

Indiana's Manufacturing Employment Trends

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This report examines economic and geographic changes to Indiana's key manufacturing sectors over four decades.



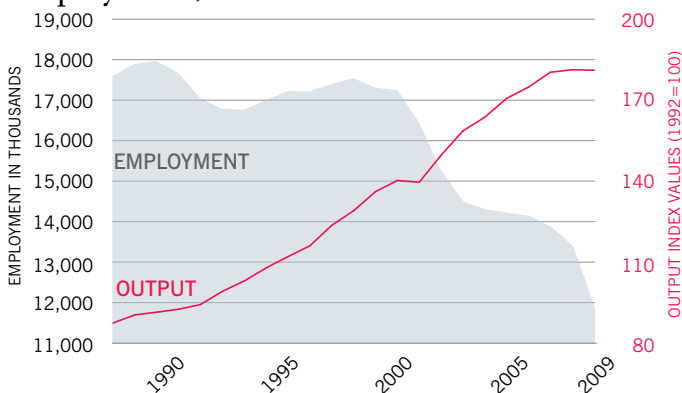
Over the past four decades, employment in Indiana's manufacturing sector has shrunk significantly. However, only half of Indiana counties have experienced job losses in this sector, which raises important questions about the causes and geography of manufacturing job changes. This report examines key trends in the Indiana manufacturing sector at the county level since 1958. It identifies the counties with the highest gains or losses in manufacturing employment and establishments. It also describes the changes in the size of manufacturing establishments. This report begins with a review of factors affecting the level of manufacturing employment in Indiana.

The causes of manufacturing job losses are familiar. Firms downsize their factories, others close establishments, and well trained employees migrate to jobs in other job sec-

tors or states (Glickman et al. 2004). Three factors initiate these changes. The largest of these is the increase in worker productivity (Perry, 2008), but changing consumer tastes for some products and loss of customers to international competition also account for some job losses (Lindsey, 2004 and Bivens, 2004).

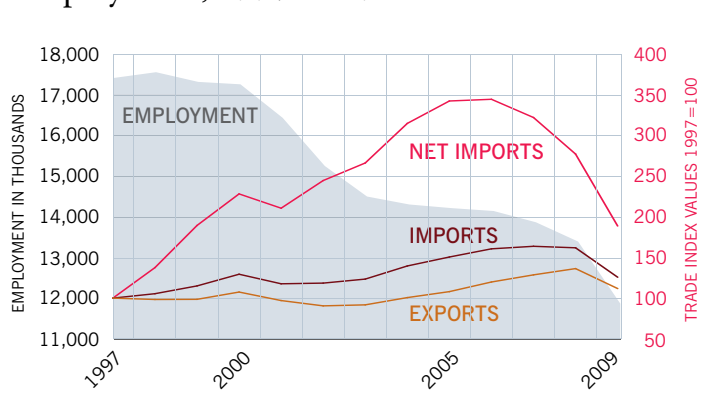
Figure 1 shows the trend in manufacturing productivity (i.e., output per person) and employment from 1987 to 2009 in United States¹. The productivity of manufacturing workers grew by 104.76 percent, while employment decreased 32.52 percent during this period, indicating that fewer workers were needed to produce the same level of output. Unless demand grows roughly at the same rate as productivity, job losses within a particular industry are inevitable.

FIGURE 1
U.S. Manufacturing Output vs. Employment, 1987-2009



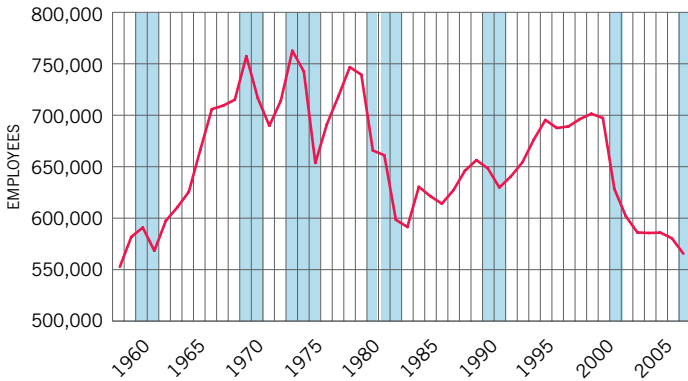
SOURCE: U.S Manufacturing employment and output numbers from Bureau of Labor Statistics. Import² and export³ actual dollar values of manufacturing sector were taken from United States International Trade Commission. The trade index was calculated after adjusting the dollar values for inflation.

