recent Changes in
Indiana's Economy

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Table of Contents

1

Minimum Wage Impacts on Employment: A Look at Indiana, Illinois, and Surrounding Midwestern States

Michael F. Thompson examines the effects that increasing the minimum wage has on employment.

7

Shifting Gears: Recent Changes in Indiana's Economy

Timothy F. Slaper and Alex Willey Cohen discuss the restructuring Hoosier manufacturing industry, from automobiles to advanced manufacturing.

From the Editor

As this issue goes to press, we face a series of shocks to the financial markets (Fannie, Freddie, Lehman Bros, AIG). We anticipate much will be written in the coming months about the financial markets, particularly in the next issue, which will reveal the forecasts for the coming year. But for now, let's focus on what our contributing authors reveal about jobs, wages, and industrial productivity. First up, economic analyst Michael Thompson weighs in on the recurrent question of whether setting higher minimums has an adverse effect on job growth. His analysis hones in on Indiana and the Midwest, with significant insights on border counties, as well. Economist Timothy Slaper shifts gears to a broader view with his trend analysis on the Indiana economy since the 2001 recession, revealing much about the effect of the life sciences efforts of the state on changing patterns of our top performing industries. As always, enjoy the fruits of our authors' labors and don't hesitate to weigh in with your comments by e-mailing ibrc@iupui.edu.

—COR

Minimum Wage Impacts on Employment

A Look at Indiana, Illinois, and Surrounding Midwestern States

Michael F. Thompson: Economic Research Analyst, Indiana Business Research Center, Kelley School of Business, Indiana University

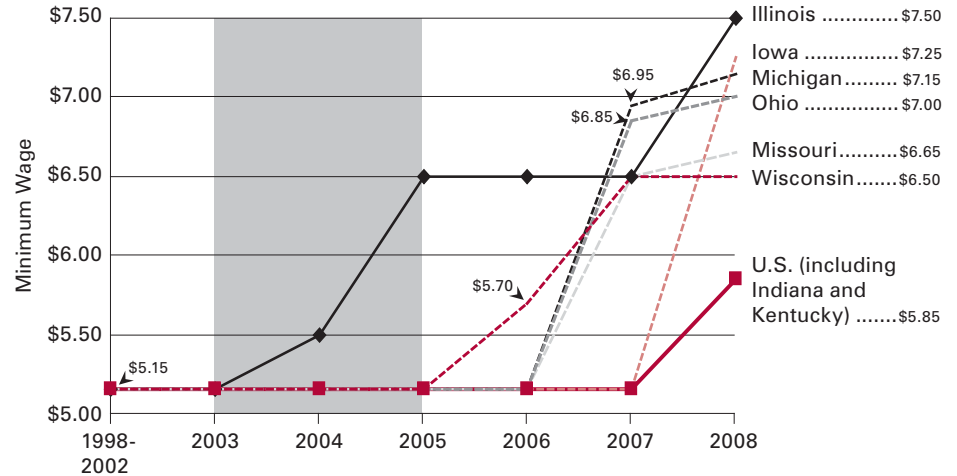
While minimum wage increases are a broadly popular method of reducing income inequality, they are controversial since many business owners and economists argue they reduce employment. This debate has resurfaced now that Indiana recently increased its minimum wage for the second time in twelve months, following a period of almost ten years when it remained constant at \$5.15 per hour.

This article summarizes the role of federal and state governments in setting the minimum wage and the mixed opinions concerning the outcome of such laws. To inform the debate on whether increasing minimum wages has an adverse impact on job growth, this study will compare Illinois—the only Midwestern state to raise its minimum wage in both 2004 and 2005—to Indiana and other neighboring states. Interestingly, not only did Illinois experience higher employment growth between 2002 and 2005 but minimum wage increases did not have a significant impact on employment growth in the region controlling for state GDP and population growth. Changing gears, this study then focuses on whether any negative effects of Illinois' higher minimum wages were found in vulnerable counties along the Indiana-Illinois border where minimum wages differed by \$1.35 in 2005. Particular focus will be given to the impact on employment in the low-wage "accommodation and food service" industry.

Federal vs. State Minimum Wage Legislation

Most workers are covered by the Federal Fair Labor Standards Act (FLSA) and are paid at least the

FIGURE 1: Effective Minimum Wages for Most Employers in Midwestern States, 1998 to 2008*



*January 1 each year

Source: Tax Policy Center (www.taxpolicycenter.org)

federal minimum wage, which was first enacted in 1938 to maintain the "minimum standard of living necessary for health, efficiency, and general wellbeing of workers."¹ Current FLSA legislation ensures that workers receive at least \$6.55 per hour (up from \$5.85 effective July 24, 2008) and the minimum wage will increase again to \$7.25 on July 24, 2009.² State law is allowed to supersede the federal law only in states that have set higher minimum wages. Currently most states have minimum wages above the federal mark—with a high of \$8.07 in the state of Washington.³ This growing trend of states setting their own minimum wage laws is largely in response to the nearly ten-year gap between the last two federal minimum wage increases in September 1997 and July 2007—the longest gap in the history of the FLSA.⁴

Figure 1 shows that, while no Midwestern states had set higher minimum wages than the federal level of \$5.15 between 1997 and

2003, almost all states in the region had done so by 2007. Indiana's state minimum wage is officially set to be equal to the federal rate. Notable among Midwestern states is Illinois, whose \$0.35 increase in 2004 and further \$1 increase in 2005 represent the only minimum wage increases in the region during the highlighted 2003–2005 time period, except for Wisconsin which raised its minimum wage by \$0.55 halfway through 2005.

Popular Opinion vs. Minimum Wage Economics

Even though a \$2 per hour increase in the minimum wage would only affect the wages of approximately 7 percent of the national population, pollsters generally find support for minimum wage increases to be around 70 percent.⁵ In one of the most detailed examinations of minimum wage legislation, Jerod Waltman reveals that this high level of support is not limited to people earning less than \$20,000 annually, since three-fifths of people earning over \$75,000 annually also support such increases.

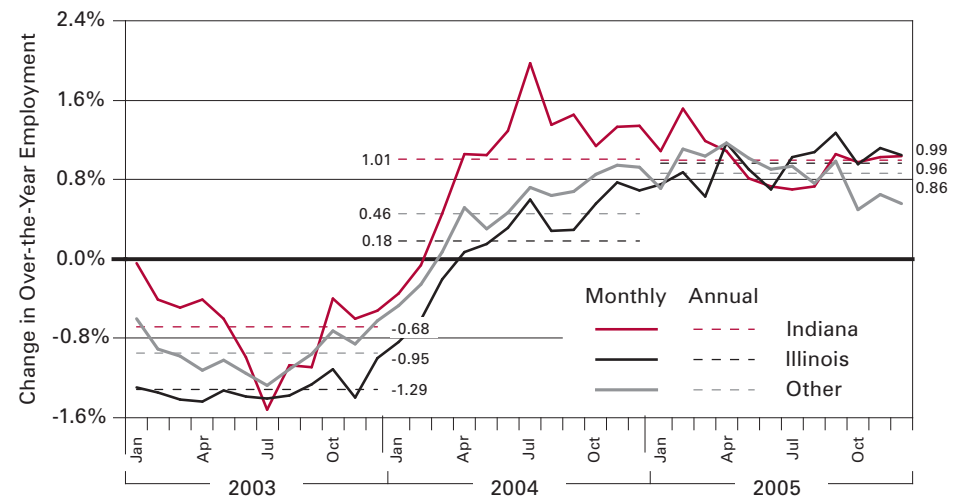
He also finds broad support among both registered Democrats and Republicans, as well as across all racial groups. The typical minimum wage earner is hardly a middle-class teenager earning pocket-change—almost half of this population is above the age of 25, 41 percent work full-time and 87 percent are white.⁶ Many Americans sympathize with minimum wage earners since they have earned low wages at some point in their lives, and over 17 percent of Americans without a college degree have at least one family member who earns the minimum wage.⁷

Despite this popularity, influential policy makers and economists have mixed opinions regarding whether increasing the minimum wage would help or hurt low-income workers. Jarod Bernstein, Elizabeth McNichol, and Karen Lyons argue that a stagnant minimum wage is partly to blame for rising income inequality across the United States. They explain that while high income earners saw their incomes rebound quickly after the economic recession of 2001, minimum wage workers saw the value of their income decline in real value (after adjusting for inflation) to a purchasing power 28 percent lower in 2005 than it was in the late 1970s.⁸ However, Craig Garthwaite and colleagues at the Employment Policies Institute counter that increasing the minimum wage would likely lead to higher levels of unemployment as businesses find they are unable to employ as many workers.⁹

Minimum Wage Increases vs. Job Growth at the State Level

The fact that Illinois represents the primary Midwestern state to increase its minimum wages between 2003 and 2005 provides a good test case to understand the effect increasing the minimum wage has on employment growth. Major Illinois newspapers summarized the concerns of several critics of Illinois' decision to raise

■ **FIGURE 2: Monthly and Annual Percent Change in Private Employment, 2003 to 2005**



Note: Other Midwestern states include Iowa, Kentucky, Michigan, Missouri, Ohio, and Wisconsin.
Source: IBRC, using data from the Bureau of Labor Statistics, Quarterly Census of Employment and Wages

its minimum wage, especially when it was poised to make a full dollar increase in 2005. Critics included the Illinois state director of the National Federation of Independent Business who believed that small business owners would have little choice other than “laying off people, cutting back hours or cutting benefits.”¹⁰ However, the Illinois governor later countered that his state actually led the nation in job growth for two months during 2005 and has pushed for his state to continue adjusting the minimum wage to reflect changing costs of goods and services.¹¹

Data from the U.S. Bureau of Labor Statistics (BLS) are used here to evaluate whether or not Illinois' minimum wage may have affected its employment growth compared to Indiana and surrounding Midwestern states.¹² **Figure 2** shows the employment growth for private employers in all industries over the previous year for each month and the annual average for 2003 through 2005.

