4 Wisconsin's Manufacturing Status

Critical Issues

- How does Wisconsin compare in manufacturing to its competitor states?
- What are its weakest and strongest features in the industry?
- What are the State's priorities among gross product, productivity, capital expenditures, employment, and exports?

Historically and culturally, Wisconsin is a manufacturing state. Many of its earliest industries from the 19th and early 20th century are the same ones that continue to drive its economy today: wood and wood products; food products and processing, including dairy, meats, beverages, grains, fruits, and vegetables; and foundries and transportation equipment,

Early on, Milwaukee became the State's manufacturing center, and as technology progressed through the 20th century, so did the breadth of Wisconsin's manufacturing product lines, adding aerospace, electrical component, medical instruments, farm implements, and audio and video equipment. Its northern ports ". . . accommodate large, oceangoing ships, as well as shipyards and coal and ore docks that are among the largest in the nation."[21]

The Panel and the Survey discussed earlier tell us much about what manufacturers in Wisconsin are thinking in mid-2005 as they consider current business opportunities and those down the road. To put their thoughts into perspective, and to form a better understanding about Wisconsin's prospects in the new, global economy, this Section considers data about its manufacturing performance to date compared to that of its competitors, as well as the United States as a whole. The following data are based on *all* manufacturing industry activity for the years noted.

4.1 Manufacturing in Wisconsin, Eight Competing States, and the U.S.

4.1.1 Manufacturing's Gross Product

The table below shows the manufacturing gross product totals for Wisconsin and the eight competing states in actual dollars for 1993 through 2002, with projections for 2003 through 2004, and the forecast for 2008. Again, U.S. figures are included for comparison.

[21] Wisconsin Historical Society, "The Rise of Skilled Manufacturing," Turning Points in Wisconsin's History, p. 3. See www.wisconsinhistory.org/turningpoints/tp-044/

Table 4-1 Manufacturing Gross Product for Wisconsin, the Eight Competing States, and the U.S., 1993-2008 (Current $1,000)

State	1993	1998	2000	2001	2002	2003	2004	2008
Wisconsin	31,740,790	40,589,410	42,527,520	43,726,060	42,573,110	43,697,750	46,088,050	54,097,360
California	108,481,950	145,739,230	176,441,090	157,413,330	139,617,630	144,280,340	150,661,090	178,630,190
Illinois	53,278,820	65,938,550	66,637,480	62,251,810	57,643,350	58,738,940	60,621,130	71,697,100
Indiana	39,346,410	53,180,750	56,613,040	56,252,960	59,177,200	61,166,920	64,621,220	75,924,010
Michigan	56,998,970	72,216,280	77,875,360	67,855,190	62,481,500	63,583,110	65,309,380	76,328,090
Minnesota	19,328,200	26,299,560	28,915,120	25,985,680	24,928,780	24,658,940	25,482,130	29,993,340
Ohio	69,069,560	86,129,880	84,165,890	80,860,840	76,187,670	77,645,210	80,269,440	93,236,670
Tennessee	27,873,760	33,469,750	35,412,380	37,455,660	37,303,520	39,057,000	41,115,910	48,068,910
Texas	60,635,610	91,914,930	98,757,910	100,370,230	93,440,670	95,038,160	99,645,330	117,705,040
United States	1,039,900,000	1,343,900,000	1,426,200,000	1,341,300,000	1,347,200,000	1,402,300,000	1,495,450,000	1,862,500,000

The percent *change* in gross product for Wisconsin, the eight competing states, and the U.S. appears below.

Table 4-2 Percent Change in Manufacturing Gross Product for Wisconsin, the Eight Competing States, and the U.S., 1993-2008

State	1993-1994	1998-1999	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2007-2008
Wisconsin	6.7%	3.1%	2.8%	-2.6%	2.6%	5.5%	4.5%	3.7%
California	3.1%	9.9%	-10.8%	-11.3%	3.3%	4.4%	4.6%	4.2%
Illinois	14.8%	-0.1%	-6.6%	-7.4%	1.9%	3.2%	4.2%	4.0%
Indiana	8.6%	3.8%	-0.6%	5.2%	3.4%	5.6%	4.2%	4.0%
Michigan	19.7%	7.5%	-12.9%	-7.9%	1.8%	2.7%	3.6%	3.9%
Minnesota	9.2%	4.3%	-10.1%	-4.1%	-1.1%	3.3%	4.4%	3.8%
Ohio	5.4%	-1.5%	-3.9%	-5.8%	1.9%	3.4%	3.7%	3.7%
Tennessee	7.9%	5.4%	5.8%	-0.4%	4.7%	5.3%	4.1%	3.9%
Texas	15.6%	1.7%	1.6%	-6.9%	1.7%	4.8%	4.5%	3.9%
United States	7.6%	2.2%	-6.0%	0.4%	4.1%	6.6%	6.1%	5.2%