FIGURE 2
U.S. Manufacturing International Trade vs. Employment, 1997-2009



1. 1987 is the first year manufacturing productivity data available from BLS
2. Customs value for commodities
3. Free Alongside Ship (FAS) value of commodities

FIGURE 3
State Manufacturing Employment, 1958-2007



NOTE: Shaded area illustrates recession as indicated by National Bureau of Economic Research (NBER). **SOURCE:** Census of Manufacturers (1958 to 1968) and Regional Economic Information System (REIS) (1969 to 2007)

FIGURE 4
Percent Change in State and National Manufacturing Employment, 1959-2007

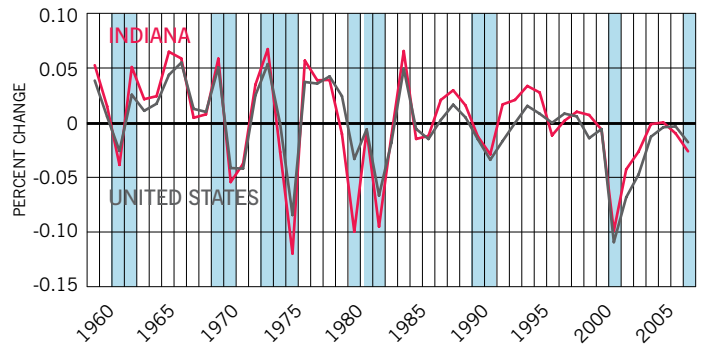
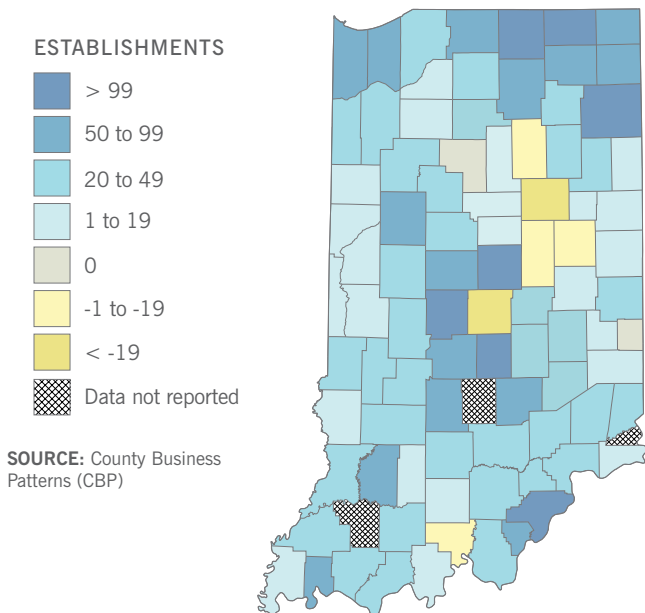
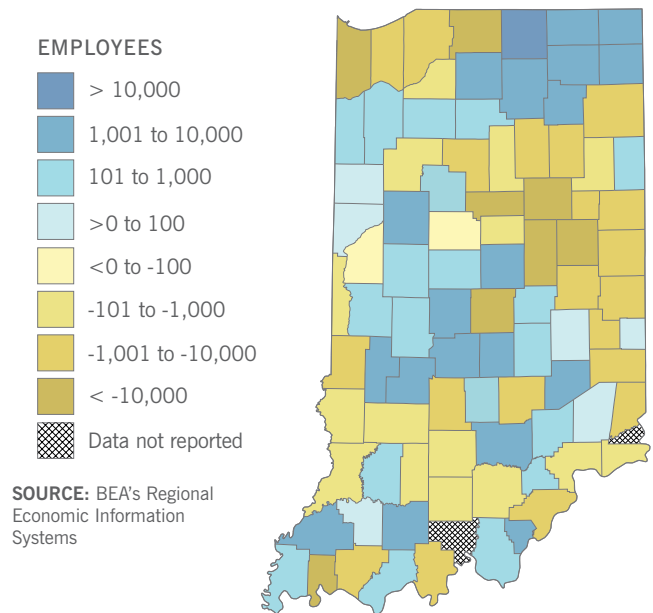


FIGURE 5
Difference in Establishments, 1973-2007



SOURCE: County Business Patterns (CBP)

FIGURE 6
Difference in Employment, 1973-2007



SOURCE: BEA's Regional Economic Information Systems

NOTE: Difference is indicated as the manufacturing establishments in 2007 minus manufacturing establishments in 1973.