Overall, we see substantial job losses among private employers in all Midwestern states in 2003. During this period, no state had a higher minimum wage than \$5.15 (the default U.S. rate) and the region—

like much of the nation—was still recovering from the 2001 recession. This decline was particularly acute in Illinois whose 2003 employment figures were 1.3 percent lower than the previous year; only Michigan had worse employment decline (-1.8 percent).

Despite its \$0.35 increase in minimum wages, Illinois joined virtually all other Midwestern states by achieving marginal employment growth in 2004. Although its job growth of only 0.2 percent could hardly have erased the damaging job losses of the prior year, its increase in minimum wage did not prevent it from rebounding employment figures. Of course, other states without minimum wage increases seemed to have improved even better, including Indiana with a 1 percent increase and notably Iowa whose 1.5 percent growth was even better than the U.S. figure of 1.3 percent.

However, Illinois achieved the region's second biggest improvement in job growth in 2005 when it increased its minimum wage by a full dollar to \$6.50 per hour. Illinois' job growth of 0.96 percent closed the gap with its Midwestern neighbors and was substantially better than the other two comparably large

Midwestern states: Ohio had only 0.21 percent employment growth and Michigan still had a small decline of -0.02 percent.

Reconsidering Minimum Wage Effects on Job Growth

These patterns in job growth between 2003 and 2005 indicate that Illinois' increasing minimum wage rates did not reduce overall employment growth for private employers and preliminary statistical analyses confirm this lack of an impact as we see in **Table 1**. These analyses use U.S. Bureau of Labor Statistics (BLS) and U.S. Bureau of Economic Analysis (BEA) data from eight Midwestern states to analyze what may account for the one-year employment change for each of thirty-six months from January 2003 to December 2005.

First, column 1 of the table shows that minimum wage increases on their own do not have a significant impact on employment growth when we simply control for the time periods of this study. This is in marked contrast to the traditional model (column 2) where, as expected, we see strong positive impacts of state GDP growth and population growth.¹³

Even in the full model (column 3) we see that minimum wages still have no significant impact—positive or negative—on employment growth, once we control for traditional factors.¹⁴ Comparatively, the model estimates a 0.8 percent increase in employment for every 1 percent increase in population and a 0.2 percent increase in employment estimated for each 1 percent increase in state GDP. The time periods had substantially greater positive impacts reflecting the gradually improving U.S. economy. Employment growth between 2003 and 2004 was 1.3 percent better than growth during the base year (2002–2003) and the employment growth between 2004

TABLE 1: Impact of Select Variables on Employment Growth for Midwestern States, January 2003 to December 2005

Model:	1	2	3	4
	Minimum Wage Only	Population and State GDP Growth	Complete Model	Fixed-Effects
Minimum Wage Increase ^a (\$)	-0.329 (0.93)		0.428 (1.49)	-0.139 (0.25)
Population Growth ^a (%)		0.947** (3.93)	0.841** (3.85)	0.876 (1.46)
Real GDP Growth ^a (%)		0.212** (10.45)	0.196** (8.68)	0.129+ (2.22)
Previous Year's Real GDP (Billions)		-0.002** (5.03)	-0.003** (6.08)	0.024 (0.80)
Annual Period Compared to 2002–2003				
Period 2003–2004	1.507** (12.57)	1.259** (11.85)	1.263** (11.71)	1.228** (6.05)
Period 2004–2005	1.983** (10.27)	2.076** (15.37)	2.002** (17.60)	1.768** (6.89)
Constant	-0.817** (4.12)	-1.233** (5.79)	-1.038** (6.25)	-6.770 (1.02)
Observations	288	288	288	288
R-squared	0.596	0.835	0.840	0.818
BIC ^c	-243.874	-491.079	-494.316	

Note: N = 288 (8 groups of 36 months each). The coefficients are estimated via Ordinary Least Squares (OLS) regression with cluster-corrected robust t statistics in parentheses. Additionally, Model 4 uses Fixed-Effects estimation. Symbols following coefficients denote significance levels: + = 10%; * = 5%; ** = 1%. Midwestern states refer to Illinois, Indiana, Iowa, Kentucky, Michigan, Missouri, Ohio, and Wisconsin.

(a) Measures for "growth" and "increase" reflect change between current month and same month in the previous year. Real State GDP figures use chained 2000 dollars.

Source: IBRC, using data from the Bureau of Labor Statistics and the Bureau of Economic Analysis

and 2005 was 2 percent better than during the base year.

Keeping in mind that every state may have unique internal factors at play, column 4 represents an exploratory fixed-effects model to account for unobserved heterogeneity within each individual state.¹⁵ In this model, only the time periods are highly significant and real GDP growth is only marginally significant—indicating that the impacts observed in the full model are not primarily due to peculiarities within these Midwestern states over this time period.

The question of why increases in the minimum wage do not significantly reduce employment is beyond the scope of this article but several possible answers deserve future study. One idea is that perhaps more low-wage employees are able to enter and stay within the labor market with the promise of earning better income. Early evidence of this may be seen in Washington State where employment growth has been high and even low-wage employers in small towns seem to have found manageable ways to offset extra labor

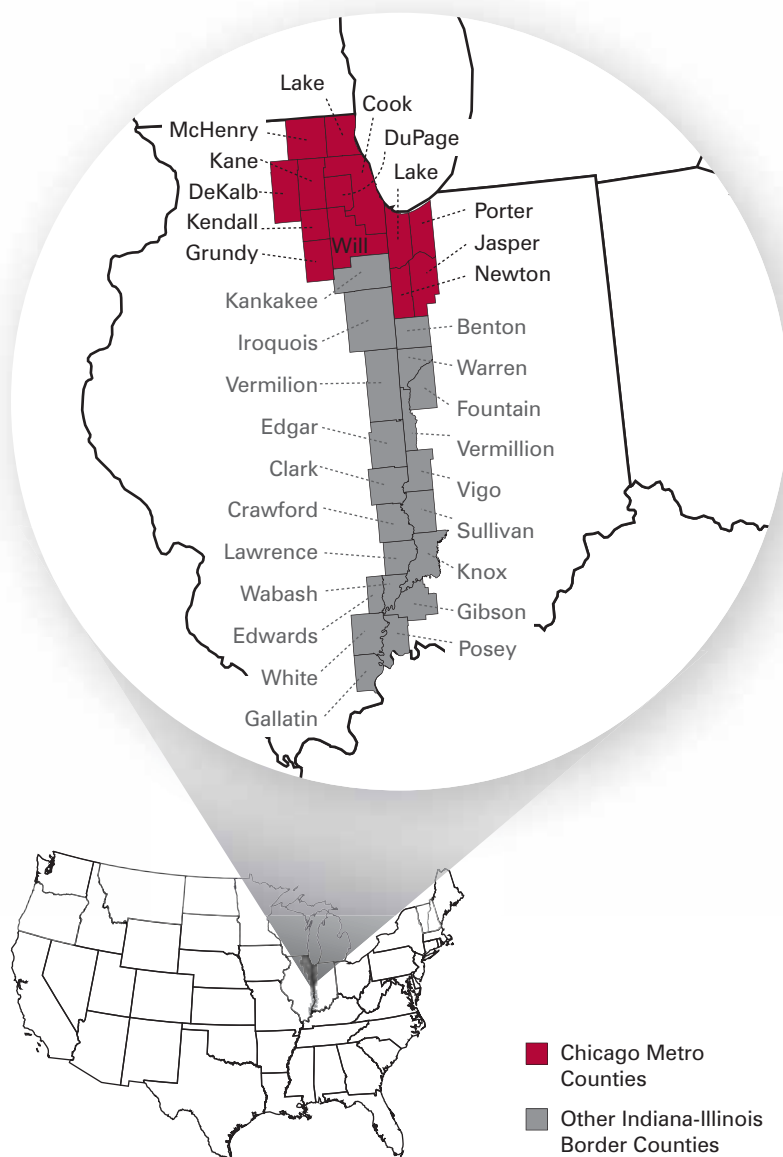
costs due to the highest minimum wage rates in the country.¹⁶

Employment Vulnerability

While the evidence presented so far strongly questions conventional wisdom that increasing the minimum wage reduces total employment at the state level, the relationship between minimum wages and employment may be far more complex in particular industries or in sub-state regions. To consider this potentially complex impact, we turn our attention to the accommodation and food service industry along the Indiana–Illinois border. Analysis will also focus on the counties within the Chicago Metropolitan Statistical Area (MSA) and other border counties to the south (see **Figure 3**).¹⁷ The Chicago area is highly integrated economically and socially across the border as evidenced by commuting patterns and employee tax records. Even though the border counties below the Chicago area are not as well integrated, we can still expect moderate cross-border activity due to the position of three interstate highways and moderately-sized cities near the border, like Danville in Illinois and Indiana cities Terre Haute and Vincennes.