While Wisconsin's manufacturing gross product was relatively stable from 1998 through 2002, the United States overall experienced a comparatively large loss in gross product dollar value in 2000-2001. The percent change table above shows substantial decline in manufacturing gross product from 2000 through 2002 for California, Michigan, and Minnesota, with lesser declines for Illinois, Ohio, and Texas (2001-2002). Holding value in gross product, comparatively speaking, were Indiana, Tennessee, and Wisconsin. The data show that these last three states maintained demand for their manufactured goods, while the other competing states lost demand and, therefore, dollars.

4.1.2 Manufacturing's Productivity

Tables 4-3 and 4-4 compare manufacturing productivity for Wisconsin and the eight competing states. Again, the U.S. figures are included for reference.

Table 4-3 Manufacturing Productivity (Gross Product per Employee) for Wisconsin, the Eight Competing States, and the U.S., 1993-2008 (Current $)

State	1993	1998	2000	2001	2002	2003	2004	2008
Wisconsin	60,313	68,419	71,579	78,035	80,585	86,206	89,905	105,358
California	63,990	78,467	94,991	88,143	85,223	93,354	98,523	118,521
Illinois	61,910	72,795	76,544	76,348	76,455	81,852	85,664	103,000
Indiana	64,031	80,978	85,327	91,403	100,585	106,743	113,570	135,499
Michigan	70,738	81,152	86,856	82,794	82,218	87,467	92,560	110,786
Minnesota	55,057	66,252	72,909	68,649	70,060	71,523	73,086	86,528
Ohio	70,425	83,568	82,431	84,842	86,093	91,924	97,142	114,795
Tennessee	55,427	67,118	72,563	82,478	87,072	94,320	99,383	117,293
Texas	64,354	85,316	92,470	97,735	98,486	105,517	112,540	135,841
United States	61,987	76,531	82,603	81,581	88,297	96,658	104,368	132,586

A review of the productivity figures in Table 4-4 shows that Wisconsin is consistently in eighth place in productivity dollar value, except in 2000 when it was in ninth, or last, place. Increased productivity is a goal for managers that may be achieved through changes in management practices, employee training, automation, and other means. Wisconsin's comparatively low productivity values suggest that improvements in worker output could make it more competitive with other states and in global markets. Or, it could mean Wisconsin products are low cost, and therefore workers cannot produce much value per hour no matter how hard they try.

Table 4-4 Percent Change in Manufacturing Productivity (Gross Product per Employee) for Wisconsin, the Eight Competing States, and the U.S., 1993-2008

State	1993-1994	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2007-2008
Wisconsin	2.8%	2.9%	1.7%	9.0%	3.3%	7.0%	4.3%	4.2%
California	3.8%	11.6%	8.5%	-7.2%	-3.3%	9.5%	5.5%	4.7%
Illinois	12.5%	2.5%	2.5%	-0.3%	0.1%	7.1%	4.7%	4.5%
Indiana	6.7%	2.5%	2.8%	7.1%	10.0%	6.1%	6.4%	4.5%
Michigan	13.6%	6.5%	0.5%	-4.7%	-0.7%	6.4%	5.8%	4.5%
Minnesota	6.1%	4.7%	5.1%	-5.8%	2.1%	2.1%	2.2%	4.3%
Ohio	3.0%	-1.2%	-0.2%	2.9%	1.5%	6.8%	5.7%	4.2%
Tennessee	5.5%	6.2%	1.8%	13.7%	5.6%	8.3%	5.4%	4.3%
Texas	12.8%	3.0%	5.2%	5.7%	0.8%	7.1%	6.7%	4.4%
United States	6.0%	3.6%	4.2%	-1.2%	8.2%	9.5%	8.0%	5.8%

Given these data for gross product and productivity, and the State's employment losses (discussed below), what does their interrelationship suggest during this recent economic period? Some economists conclude that successful gross product and productivity numbers with falling employment during the recession actually represent the benefits of previous capital investments and workplace reorganization, in effect replacing workers with efficiency.[22] If so, a tailing off of growth would be expected as those capital investments age and capital expenditures decline, as shown in Table 4-5. To reverse that trend and be more competitive, Wisconsin would have to continue to find the means for increasing gross product and productivity in the face of a jobless recovery.