Net imports⁴ peaked during 2006 at \$626.7 billion, up by 244.6 percent from 1997 (see Figure 2). In 2009, net imports decreased to \$343.4 billion. During non-recession periods,⁵ manufactured imports increased at a faster pace than exports, and manufacturing employment decreased continually over the entire period irrespective of recession. An in-depth analysis of manufacturing employment and international trade over this period is left for future study.

Between 1969 and 2007, Indiana's overall manufacturing employment, while experiencing both peaks and troughs, declined throughout the period (Figure 3). Indiana's manufacturing employment was highest during 1973, (764,289 jobs).⁶ By 2007, manufacturing employment had dropped 26.2 percent

to 564,077 jobs, the lowest level in the last 49 years.

Figure 4 compares the percentage change in Indiana's manufacturing employment to that of the United States from 1958 to 2007. As shown in the graph, when the manufacturing jobs increased or decreased in the U.S., Indiana followed a similar trend, but with larger variation.

Because Indiana had the highest manufacturing employment in 1973, we compare manufacturing sector data across all 92 counties in Indiana for 1973 and 2007 (Fig. 5 & 6). The number of employees⁷ and establishments⁸ in each manufacturing sector⁹ within all counties were collected for those years.

The counties that suffered the most job losses emerge as a cluster in east central and northwestern Indiana. The north-

4. Net imports = Imports - Exports

5. NBER's recession period – March 2001 to November 2001; December 2007 to ongoing

6. Data taken from Census of Manufacturers for the years 1958 to 1968 and from BEA's Regional Economic Information System (REIS) for the years 1969 to 2007

TABLE 1
Top 10 Indiana Counties in Terms of Highest Gain in Employment

County	Rank	Employees					Establishments				
		1973	2007	Difference	Percent Change	Manufacturing Sector with Highest Gain	1973	2007	Difference	Percent Change	Manufacturing Sector with Highest Gain
Elkhart	1	41,467	64,093	22,626	54.56%	Transportation	583	849	266	45.63%	Fabricated metal
Kosciusko	2	9,316	15,241	5,925	63.60%	Misc. (surgical)	118	197	79	66.95%	Fabricated metal
Dubois	3	7,323	12,198	4,875	66.57%	Furniture & related	82	120	38	46.34%	Furniture & related
Gibson	4	2,652	6,408	3,756	141.63%	Transportation	10	41	31	310.00%	Fabricated metal
Noble	5	5,771	9,369	3,598	62.35%	Transportation	66	136	70	106.06%	Fabricated metal
Johnson	6	3,116	6,064	2,948	94.61%	Transportation	26	133	107	411.54%	Fabricated metal
Dekalb	7	5,587	8,430	2,843	50.89%	Plastics & rubber	52	124	72	138.46%	Fabricated metal
Lagrange	8	3,567	6,382	2,815	78.92%	Wood product	30	145	115	383.33%	Furniture & related
Steuben	9	2,156	4,758	2,602	120.69%	Fabricated metal	16	95	79	493.75%	Fabricated metal
Hamilton	10	3,907	6,449	2,542	65.06%	Transportation	30	194	164	546.67%	Printing & related