Proving the importance of comparing employment between border regions with different minimum wages is the influential work of economists David Card and Alan B. Krueger who surveyed fast food restaurants through two studies (1994, 2000). They found that raising the state minimum wage actually increases employment relative to neighboring states that do not raise minimum wages, even considering the effects of economic recession and opposition by business leaders. This happened in New Jersey relative to Pennsylvania (eastern region) during the period 1990–1991 when New Jersey raised their minimum wage to \$5.05 above the federal rate of

FIGURE 3: Border Counties between Indiana and Illinois In and Below the Chicago Metro



Source: Indiana Business Research Center

\$4.25 at that time. Also proving their point was that the opposite happened in 1996 in Pennsylvania in relation to New Jersey when the federal minimum wage increase had a greater impact on employment growth in Pennsylvania (it was not initially binding in New Jersey).¹⁸

The accommodation and food service (A&FS) industry is key to understanding the impact of

minimum wage changes because it employs a high number of low-wage workers. Over three-quarters of jobs in this industry are in the lowest-paid food preparation and serving related occupational group, which includes fast food workers, short order cooks and counter attendants.¹⁹ Most notably, 25,602 (or 10 percent) of Indiana's food preparation and service workers received less than

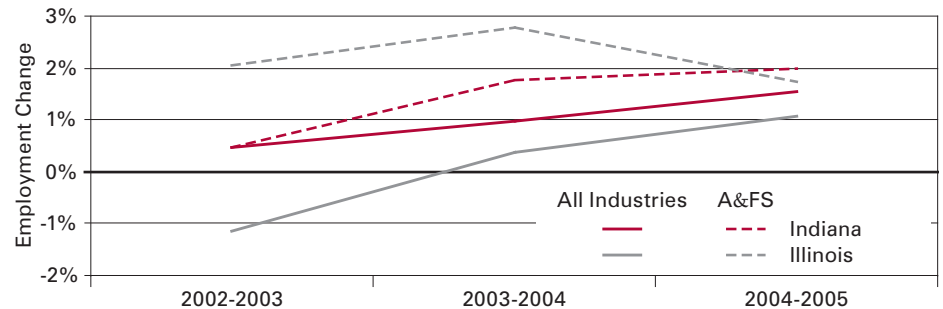
\$11,750 in total wages in 2005,²⁰ corresponding to less than \$5.64 per hour or \$0.86 under Illinois' minimum wage of \$6.50 that year. The fact that Illinois' employment growth in the A&FS sector slowed from 2 percent between 2003–2004 to 1.7 percent between 2004–2005 suggests measurable impacts of minimum wage increases.

Employment Change in the Chicago Metro in Indiana–Illinois Border Counties

Comparing overall employment growth within the Chicago MSA, **Figure 4** illustrates that Indiana's counties had higher annual growth during all three time periods but Illinois counties closed the gap considerably during the years it raised its minimum wages. The Indiana side of the border gained 0.5 percent in employment between 2002 and 2003, compared to the high job loss of 1.2 percent on the Illinois side—a difference of 1.6 percentage points (without rounding error). However, Illinois' counties rebounded to a 0.4 percent employment gain between 2003 and 2004 at the same time the state raised its minimum wages by \$0.35 and made an even bigger 1.1 percent gain when it raised its minimum wage a full dollar from \$5.50 to \$6.50. While Indiana's counties still had higher job growth of 1.5 percent, the gap between the two states' counties had narrowed to 0.5 percentage points (without rounding error).

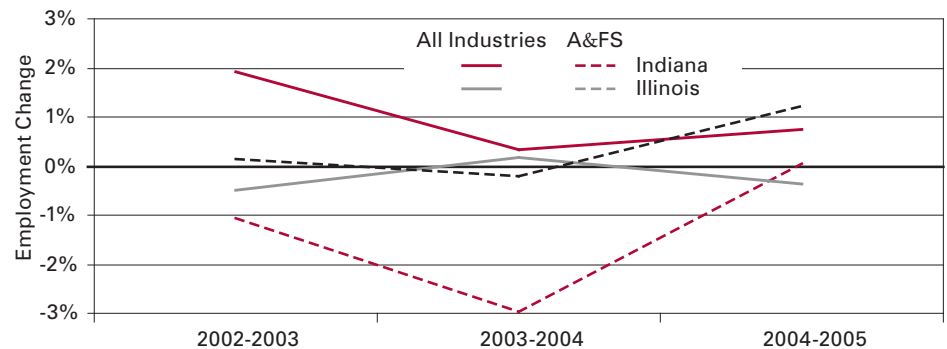
Employment among A&FS employers in the Chicago MSA, however, may have been adversely affected by Illinois' increasing minimum wage. **Figure 4** shows that while Illinois' counties had substantially better job growth (over a full percentage higher) in the 2002–2003 and 2003–2004 time periods, Indiana's counties closed the gap and had better job growth during 2004–2005. In this latter time period, these largely low-wage employers

FIGURE 4: Annual Employment Change in All Industries and Accommodation and Food Services for Private Employers in Indiana and Illinois Border Counties within the Chicago Metro, 2003 to 2005



Note: A&FS industry employment data for Indiana's Newton County were suppressed by BLS so are not included in Indiana's A&FS trend line.
Source: IBRC, using data from the Bureau of Labor Statistics, Quarterly Census of Employment and Wages

FIGURE 5: Annual Employment Growth in All Industries and Accommodation and Food Services for Private Employers in Indiana and Illinois Border Counties South of the Chicago Metro, 2003 to 2005



Note: A&FS industry employment data for Indiana's Sullivan and Vermillion counties, as well as Illinois' Edwards and Gallatin counties, were suppressed by BLS so are not included in the A&FS trend lines.
Source: IBRC, using data from the Bureau of Labor Statistics, Quarterly Census of Employment and Wages

in the Indiana border counties achieved almost 2 percent job growth while their Illinois counterparts saw their job growth rate shrink a full percentage point to 1.7 percent. It is also worth mentioning that statewide A&FS employment trends were also similar in this regard.²¹

Employment Change Outside the Chicago Metro in Indiana–Illinois Border Counties

Looking at counties along the border below the Chicago MSA, **Figure 5** shows moderate job growth in the Indiana counties and more losses than gains in employment for those in Illinois. However, it is worth noting that, while the large gap between

these two groups of counties' employment growth in the 2002–2003 period narrowed almost entirely in 2003–2004, the gap reopened considerably during the 2004–2005 time period when Indiana's counties experienced 0.7 percent job growth while their Illinois counterparts had job losses of 0.4 percent.

However, the overall job losses for Illinois border counties between 2004–2005 cannot be directly attributed to the increasing minimum wage, since employment in the low-wage A&FS sector actually grew remarkably for Illinois counties over this period. In marked contrast to the tremendous job losses between 2002–2003 and 2003–2004 among A&FS

employers along the Indiana border, those in Illinois generally maintained their job levels, as we see in **Figure 5**.²² However, coinciding with their state's one dollar hike in minimum wages, A&FS employment within Illinois' border counties increased 1.2 percent while similar sector employment in Indiana held steady between 2004 and 2005.

Decoupling the Minimum Wage-Employment Link

Empirical analysis strongly challenges the conventional wisdom that increasing the minimum wage hampers employment. Although these statistical results focus on states in just one U.S. region over a fairly narrow time period, they strongly suggest that we cannot assume that minimum wage increases will have a negative impact on employment change.

Even employment in the vulnerable border region between Indiana and Illinois and within the low-wage A&FS industry is not decidedly affected by minimum wage increases. Within the urban Chicago region, overall employment growth in Illinois' border counties improved substantially despite the state's increase in minimum wages although the growth rate among these counties' A&FS sector employers was slower relative to those within Indiana in the year of Illinois' biggest minimum wage increase (2004–2005). While employment growth was better among Indiana's border counties south of Chicago, A&FS employment among their Illinois' counterparts performed far better during the 2004–2005 period.