[22] Federal Reserve Bank of San Francisco, "Gains in U.S. Productivity: Stopgap Measures or Lasting Change?" FRBSF Economic Letter 2005-05, March 11, 2005, p. 1. See www.frbsf.org/publications/economics/letter/2005/el2005-05.html

4.1.3 Manufacturing's Capital Expenditures

Capital expenditures have traditionally been an early indicator of a commitment to manufacturing. Although Wisconsin and its competitor states vary widely in numbers of manufacturers and total top line revenues, a state's manufacturing mix also affects capital expenditures. Some high-end value products require costly investment in technology (e.g., computers and nanotechnology), while many low-end value products—commodities or products heading toward commoditization—rely more on labor than capital investment (e.g., old economy logging or parts assembly).

Table 4-5 gives an historic overview of capital expenditures in manufacturing for machinery and equipment from 1998 through 2003 by Wisconsin, the eight competing states, and the U.S. It clearly shows the effects of the recession of 2001 on total capital expenditures for all manufacturing establishments in the U.S. Generally, investments peaked in 2000, and then began falling some 25% over the period 2001 through 2003.

Table 4-5 Total Capital Expenditures for Machinery & Equipment—Wisconsin, Eight Competing States, and U.S., 1998-2003* (Current $1,000)

State	1998	1999	2000	2001	2003
Wisconsin	$3,659,790	$3,738,312	$3,802,200	$3,172,983	$2,849,091
California	$12,880,128	$12,798,238	$13,959,348	$13,266,095	$10,342,634
Illinois	$6,751,595	$6,060,366	$6,193,905	$5,490,003	$4,548,752
Indiana	$4,666,651	$5,608,098	$5,300,293	$4,436,840	$4,018,563
Michigan	$8,918,779	$7,945,507	$7,169,598	$6,260,643	$4,769,669
Minnesota	$2,751,113	$2,751,113	$2,548,154	$4,086,699	$2,214,281
Ohio	$7,603,598	$7,670,181	$7,508,397	$6,393,081	$5,177,214
Tennessee	$3,793,943	$3,313,936	$3,243,591	$4,086,699	$3,212,485
Texas	$10,018,334	$10,617,428	$12,176,540	$9,747,641	$8,196,328
U.S.	$128,212,906	$127,252,067	$130,366,938	$117,499,242	$97,315,758

*Comparable data for 2002 not available from the U.S. Census Bureau.

Source: Table 3: Supplemental Statistics for the United States and States, Geographic Area Statistics, Annual Survey of Manufacturers, U.S. Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau, Years 1998, 1999, 2000, 2001, and 2003.

The question for manufacturers to consider when thinking about future capital expenditures is how that investment will keep current customers and attract new ones by providing solutions and value bundles that the new economy's buyers demand. Gathering information about the customer base and its needs and continuously probing for changes in how customer problems can be solved better by one's product and bundle of services can be one of the most important investments manufacturers can make in the new economy. To increase their top line revenues, manufacturers will have to strike a balance between investing in traditional capital and investing in intellectual capital, the information about the intangibles of the business, including customers, competitors, and how the industry is changing. In the new economy, information is as valuable to customers as the product. Among competing manufacturers with comparable products, those who succeed will help their customers shorten their to-do lists and help deliver top line revenue.

4.1.4 Manufacturing's Employment

Table 4-6 below compares Wisconsin's manufacturing employment figures for 1993-2008 with those of its competitor states. The U.S. figures are included to give a dimension to the portion each state contributes to the total U.S. employment in manufacturing.

Table 4-6 Manufacturing Employment—Wisconsin, Eight Competing States, and U.S., 1993-2008