TABLE 2
Top 10 Indiana Counties in Terms of Highest Loss in Employment

County	Rank	Employees					Establishments				
		1973	2007	Difference	Percent Change	Manufacturing Sector with Highest Loss	1973	2007	Difference	Percent Change	Manufacturing Sector with Highest Loss
Lake	1	94,400	26,842	-67,558	-71.57%	Primary metal	343	398	55	16.03%	Primary metal
Marion	2	113,932	68,413	-45,519	-39.95%	Machinery, electronics, appliances, etc.	1044	1008	-36	-3.45%	Machinery, electronics, appliances, etc.
Madison	3	28,879	4,471	-24,408	-84.52%	Fabricated metal	124	117	-7	-5.65%	Machinery, electronics, appliances, etc.
Allen	4	47,173	31,479	-15,694	-33.27%	Machinery, electronics, appliances, etc.	378	558	180	47.62%	Food
Vanderburgh	5	27,906	14,127	-13,779	-49.38%	Apparel	216	273	57	26.39%	Food
Grant	6	17,604	4,708	-12,896	-73.26%	Nonmetallic mineral	90	69	-21	-23.33%	Food
Howard	7	25,742	13,376	-12,366	-48.04%	Primary metal	73	75	2	2.74%	Machinery, electronics, appliances, etc.
Delaware	8	16,994	5,645	-11,349	-66.78%	Primary metal	154	149	-5	-3.25%	Machinery, electronics, appliances, etc.
St. Joseph	9	28,833	17,675	-11,158	-38.70%	Machinery, electronics, appliances, etc.	339	423	84	24.78%	Machinery, electronics, appliances, etc.
LaPorte	10	17,496	9,501	-7,995	-45.70%	Machinery, electronics, appliances, etc.	146	183	37	25.34%	Printing & related

SOURCE: Employment data from REIS; establishment data from County Business Patterns.

eastern counties experienced expansion in both employment and establishments.

COUNTY GAINS AND LOSSES

Table 1 shows the ten Indiana counties having the highest growth in manufacturing employment between 1973 and 2007. Elkhart County gained an additional 22,626 jobs, with wood products sector (NAICS 321) as the largest contributor.¹⁰ The number of establishments also increased by 266 in Elkhart County, with fabricated metal products (NAICS 332) adding the most establishments. As shown in Table 1, generally, the employment in transportation equipment (NAICS 336) and establishments in fabricated metal products (NAICS 332) grew the most among these 10 counties. If this

growth is concentrated in only a few industries, these counties become highly susceptible to contractions within those industries, as evidenced in the most recent recession.

Similarly, Table 2 shows the top ten Indiana counties with the greatest losses in manufacturing employment. Lake County lost the most employees (67,558) during 1973-2007, with the primary metal sector (NAICS 331) experiencing the largest losses in jobs and establishments. The machinery, electronic products, computers, electrical appliances and components sectors (NAICS 333, 334 and 335)¹¹ lost the most manufacturing jobs and establishments among these ten counties.

It may be noted from the two preceding tables that in most cases, the sectors accounting for the highest gain/loss

7. Employment data is taken from REIS

8. Establishment data is taken from County Business Patterns (CBP) for the years 1973 and 2007

9. Manufacturing sectors classified according to NAICS code (#31 to 33). For 1973 data, the Manufacturing SIC codes (#20 to 39) were transformed to the equivalent version of NAICS codes.

TABLE 3
Number of Manufacturing Establishments
by Sector, 1973 & 2007

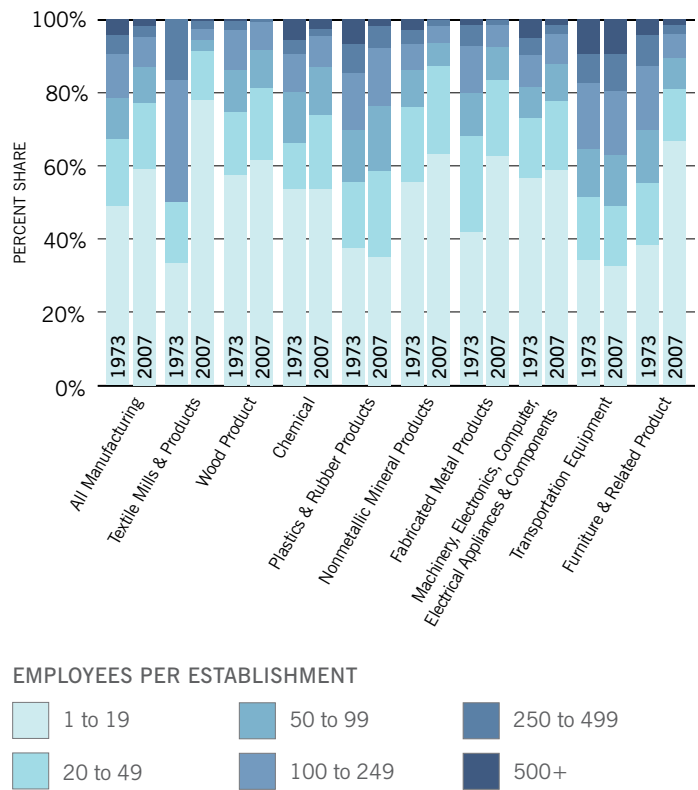
Industry Code Description (NAICS Code)	Total Establishments			
	1973	2007	Difference	Percent Change
<i>Manufacturing</i> (31---, all manufacturing sectors)	5,563	8,956	3,393	60.99%
Food manufacturing (311)	447	477	30	6.71%
Beverage and tobacco product manufacturing (312)	1	55	54	5,400.00%
Textile mills & products (313 & 314)	6	194	188	3,133.33%
Apparel manufacturing (315)	130	75	-55	-42.31%
Leather and allied product manufacturing (316)	21	16	-5	-23.81%
Wood product manufacturing (321)	235	549	314	133.62%
Paper manufacturing (322)	118	166	48	40.68%
Printing and related support activities (323)	618	705	87	14.08%
Petroleum and coal products manufacturing (324)	26	70	44	169.23%
Chemical manufacturing (325)	177	329	152	85.88%
Plastics and rubber products manufacturing (326)	238	535	297	124.79%
Nonmetallic mineral product manufacturing (327)	344	474	130	37.79%
Primary metal manufacturing	268	249	-19	-7.09%
Fabricated metal product manufacturing (331)	707	1872	1,165	164.78%
Machinery, electronic product, computer, electrical appliances and components manufacturing (333, 334 & 335)	1407	1269	-138	-9.81%
Transportation equipment manufacturing (336)	436	681	245	56.19%
Furniture and related product manufacturing (337)	228	564	336	147.37%
Miscellaneous manufacturing (339)	156	676	520	333.33%