As minimum wages continue to increase both at the state and federal levels across the United States, there is a tremendous need for the debate to move beyond the simple assumption that they will reduce employment. Future empirical studies and political debates need to weigh the potential positive impact

that increasing the minimum wage could have on employment and carefully examine the regions and industries that may be negatively affected. If the overall impact is positive, perhaps special grants and tax transfers could be created to assist targeted employers and workers in vulnerable regions and industries. Proposals to increase the minimum wage continue to be highly popular among Americans concerned about rising economic inequality and deserve to be examined more seriously. ■

Notes

1. The full text of the U.S. Fair Labor Standards Act of 1938 is available at www.osha.gov/pls/epub/wageindex.download?p_file=F15794/FairLaborStandAct.pdf.
2. Official minimum wage information is available at www.dol.gov/compliance/laws/comp-flsa.htm.
3. In the few states that do not set minimum wages or have lower state minimum wages than the federal level, the vast majority of their employees receive the federal minimum wage that covers most types of employment. Minimum wage rates across the 50 states are available on the U.S. Department of Labor website at www.dol.gov/esa/minwage/america.htm.
4. An official timeline of federal minimum wage rates is available at www.dol.gov/esa/minwage/chart.htm.
5. Jon Gertner, "What Is a Living Wage?" *The New York Times*, January 15, 2006. Online at www.nytimes.com/2006/01/15/magazine/15wage.html.
6. Jerod Waltman, "The Politics of the Minimum Wage," Urbana: University of Illinois Press, 2000.
7. *Ibid.*
8. Jarod Bernstein, Elizabeth McNichol, and Karen Lyons, "Pulling Apart: A State-by-State Analysis of Income Trends," Center on Budget and Policy Priorities / Economic Policy Institute, 2006.
9. Craig Garthwaite, "Minimum Wage Hurts Oregon's Vulnerable Workers," vol. 2006, 2003. The Employment Policies Institute is available online at www.epionline.org.
10. Barbara Rose and John Chase, "Illinois Minimum Wage Rises; Debate Continues," *Chicago Tribune*, January 4, 2005.
11. State of Illinois, Office of the Governor. "Blagojevich Proposes Raise in Minimum Wage for Veto Session," October 28, 2006. Online at www.il.gov/PressReleases/ShowPressRelease.cfm?SubjectID=1&RecNum=5466.
12. For the purposes of this article, Midwestern states include Illinois, Indiana, Iowa, Kentucky, Michigan, Missouri, Ohio, and Wisconsin.
13. The small negative coefficient for previous year's real state GDP simply indicates that employment growth is slightly less for states which already had large economies in the prior year, all other conditions equal.
14. The full model has the highest R-squared value and most negative BIC' value indicating that it explains the most variation in employment growth and has the best statistical fit.
15. Tests proved that there was serial correlation within the panel data. Since a Hausman test was inconclusive as to whether a fixed-effects or random effects model was preferable, a fixed-effect model was selected due to the larger number of monthly observations (N = 36) relative to time periods (t = 3) for the eight states.
16. Timothy Egan, "For \$7.93 an Hour, It's Worth a Trip Across a State Line," *The New York Times*, January 11, 2007.
17. Here, the Chicago MSA counties comprise those of the Chicago-Naperville-Joliet MSA defined by the U.S. Office of Management and Budget (OMB) but exclude Kenosha County in Wisconsin. Fountain County, Ind. is included among counties along the border south of the Chicago MSA due to its close proximity and worker commuting patterns across the border.
18. These two studies by David Card and Alan B. Krueger are: a) "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania," *American Economic Review*, 84 (4): 772–93, 1994, and b) "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania: Reply," *American Economic Review*, 90 (5): 1,397–420, 2000.
19. Complete data on occupations in the accommodation and fast food industry is available from the U.S. Bureau of Labor Statistics (BLS) Occupational Employment Survey available at www.bls.gov/oes/current/naics2_72.htm.
20. Allison Leeuw, "The Wage Pyramid: Wage Variance in Indiana," *InContext*, July 2007. Online at www.incontext.indiana.edu/2007/july/1.html.
21. Illinois' statewide employment growth in the A&FS sector slowed from 2 percent between 2003 and 2004 to 1.7 percent between 2004 and 2005 while Indiana A&FS employment growth remained relatively stable around 1.6 percent during these periods.
22. This analysis does not include A&FS employment for four border counties (two each from Indiana and Illinois) whose data were suppressed by the U.S. Bureau of Labor Statistics due to confidentiality restrictions. However, employment in this sector is small within these counties (roughly 8.8 percent within Indiana and 1.8 percent in Illinois) so their omission should not substantially affect the overall trends.

Shifting Gears: Recent Changes in Indiana's Economy

Timothy F. Slaper: Director of Economic Analysis, Indiana Business Research Center, Kelley School of Business, Indiana University
Alex Willey Cohen: Research Assistant, Indiana Business Research Center, Kelley School of Business, Indiana University

In the days of yore, the story for the Indiana economy started—and ended—with automobile manufacturing. Not anymore.

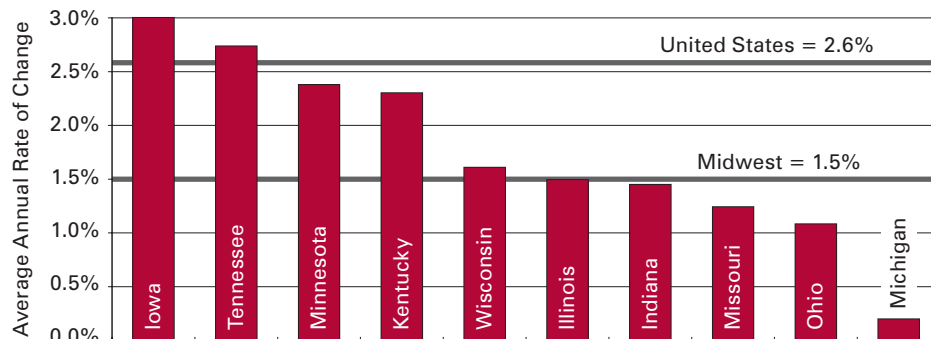
There have been tremendous structural changes in the global, U.S., and Indiana economies in the last decade. The economic pressures resulting from the 2001 recession accelerated many of those structural changes. To paraphrase the old car advertisement, this isn't your father's Hoosier economy.

Recently released data show that the Indiana economy has been in transition. Some industries have been growing quickly, while others have been shrinking. Output of the automobile industry—motor vehicles and parts—has grown at a rate below the rate of inflation and primary metal manufacturing has been in a slow retreat. Other industries, such as chemicals and miscellaneous manufactured products, have done fairly well. This article examines Indiana's growth patterns over the last decade and, particularly, since the end of the last recession in 2001. There is at least one clear revelation: Indiana's largest manufacturing industry isn't automobiles anymore.

Starting with the big picture from 2001 to 2007, Indiana's real gross domestic product (GDP) rose at an average annual rate of nearly 1.5 percent, barely shy of the Midwest average and more than 1 percentage point below the U.S. growth rate, as **Figure 1** shows.

As **Figure 2** and **Figure 3** show, Indiana has a particularly high percentage of its GDP and employment associated with manufacturing. As a result, as the national economy has transitioned from manufacturing to higher value-added industries, Indiana was particularly vulnerable to job loss. The size of the health care

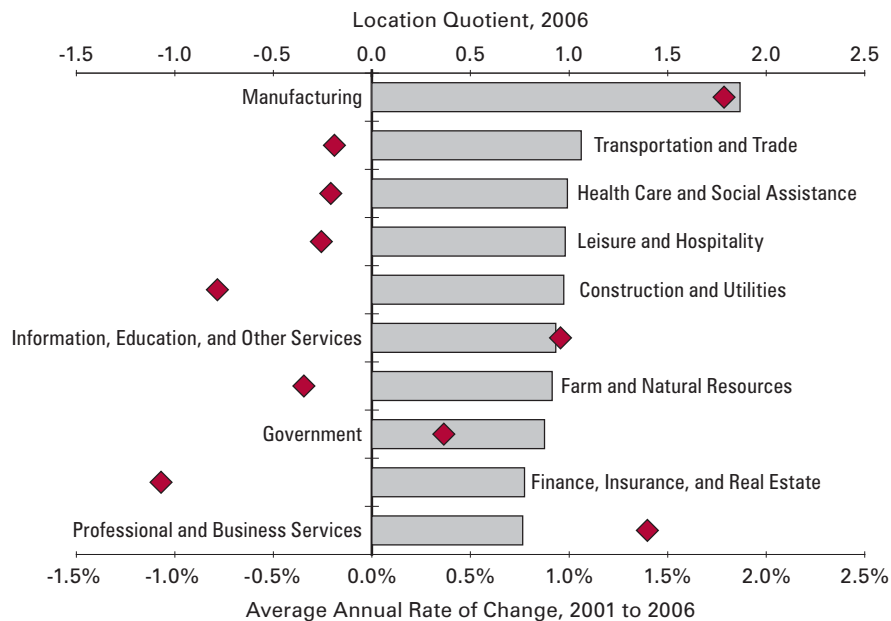
FIGURE 1: Economic Growth in the Midwest—Percent Change in Real GDP by State, 2001 to 2007



Source: Bureau of Economic Analysis

“Indiana's largest manufacturing industry isn't automobiles anymore.”