State	1993	1998	2000	2001	2002	2003	2004	2008
Wisconsin	526,270	593,250	594,130	560,340	528,300	506,900	512,630	513,460
California	1,695,300	1,857,340	1,857,460	1,785,890	1,638,270	1,545,520	1,529,190	1,507,160
Illinois	860,580	905,810	870,580	815,370	753,950	717,620	707,660	696,090
Indiana	614,490	656,730	663,480	615,440	588,330	573,030	569,000	560,330
Michigan	805,780	889,890	896,600	819,570	759,950	726,940	705,590	688,970
Minnesota	351,060	396,960	396,590	378,530	355,820	344,770	348,660	346,630
Ohio	980,750	1,030,660	1,021,050	953,070	884,950	844,670	826,310	812,200
Tennessee	502,890	498,670	488,020	454,130	428,420	414,090	413,710	409,820
Texas	942,220	1,077,350	1,068,000	1,026,960	948,770	900,690	885,420	866,490
9 State Total	**7,279,340**	**7,906,660**	**7,855,910**	**7,409,300**	**6,886,760**	**6,574,230**	**6,498,170**	**6,401,150**
U.S. Total	**16,776,170**	**17,560,170**	**17,265,670**	**16,441,250**	**15,257,670**	**14,507,920**	**14,328,580**	**14,047,480**
9 State % of U.S.	43.4%	45%	45.5%	45.1%	45.1%	45.3%	45.4%	45.6%

Total employment for all nine states shows that, together, year to year, they employ some 45% of the total U.S. workforce in manufacturing.

Percent *change* in employment figures—in actual numbers, projected, and forecast—follows in Table 4-7.

Table 4-7 Percent Change in Manufacturing Employment—Wisconsin, Eight Competing States, & U.S., 1993-2008

State	1993-1994	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2007-2008
Wisconsin	3.8%	-0.1%	-5.7%	-5.7%	-4.1%	1.1%	1.2%	-0.4%
California	-0.7%	1.5%	-3.9%	-8.3%	-5.7%	-1.1%	0.1%	-0.4%
Illinois	2.0%	-1.3%	-6.3%	-7.5%	-4.8%	-1.4%	-0.5%	-0.5%
Indiana	1.8%	-0.2%	-7.2%	-4.4%	-2.6%	-0.7%	0.0%	-0.5%
Michigan	5.3%	-0.2%	-8.6%	-7.3%	-4.3%	-2.9%	-0.7%	-0.5%
Minnesota	2.9%	0.3%	-4.6%	-6.0%	-3.1%	1.1%	0.5%	-0.4%
Ohio	2.3%	-0.6%	-6.7%	-7.1%	-4.6%	-2.2%	-0.3%	-0.5%
Tennessee	2.2%	-1.4%	-6.9%	-5.7%	-3.3%	-0.1%	0.5%	-0.4%
Texas	2.5%	0.4%	-3.8%	-7.6%	-5.1%	-1.7%	-0.8%	-0.5%
United States	1.5%	-0.3%	-4.8%	-7.2%	-4.9%	-1.2%	-0.1%	-0.6%

The years of interest in Table 4-7 are the three columns for 2000-2003. Every state lost manufacturing employment during those years: the greatest loss by Michigan, the least, by Minnesota, as shown by the *average* of their three-year losses: Michigan, -6.7%; Illinois, -6.2%; Ohio, -6.1%; Texas, -5.5%; Tennessee, -5.3%; Wisconsin, -5.2%; Indiana, -4.7%; and Minnesota, -4.6. By comparison, the average loss in manufacturing employment for the U.S. over that three-year period was -5.6%. Generally, all states began to reduce job losses in 2002-2003.

Wisconsin fared slightly better than the U.S. in manufacturing job losses from 1998 through 2002. In addition to the effects of the 2001 recession, an Economic Policy Institute briefing paper accounts for manufacturing job losses with these numbers: "From 1998 to 2003, 3.04 million jobs were lost in manufacturing, with rising net imports accounting for about 1.78 million of them. Between 2000 and 2003, 2.70 million jobs were lost in manufacturing, with rising net manufactured imports explaining about 950,000 of this decline."[23] The report continues with these observations:

> While demand for manufacturing output has remained constant (or even grown) as a share of the U.S. economy, *production* of manufactured goods has lagged this demand by a widening margin in recent years. This 'wedge' between demand and production means that manufacturing purchases by U.S. consumers and businesses do not translate into expanded employment output.
>
> This wedge is equal to net imports.[24]

4.1.5 Exports in Wisconsin's Driver Industries

Data is from the Harris InfoSource database, 2005. These data are available only at the NAICS 3-digit level, so precise figures for the 4-digit codes are unavailable. These data do, however, suggest trends in U.S. exports in the manufacturing sectors summarized below, and allow for a snapshot comparison of how Wisconsin is doing relative to the eight competing states in total dollars exported, U.S. market share, and in percent change from 2003 to 2004.

In nine of the 10 driver categories, Wisconsin's exports increased from 2003 in 2004. The exception was in Food Manufacturing.