in employment differ from those with highest gain/loss in establishments. This suggests that at the county level, there is little or no correlation between manufacturing employment growth and establishment growth.

MANUFACTURING ESTABLISHMENTS

We also examined the number of establishments in each manufacturing sector between 1973 and 2007 for the state (Table 3). While most of the sectors greatly increased the number of establishments; machinery, electronic products, computers, electrical appliances and components sectors (NAICS 333, 334 and 335) lost 138 establishments; apparel (NAICS 315) lost fifty-five; primary metal (NAICS 331) lost nineteen and leather and allied products (NAICS 316) lost

FIGURE 7
Size of Manufacturing Establishments,
1973 & 2007



five. Highest gains were made in the fabricated metal product sector (NAICS 332) adding 1,165 establishments. As manufacturing employment has decreased by more than 200,000 jobs, the number of manufacturing establishments has increased substantially by more than 3,000 establishments.

SIZE OF MANUFACTURING ESTABLISHMENTS

Establishment size is measured by the number of employees. We examine how expansion or downsizing has changed the size of establishments over time. Figure 7 shows the distribution of establishment sizes in Indiana between 1973 and 2007 across major¹² sectors. The size of manufacturing establishments has substantially changed. The percentage of establishments employing 1 to 19 employees increased from 48.9 percent to 59.1 percent for the entire manufacturing sector. This increase of small establishments could be attributed either to downsizing or to an increase in number of small startup companies every year between 1973 and 2007. For most sectors the number of large

10. REIS does not have employment data for each manufacturing sector. Employment and establishment data for each sector is available in County Business Patterns (CBP) for the year 1973, but some of the sectors withheld employment information. From the list of counties with largest gain or loss in manufacturing employment, we then estimated the manufacturing sector that contributed the most to manufacturing employment. This was done by adjusting the 1973 CBP employment numbers to the 1973 REIS total manufacturing numbers and then finding the largest difference between 2007 employment and this adjusted 1973 number for each sector. The resulting sector could have potentially contributed to the growth/decline of manufacturing employment of a county.

11. NAICS #333, 334 and 335 sectors are the combined equivalent SIC Codes # 35, 36 and 38

12. Sectors with the largest increase/decrease in establishments from 1973 to 2007 were treated as "major".

establishments (250+ employees) have decreased while the number and proportion of small companies (less than 50 employees) have increased.

Advances in technology combined with an increase in competition will continue to challenge all manufacturing sectors. It is evident from these trends that gains in employment in one manufacturing sector did not offset the losses in other manufacturing sectors for most Indiana counties. The size of manufacturing establishments has shifted from large establishments to a larger number of smaller establishments. This trend has the potential to add stability to the employment base and tax base of communities.

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