FIGURE 2: Employment Concentration by Sector—Comparing Indiana to the United States



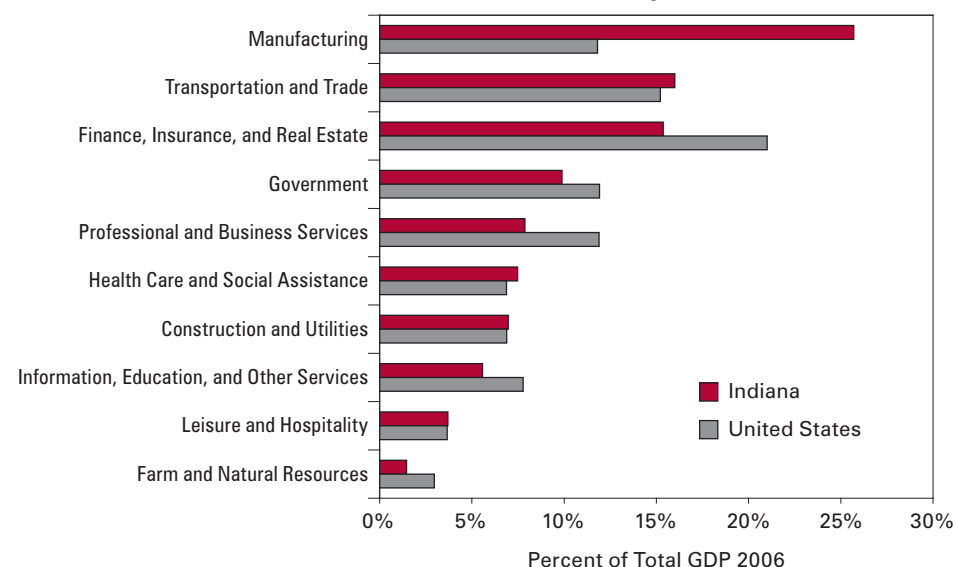
■ Location Quotient (top axis) ◆ Change in Employment Concentration (bottom axis)

Note: The United States has an LQ of 1 for all sectors. LQ measures the level of employment concentration relative to the nation.

Source: Bureau of Economic Analysis

“ Manufacturing comprises 12 percent of U.S. output; in Indiana, manufacturing’s contribution is more than twice that. On the other hand, Indiana’s professional and business service sector is less than half that of the nation. ”

■ FIGURE 3: Percent Contribution to Current-Dollar GDP by Sector, 2006



Source: Bureau of Economic Analysis

sector, the construction and utilities sector, and the transportation and trade sector are about the same for Indiana and the nation. In other sectors, the differences are more dramatic. Manufacturing, for example, comprises 12 percent of U.S. output; in Indiana, manufacturing’s contribution is more than twice

that. On the other hand, Indiana’s professional and business service sector, one of the faster growing sectors in the U.S. economy, is less than half that of Illinois and the nation.

The state’s industrial composition favors durable goods manufacturing. While the state’s proportion of

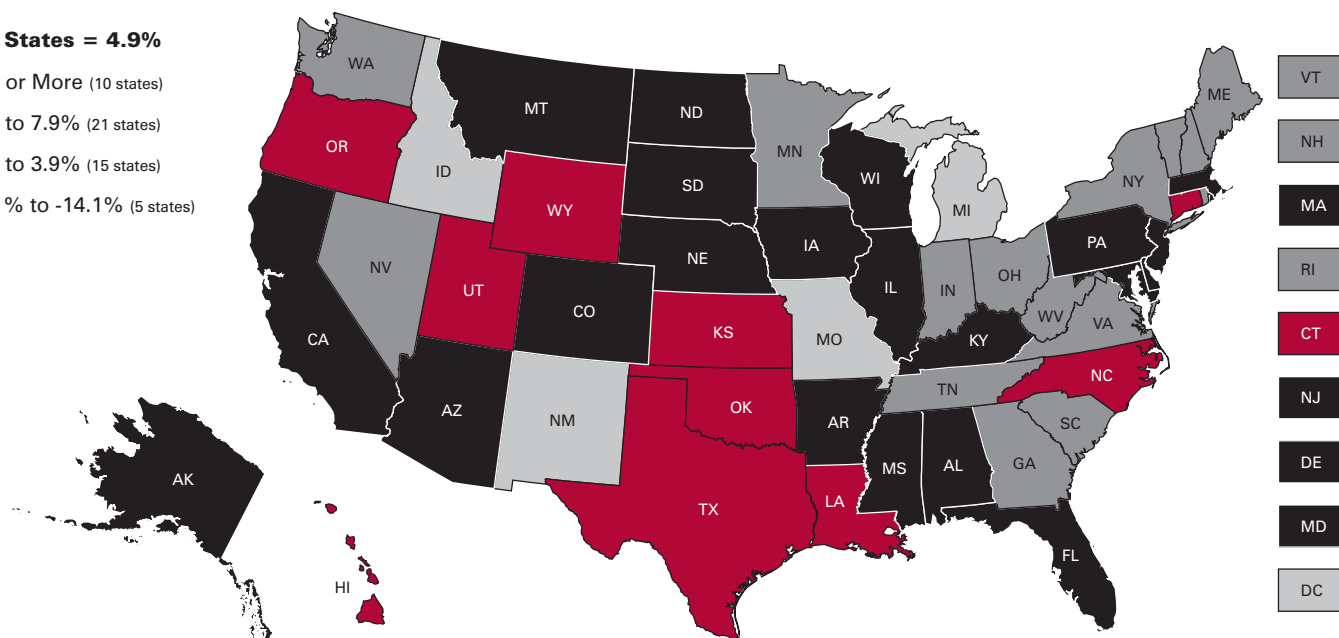
output devoted to durable goods manufacturing is the highest in the nation, Indiana’s growth in durable goods manufacturing was 4.4 percentage points below the U.S. average from 2005–2007, as shown in Figure 4.

There are two notable bright spots within durable goods manufacturing

■ FIGURE 4: Average Annual Rate of Change in Current-Dollar Output for Durable Goods Manufacturing, 2005 to 2007

United States = 4.9%

- 8% or More (10 states)
- 4% to 7.9% (21 states)
- 0% to 3.9% (15 states)
- -0.1% to -14.1% (5 states)



Source: Bureau of Economic Analysis

and, to some degree, this may take the sting out of the decline in automobiles. In Indiana, other transportation equipment—boats, aerospace, and railroad equipment—current-dollar output grew by more than 10 percent at an average annual rate from 2001 to 2006.¹ The life sciences also have something to boast about. Miscellaneous manufacturing—which includes the manufacture of medical devices—current-dollar output increased nearly 5 percent at an average annual rate from 2001 to 2006, although overall output growth in 2006 slowed from 2005.

Nondurable goods manufacturing is about half the size of durable goods manufacturing in Indiana. As was the case for durable goods manufacturing, from 2005 to 2007, Indiana inhabited the bottom quintile of states in the growth of the nondurable sector, as shown in **Figure 5**.

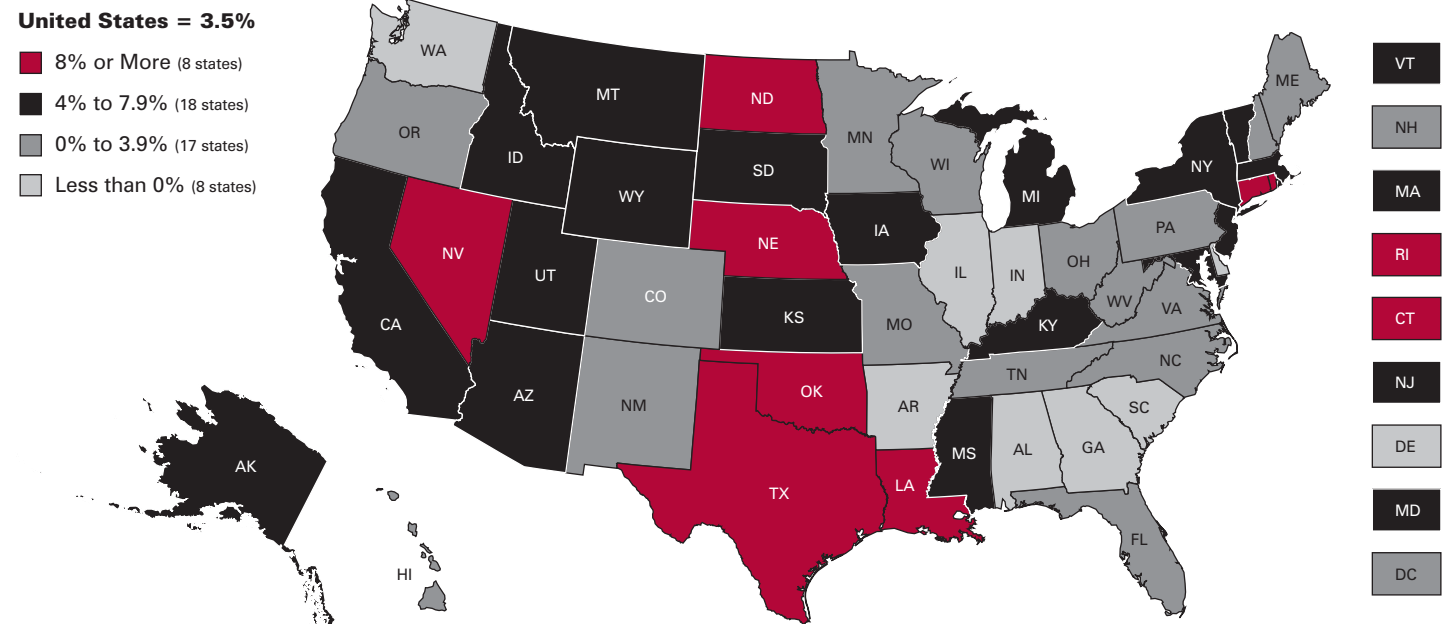
Table 1 presents the transformation of Indiana manufacturing output in the last decade. While the automobile