Table 4-8 Food Manufacturing Exports—NAICS 311 (Drivers 3114, 3115) (Current $)

					% Share			% Change
State	Rank	2002	2003	2004	2002	2003	2004	2004/2003
Wisconsin	17	571,707,154	650,636,182	560,428,540	2.21	2.37	2.1	-13.86
California	1	3,550,885,719	4,168,177,618	4,158,863,829	13.7	15.2	15.6	-0.22
Illinois	5	1,205,544,503	1,297,199,528	1,302,394,791	4.66	4.72	4.89	0.4
Indiana	31	212,903,396	247,657,812	207,748,308	0.82	0.9	0.78	-16.11
Michigan	21	315,169,690	422,286,397	397,852,428	1.22	1.54	1.49	-5.79
Minnesota	9	700,454,666	731,190,128	870,591,880	2.71	2.66	3.27	19.07
Ohio	19	506,464,697	470,857,208	445,054,340	1.96	1.71	1.67	-5.48
Tennessee	22	204,703,448	284,575,373	310,620,896	0.79	1.03	1.17	9.15
Texas	2	2,490,043,699	2,755,198,756	2,648,433,291	9.63	10	9.94	-3.88
United States		25,855,503,616	27,495,603,579	26,645,578,031	100	100	100	-3.09

Wisconsin's food exports declined massively in 2004 because Japan, China, and South Korea likely began purchasing food products from Asian sources, rather than from the U.S., presumably for reasons of cost due to lower labor rates. It would be useful to learn what food

[23] J. Bivens, "Shifting Blame for the for Manufacturing Job Loss: Effects of Rising Trade Deficit Shouldn't Be Ignored. Economic Policy Institute Briefing Paper, #149, April 8, 2004, p. 4.
[24] J. Bivens, p. 3.

products Minnesota is exporting and to where. The future here lies in niche markets where global commoditization has not taken place.

Table 4-9 Wood Product Manufacturing Exports—NAICS 321 (Drivers 3211, 3212, 3219) (Current $)

					% Share			% Change
State	Rank	2002	2003	2004	2002	2003	2004	2004/2003
Wisconsin	18	81,840,546	87,478,319	95,258,811	2.07	2.17	2.12	8.89
California	1	392,725,549	402,697,622	422,645,962	9.95	9.98	9.41	4.95
Illinois	28	39,381,350	42,664,920	37,472,737	1	1.06	0.83	-12.17
Indiana	10	126,311,646	134,269,287	145,784,906	3.2	3.33	3.25	8.58
Michigan	13	89,128,375	110,227,199	130,673,875	2.26	2.73	2.91	18.55
Minnesota	23	83,559,719	74,330,266	74,912,555	2.12	1.84	1.67	0.78
Ohio	7	162,094,209	179,027,359	199,237,391	4.11	4.44	4.44	11.29
Tennessee	21	75,932,222	73,912,658	84,597,637	1.92	1.83	1.88	14.46
Texas	11	100,662,100	132,746,160	144,524,620	2.55	3.29	3.22	8.87
United States		3,948,151,881	4,036,281,435	4,491,569,114	100	100	100	11.28

Wisconsin's wood product exports increased modestly in 2004, but global competition for the low-end furniture markets (Walmart, IKEA, Target) and other wood products (Home Depot, Lowe's) will continue to commoditize manufactured wood products. Key to increasing exports will be finding higher-end products that have appeal in global markets and cannot be challenged by low-labor economies.

Table 4-10 Paper Manufacturing Exports—NAICS 322 (Drivers, 3221, 3222) (Current $)

					% Share			% Change
State	Rank	2002	2003	2004	2002	2003	2004	2004/2003
Wisconsin	7	528,315,412	563,186,987	664,923,606	3.74	3.88	4.23	18.06
California	3	1,051,420,085	1,069,151,280	1,148,854,547	7.45	7.37	7.3	7.45
Illinois	13	510,566,868	489,863,365	479,889,320	3.62	3.38	3.05	-2.04
Indiana	30	99,618,586	125,546,777	123,515,953	0.71	0.87	0.79	-1.62
Michigan	22	232,519,111	298,675,876	290,157,965	1.65	2.06	1.84	-2.85
Minnesota	20	244,315,979	263,407,830	296,979,251	1.73	1.82	1.89	12.75
Ohio	11	447,246,774	492,394,435	563,460,767	3.17	3.39	3.58	14.43
Tennessee	17	425,916,328	332,432,383	382,898,550	3.02	2.29	2.43	15.18
Texas	2	1,133,475,070	1,234,343,335	1,373,033,125	8.03	8.51	8.73	11.24
United States		14,107,299,427	14,504,183,330	15,731,828,692	100	100	100	8.46

Wisconsin is the nation's number one paper and paper products producer, and though its total output has declined in recent years, it has found new opportunities in exports. It had the greatest increase in exports compared to the competitor states and the U.S. Its success warrants exploration of market trends where it can succeed with new economy strategies.