■ **TABLE 1: Indiana's Manufacturing Sector Composition, 1997 and 2006**

Industry	Percent of Manufacturing GDP	
	1997	2006
Chemicals	15.8	19.7
Motor Vehicles and Parts	17.4	17.2
Fabricated Metals	9.1	9.3
Miscellaneous	5.1	8.2
Machinery	8.1	7.7
Primary Metals	11.7	7.1
Plastics and Rubber	5.6	5.6
Food Products	5.8	5.0
Other Transportation Equipment	1.7	3.0
Computers and Electronics	2.5	2.7
Furniture and Related Products	2.7	2.6
Nonmetallic Minerals	2.7	2.4
Printing	2.7	2.2
Petroleum and Coal Products Manufacturing	1.2	2.1
Wood Product Manufacturing	2.1	1.8
Electrical Equipment and Appliance Manufacturing	3.6	1.7
Paper Manufacturing	1.6	1.4
Textile and Textile Product Mills	0.3	0.2
Apparel Manufacturing	0.2	0.2

Source: Bureau of Economic Analysis

■ **FIGURE 5: Average Annual Rate of Change in Current-Dollar Output for Nondurable Goods Manufacturing, 2005 to 2007**

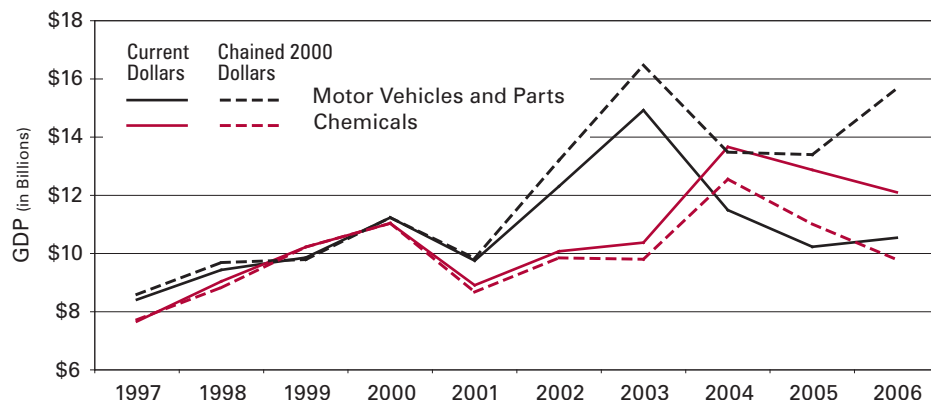


Source: Bureau of Economic Analysis

industry has remained constant as a percent of Indiana's manufacturing sector, it has been eclipsed by chemical manufacturing. That's right: in 2006, Indiana's production of chemical products—including pharmaceuticals—was greater than motor vehicles and parts.

This revelation may come as something of a surprise. The nature of the data used to track industry performance may explain why this fact may not be well known. **Figure 6** shows the output changes for the two industries over time. The solid lines plot current-dollar output, or economic output in the prices and quantities of the year. The dotted lines plot real or chained-dollar output. This measure is based in the year 2000 and reflects changes in prices so that increases in prices aren't confused for increases in economic production as one analyzes trends over time. Current-dollar output for a particular year is inflated or deflated using price indexes that are custom-made for each industry to derive real chained-dollar output. In other, less precise words, the real

FIGURE 6: Indiana Chemical and Motor Vehicle Manufacturing, Current- vs. Chained-Dollar GDP, 1997 to 2006



Source: Bureau of Economic Analysis

chained-dollar output (GDP) measure has been adjusted for inflation.

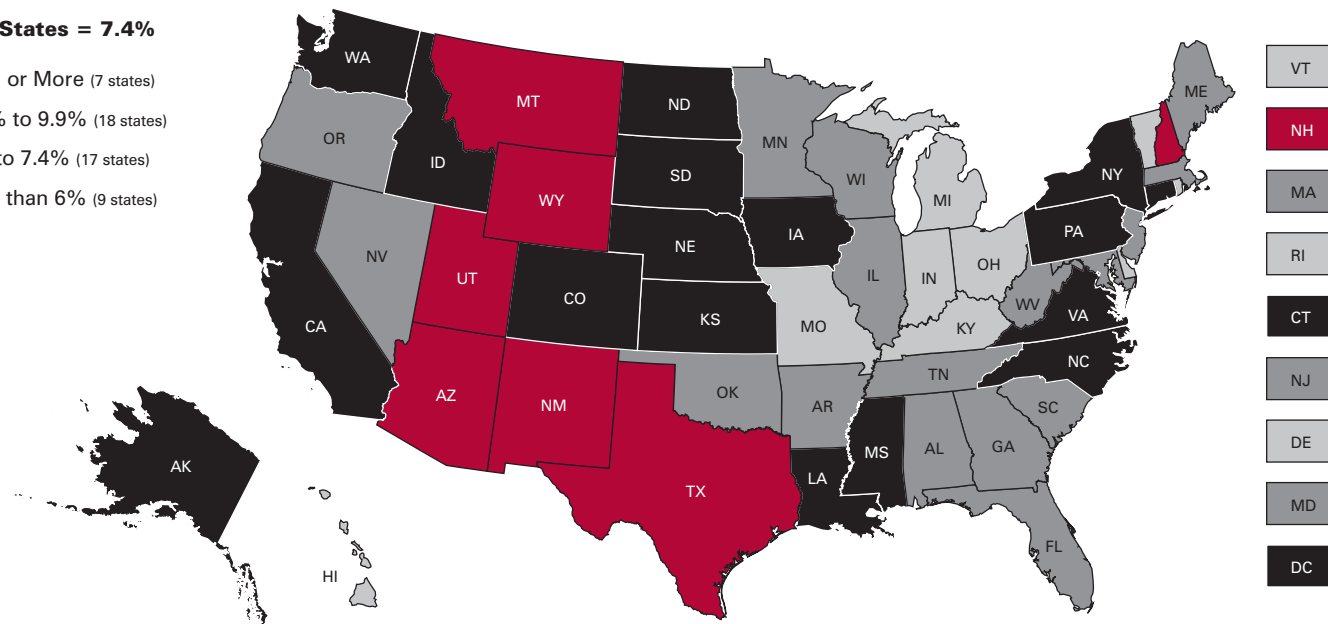
There is a potential problem, however, by over-reliance on the real chained-dollar measure. The chained index takes into account changes in prices, but it also accounts for changes in product quality and features. Computers are a classic example: prices have fallen while features and capabilities have expanded. As a result, computer output measured in current dollars

has increased at an average annual rate of 9.5 percent since 2001 in Indiana, but real chained-dollar output has increased at an average annual rate of 23.1 percent since 2001. The reason the real measure is over twice that of the current “dollars of the day” measure is that, even if output and prices stayed constant over the period, computers got better and that is reflected in the price index used to calculate the real chained-dollar measure.

FIGURE 7: Average Annual Rate of Change in Current-Dollar Output for Professional and Business Services, 2005 to 2007

United States = 7.4%

- 10% or More (7 states)
- 7.5% to 9.9% (18 states)
- 6% to 7.4% (17 states)
- Less than 6% (9 states)

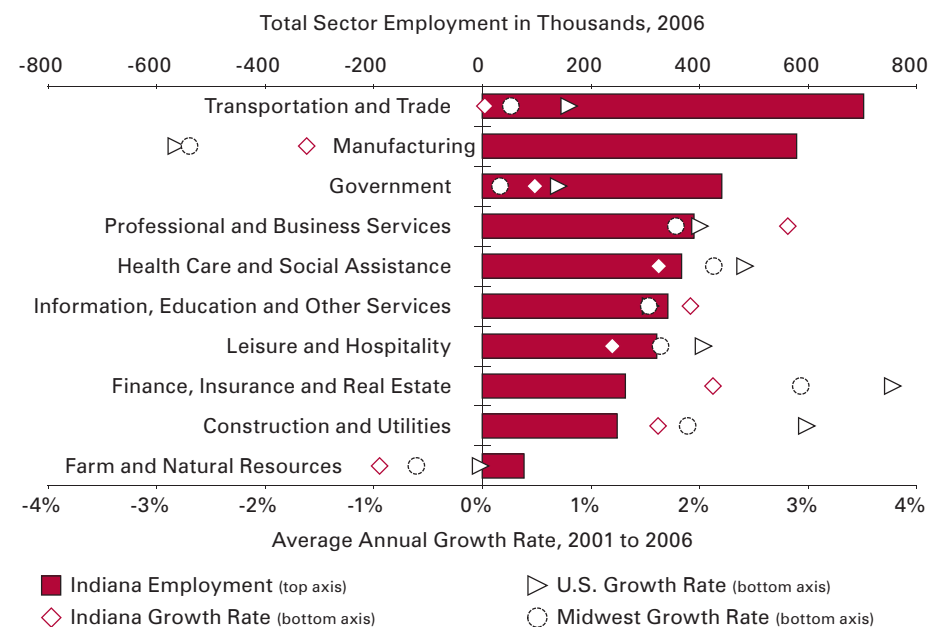


Source: Bureau of Economic Analysis

That 2006 chemical manufacturing output is greater than automotive output is evidence that Indiana's manufacturing is restructuring. The output of motor vehicles and parts, as a proportion of Indiana's GDP, fell from 5 percent to 4.4 percent from 2001 to 2006. Primary metal manufacturing output has been trending downward as well, falling to 1.8 percent in 2006 from 2.5 percent in 2001 and 3.4 percent in 1997. Meanwhile, chemical manufacturing, as a proportion of state GDP, has fluctuated over the last decade and stood at 5.1 percent of state output in 2006.

On the service sector front, Indiana has not kept pace with the nation or its Midwestern neighbors. For two of the fastest growing sectors—namely, professional and business services and information, education, and other services—Indiana's growth rate is below the national average, as **Figures 7 and 8** show. Indiana's professional and business service sector is relatively small and, if one may hazard a forecast, will likely

■ **FIGURE 9: Employment Growth by Sector, 2001 to 2006**



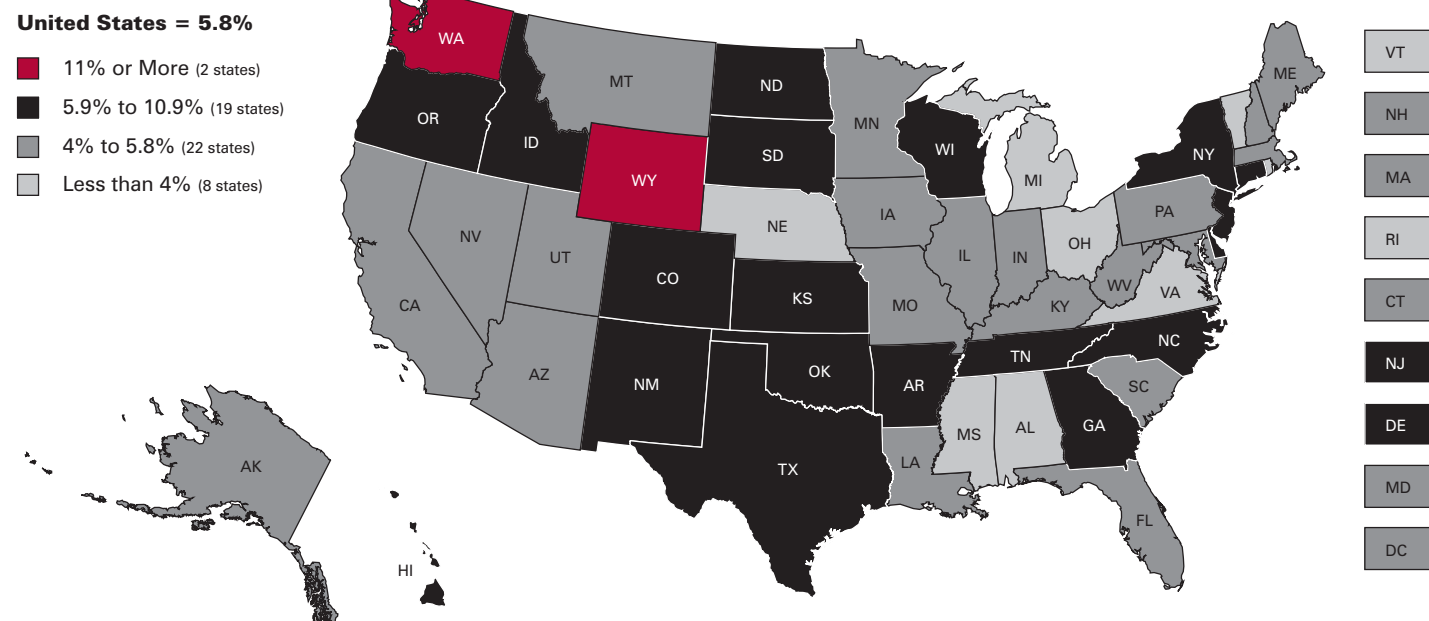
Source: Bureau of Economic Analysis

remain so given that its growth rate is below the national average.

While average output growth in professional and business services has been lackluster, the sector's employment gains were the best in the state. From 2001

to 2006, employment grew at an average annual rate of 2.8 percent. Employment gains in information, education, and other services were also above average, as **Figure 9** shows.

■ **FIGURE 8: Average Annual Rate of Change in Current-Dollar Output in Information, Education, and Other Services, 2005 to 2007**

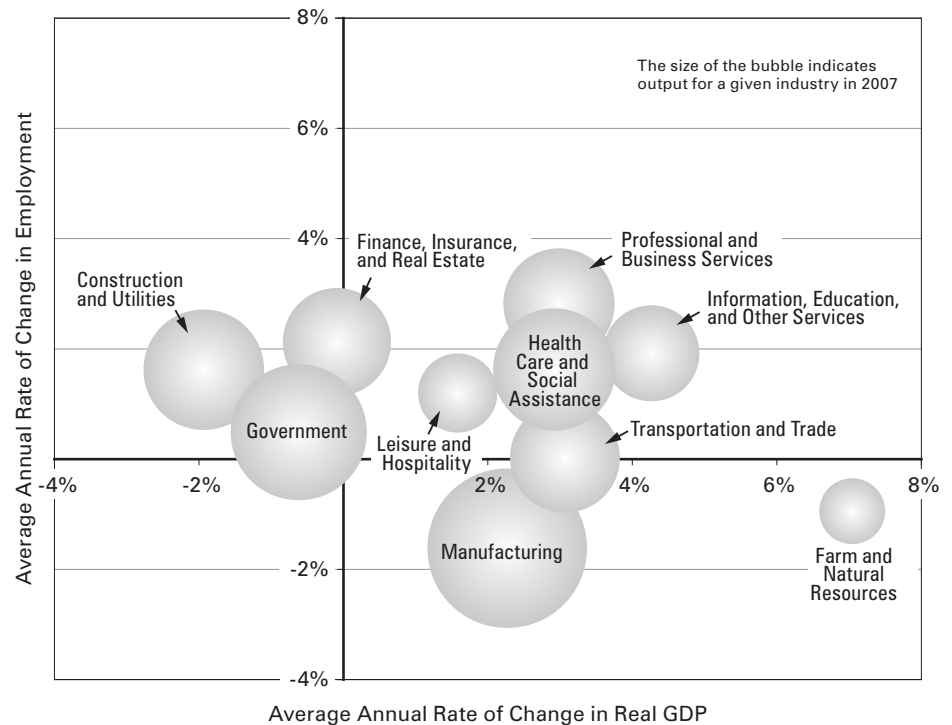


Source: Bureau of Economic Analysis

As **Figure 10** shows, the fortunes of change in output and employment do not always march in lockstep. The growth of Indiana's economic output—and the transition from one industry to another—has been inconsistent and the employment growth has likewise been rocky. **Figure 11** shows that Indiana's employment performance is at the lower end of the Midwest. Only Illinois and fellow motor vehicles and parts behemoths Ohio and Michigan fared worse. Given Indiana's dependence on manufacturing—and that sector's recent performance—the employment figures are not unexpected.

Indiana has a high location quotient in manufacturing and has increased its advantage since 2001 (refer again to **Figure 2**). It may be important to note that the state has not gained jobs but rather lost fewer jobs than the rest of nation. Indeed, Indiana's employment dynamics in the chemical and motor vehicles and parts industries have bucked the national trends, as **Figure 12** and **Figure 13** show. Indiana didn't hemorrhage jobs in motor vehicles and parts like the nation as a whole. Instead, employment stabilized after the recession. In chemical manufacturing, the employment trends for the United States and Indiana have also diverged.