Table 4-11 Chemical Manufacturing Exports—NAICS 325 (Driver 3256) (Current $)

State	Rank	2002	2003	2004	% Share 2002	% Share 2003	% Share 2004	% Change 2004/2003
Wisconsin	27	589,793,200	585,331,646	638,795,212	0.73	0.64	0.59	9.13
California	3	5,417,794,765	5,963,655,321	6,644,089,654	6.73	6.55	6.12	11.41
Illinois	6	3,517,530,829	3,890,966,685	4,617,181,607	4.37	4.27	4.26	18.66
Indiana	9	2,440,535,003	3,005,403,239	3,678,569,978	3.03	3.3	3.39	22.4
Michigan	14	2,822,618,232	2,785,333,789	3,059,097,130	3.51	3.06	2.82	9.83
Minnesota	29	410,406,046	480,715,943	617,757,451	0.51	0.53	0.57	28.51
Ohio	10	2,532,405,477	2,834,381,299	3,417,832,346	3.15	3.11	3.15	20.58
Tennessee	17	1,583,631,572	1,723,443,326	2,139,338,461	1.97	1.89	1.97	24.13
Texas	1	15,002,401,622	17,125,246,559	22,564,307,455	18.6	18.8	20.8	31.76
United States		80,504,165,962	91,017,177,975	108,484,042,230	100	100	100	19.19

In this category, Wisconsin has only one driver industry from the total of seven 4-digit categories, Soap, Cleaning Compounds, and Toilet Preparations. Though it is lowest in percent growth, it is doing reasonably well, given the range and number of chemical products other states manufacture and export.

Table 4-12 Non-Metallic Mineral Product Manufacturing Exports—NAICS 327(Driver 3272)(Current $)

State	Rank	2002	2003	2004	% Share 2002	% Share 2003	% Share 2004	% Change 2004/2003
Wisconsin	25	56,486,022	57,190,747	58,747,808	0.89	0.89	0.85	2.72
California	2	733,412,096	540,007,083	592,648,046	11.59	8.43	8.56	9.75
Illinois	7	239,154,380	294,715,931	327,414,128	3.78	4.6	4.73	11.09
Indiana	13	161,473,298	177,943,172	172,325,885	2.55	2.78	2.49	-3.16
Michigan	5	474,409,941	473,046,842	510,181,173	7.5	7.39	7.37	7.85
Minnesota	18	166,464,088	109,287,126	138,635,938	2.63	1.71	2	26.85
Ohio	1	585,453,145	692,292,308	712,925,935	9.26	10.81	10.3	2.98
Tennessee	15	132,302,558	147,519,275	160,429,677	2.09	2.3	2.32	8.75
Texas	3	557,614,940	540,798,498	568,916,627	8.82	8.44	8.22	5.2
United States		6,325,735,662	6,405,335,115	6,924,574,568	100	100	100	8.11

Wisconsin's driver in this category is Glass and Glass Products Manufacturing, which is beginning to show only modest gains in the global market. Altogether, there are five 4-digit NAICS industry categories, so Wisconsin is competing with only 20% of the potential exports. If it is to be profitable globally, it will need to examine the foreign markets for products such as tempered, insulated, and other window and door glass products, and cultivate the high-end niches.

Table 4-13 Primary Metal Manufacturing Exports—NAICS 331 (Driver 3315) (Current $)

State	Rank	2002	2003	2004	% Share 2002	% Share 2003	% Share 2004	% Change 2004/2003
Wisconsin	31	95,709,250	108,745,102	145,268,217	0.57	0.57	0.64	33.59
California	5	1,012,986,853	1,167,545,304	1,339,973,500	6.07	6.1	5.88	14.77
Illinois	11	511,895,451	574,193,637	702,533,587	3.07	3	3.08	22.35
Indiana	10	526,297,707	612,346,471	775,973,020	3.15	3.2	3.4	26.72

State	Rank	2002	2003	2004	% Share 2002	% Share 2003	% Share 2004	% Change 2004/2003
Michigan	9	838,154,156	912,806,536	1,214,924,358	5.02	4.77	5.33	33.1
Minnesota	39	53,654,969	50,389,958	44,416,283	0.32	0.26	0.19	-11.85
Ohio	8	884,966,484	1,001,276,989	1,264,062,353	5.3	5.24	5.55	26.25
Tennessee	19	266,067,656	254,384,211	337,448,354	1.59	1.33	1.48	32.65
Texas	1	2,080,901,968	2,097,170,031	2,860,885,721	12.5	11	12.6	36.42
United States		16,688,673,921	19,125,021,388	22,790,336,361	100	100	100	19.17

Foundry exports have increased markedly in Wisconsin. There are five NAICS 4-digit industries here—steel and alumina and other metal processing and products. While driver analysis shows this industry in negative numbers in output in the State, it has found foreign buyers, though the overall dollar amount is small. Nonetheless, it suggests an export area worth further research.

Table 4-14 Fabricated Metal Products Manufacturing Exports—NAICS 332 (Drivers 3321, 3322, 3325, 3327, 3329) (Current $)

State	Rank	2002	2003	2004	% Share 2002	% Share 2003	% Share 2004	% Change 2004/2003
Wisconsin	15	381,119,904	352,939,008	422,332,369	1.89	1.73	1.87	19.66
California	2	2,157,888,964	2,298,693,639	2,590,193,025	10.7	11.3	11.5	12.68
Illinois	6	957,515,655	1,077,459,224	1,159,746,832	4.74	5.29	5.13	7.64
Indiana	12	494,115,564	482,654,269	525,961,511	2.45	2.37	2.33	8.97
Michigan	5	1,219,239,358	1,200,515,998	1,244,218,496	6.04	5.9	5.5	3.64
Minnesota	21	288,088,764	310,274,163	341,537,958	1.43	1.52	1.51	10.08
Ohio	3	1,736,506,090	1,728,344,660	1,692,925,522	8.6	8.49	7.49	-2.05
Tennessee	16	357,419,153	353,132,710	407,240,257	1.77	1.73	1.8	15.32
Texas	1	2,935,686,823	3,073,005,139	3,456,920,880	14.5	15.1	15.3	12.49
United States		20,186,682,206	20,364,725,147	22,614,074,928	100	100	100	11.05

Wisconsin led its competitors and the U.S. in growth in this sector, though its total revenues were sixth among its competitors. In a field of nine 4-digit industries in NAICS 332, Wisconsin has five drivers. One industry commentator sees continued U.S. success in this market as long as there is continued global economic recovery and a weaker dollar.[25]

Table 4-15 Machinery Manufacturing Exports—NAICS 333 (Drivers 3331, 3332, 3333, 3335, 3339) (Current $)

State	Rank	2002	2003	2004	% Share 2002	% Share 2003	% Share 2004	% Change 2004/2003
Wisconsin	6	2,978,712,644	3,217,463,021	3,714,962,788	3.97	4.29	4.01	15.46
California	2	9,517,571,204	9,433,879,999	12,592,999,285	12.7	12.6	13.6	33.49
Illinois	3	6,528,324,168	6,892,917,239	8,528,414,361	8.71	9.2	9.2	23.73
Indiana	8	2,350,677,954	2,441,369,969	2,883,636,050	3.14	3.26	3.11	18.12
Michigan	7	3,583,611,733	3,372,049,454	3,680,258,177	4.78	4.5	3.97	9.14
Minnesota	13	1,374,355,639	1,490,721,065	1,882,008,457	1.83	1.99	2.03	26.25
Ohio	5	3,702,069,989	3,595,682,003	4,419,391,011	4.94	4.8	4.77	22.91

[25] Richard W. Judy, Who Is Manufacturing Tomorrow's Jobs?, Workforce Associates, Inc., February 2005, p.2. See editor.ne16.com/htmleditor/viewonline.asp?FileID=12007

State	Rank	2002	2003	2004	% Share 2002	% Share 2003	% Share 2004	% Change 2004/2003
Tennessee	18	1,220,511,498	1,264,939,095	1,408,137,625	1.63	1.69	1.52	11.32
Texas	1	12,602,234,219	11,407,672,253	14,609,762,185	16.8	15.2	15.8	28.07
United States		74,945,292,363	74,925,131,610	92,673,993,772	100	100	100	23.69

The global economics of fabricated metals also apply to machinery manufacturing—i.e., a weaker dollar and a continued global economic recovery will keep exports in NAICS 333 healthy.[26] Wisconsin has five of the seven industry sectors in this category, and its overall exports sales are very good compared to its competitors. This is an export area deserving of further research for expanding markets, especially while recovery is underway, to form new global customer bases that will help this sector weather economic downturns.