■ **FIGURE 10: Real Output vs. Employment in Indiana, 2006**



Source: Bureau of Economic Analysis

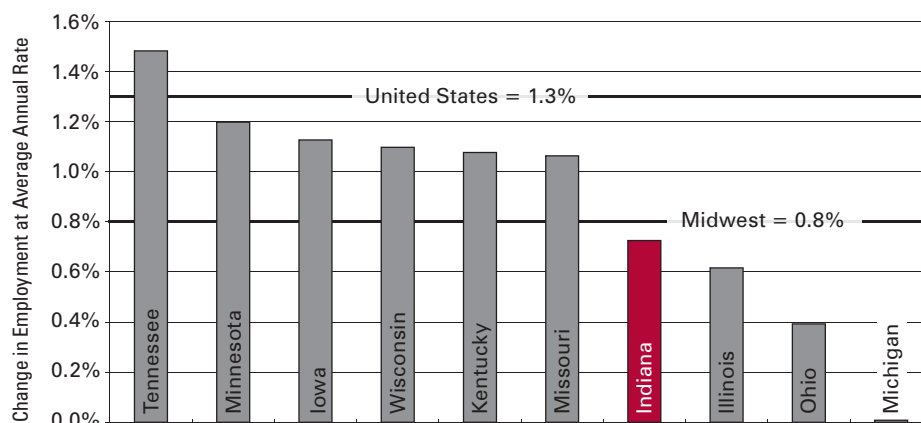
The state also registers a location quotient greater than one for transportation and trade, a sector that serves manufacturing. In some advanced service industries, such as information and education and professional and business services, the state is gaining concentration, though it still lags behind the rest of the nation. In finance, insurance and real estate, another important service

industry, Indiana is behind and is not catching up.

Figure 14 charts the manufacturing industries that saw the biggest numeric gains in current-dollar GDP from 2001 to 2006 together with changes in employment. Despite a barrage of bad news about the auto industry in recent years, Indiana has not lost as many jobs in motor vehicle manufacturing as its neighbors in either absolute numbers or in percentage terms. Michigan and Ohio, for example, lost 92,000 and 24,000 jobs, respectively, from 2001 to 2006 in this sector. This translates to average annual decreases of 7.1 percent and 3.4 percent, respectively.

Even more encouraging is the performance of advanced manufacturing industries. **Figure 14** displays the growth in chemicals and miscellaneous manufacturing, among the other top five growth industries. While computers and electronics manufacturing didn't make it into the top five, it did rank seventh in

■ **FIGURE 11: Employment Growth in the Midwest, 2001 to 2006**



Source: Bureau of Economic Analysis

output growth since 2001. These three industries tend to be knowledge-intensive and may provide greater opportunities for growth. In particular, Indiana's continued focus on life sciences makes it a fertile place to cultivate advanced manufacturing in pharmaceuticals and medical devices.

According to data from the Census Bureau's County Business Patterns, Indiana registered an employment location quotient of 2.07 in 2006 for pharmaceutical and medicine manufacturing. Indiana is third in the nation behind New Jersey and Delaware. The state ranks fourth for medical equipment and supplies manufacturing, with a location quotient of 2.16.

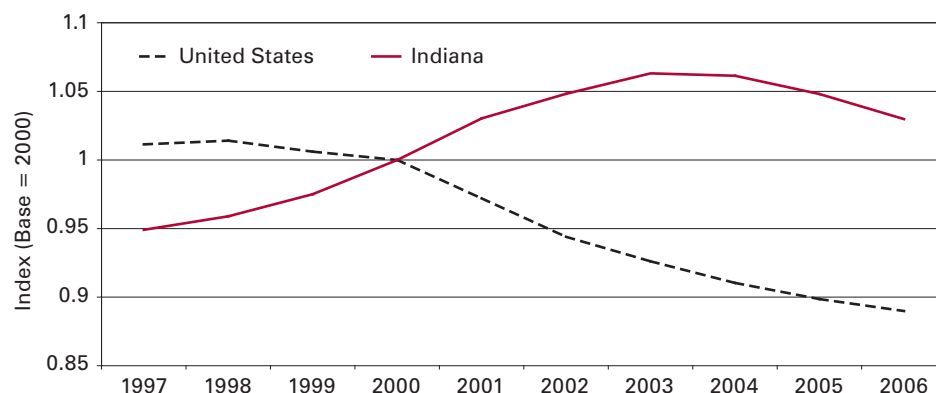
Life sciences and electronics manufacturing provides one way for Indiana to capitalize on its manufacturing resources and translate them into higher paying jobs. Data from the National Science Foundation show that in 2005, the latest year for which data are available, manufacturing industries accounted for 70 percent of total research and development spending. The majority of this research and development was concentrated in chemical manufacturing and, more specifically, pharmaceuticals and medicines. As a national leader in these industries, Indiana stands to gain.

It is difficult to imagine an economic story for Indiana that doesn't center on automobile manufacturing. But, to Indiana's benefit, that story is being rewritten. The future depends on the state's ability to refocus its comparative advantages toward advanced manufactures. ■

Notes

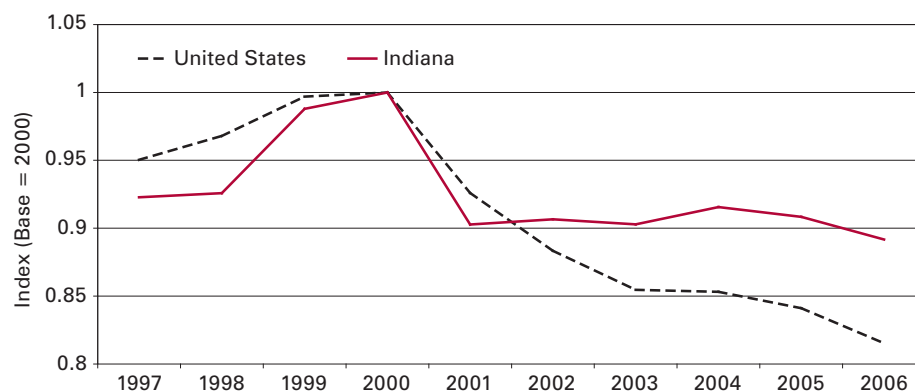
1. Detailed industry data are only available through 2006. Sector-based output data, however, are available through 2007. In all cases, whether employment or output data, the most current data available were used.

■ **FIGURE 12: Chemical Manufacturing Employment Trends—Comparing Indiana to the United States, 1997 to 2006**



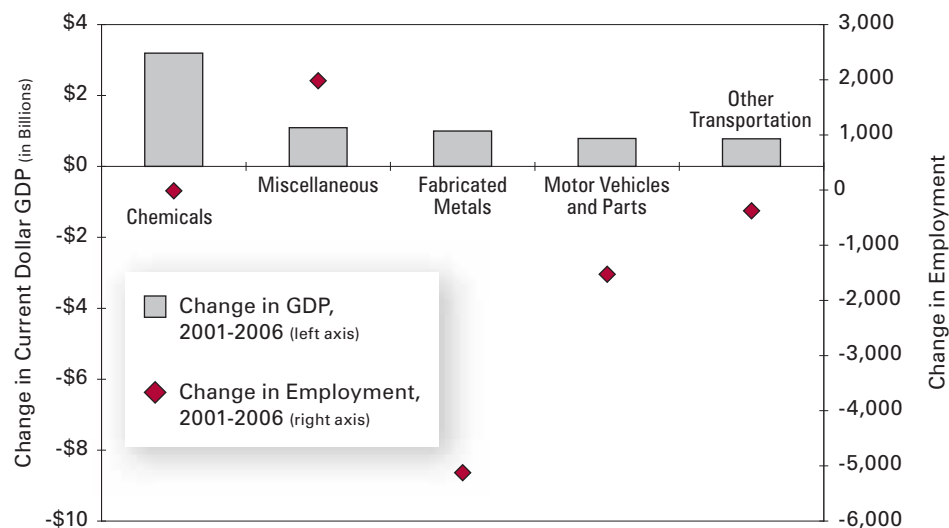
Source: Bureau of Economic Analysis

■ **FIGURE 13: Motor Vehicles and Parts Employment Trends—Comparing Indiana to the United States, 1997 to 2006**



Source: Bureau of Economic Analysis

■ **FIGURE 14: Trends in Indiana Manufacturing Industries with Largest Increases in Output, 2001 to 2006**



Source: Bureau of Economic Analysis

INDIANA BUSINESS REVIEW *Fall 2008*

Inside this Issue

 **Minimum Wage Impacts on Employment: A Look at Indiana, Illinois, and Surrounding Midwestern States**

 **Shifting Gears: Recent Changes in Indiana's Economy**

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