Table 4-16 Electrical Equipment, Appliance, and Component Manufacturing Exports—NAICS 335 (Drivers 3353, 3359) (Current $)

State	Rank	2002	2003	2004	% Share 2002	% Share 2003	% Share 2004	% Change 2004/2003
Wisconsin	12	519,287,580	548,560,875	653,287,439	2.27	2.36	2.44	19.09
California	2	2,988,510,372	2,936,388,740	3,440,160,747	13.1	12.6	12.8	17.16
Illinois	3	1,625,312,026	1,710,591,373	1,792,495,677	7.11	7.34	6.68	4.79
Indiana	14	505,185,014	545,716,920	620,357,930	2.21	2.34	2.31	13.68
Michigan	10	645,309,646	739,611,130	765,022,324	2.82	3.18	2.85	3.44
Minnesota	25	313,234,412	289,385,492	371,207,954	1.37	1.24	1.38	28.27
Ohio	4	1,044,892,024	1,092,246,797	1,242,409,507	4.57	4.69	4.63	13.75
Tennessee	19	462,257,753	460,792,982	461,885,797	2.02	1.98	1.72	0.24
Texas	1	4,604,995,237	4,642,580,101	5,332,133,233	20.2	19.9	19.9	14.85
United States		22,848,272,994	23,291,635,958	26,828,083,360	100	100	100	15.18

At the state driver level, Wisconsin's Electrical Equipment and Other Electrical Equipment and Components have shown remarkable growth and increasing concentration, which its growth in exports in 2004 reflects. Its percent increase in this sector is second only to Minnesota, and its overall revenues nearly double that of Minnesota.

Table 4-17 Transportation Equipment Manufacturing Exports—NAICS 336 (Drivers 3362, 3369) (Current $)

State	Rank	2002	2003	2004	% Share 2002	% Share 2003	% Share 2004	% Change 2004/2003
Wisconsin	22	1,108,515,601	1,374,288,045	1,518,503,002	0.85	1.07	1.08	10.49
California	4	7,099,717,690	8,643,619,605	11,759,483,727	5.42	6.71	8.37	36.05
Illinois	14	3,254,389,560	2,950,212,946	3,146,466,247	2.49	2.29	2.24	6.65
Indiana	6	4,785,957,956	5,273,477,563	6,206,832,640	3.66	4.09	4.42	17.7
Michigan	1	19,582,756,000	18,086,120,532	18,498,572,174	15	14	13.2	2.28
Minnesota	26	1,061,055,501	1,141,149,410	1,188,741,376	0.81	0.89	0.85	4.17
Ohio	5	11,219,988,416	12,502,378,350	11,294,915,273	8.57	9.7	8.04	-9.66
Tennessee	12	2,765,938,909	2,390,988,760	3,337,897,300	2.11	1.86	2.38	39.6
Texas	3	10,507,662,862	9,902,791,603	12,576,894,508	8.03	7.69	8.96	27

[26] Richard W. Judy, p. 2.

State	Rank	2002	2003	2004	% Share 2002	% Share 2003	% Share 2004	% Change 2004/2003
United States		130,897,140,664	128,854,240,130	140,439,444,352	100	100	100	8.99

Individually, Wisconsin's Other Transportation Equipment driver (3369) leads all others in terms of both growth and competitiveness, predicting rising exports as well. While Wisconsin has only two of the seven 4-digit NAICS industries as drivers, next to machinery manufacturing exports, this is the State's most revenue-generating category in the global marketplace.

In summary, Wisconsin is competing well or exceeding many of its competitors in percent growth figures in its recent export activity. The greatest to least revenue producing export areas for 2004 at the 3-digit NAICS level of its drivers are these:

Rank	NAICS 3-Digit Category	Total 2004 Export Revenues
1st	Machinery Mfg	$3,714, 962,788
2nd	Transportation Equipment Mfg.	$1,518,503,002
3rd	Paper Mfg.	$ 664,923,606
4th	Electrical Eqpt., Appliance, Component Mfg.	$ 653,287,439
5th	Chemical Mfg.	$ 638,795,212
6th	Food Mfg.	$ 560,428,540
7th	Fabricated Metal Products Mfg.	$ 422,332,369
8th	Primary metal Mfg.	$ 145,268,217
9th	Wood Products Mfg.	$ 95,258,811
10th	Non-Metallic Mineral Product Mfg.	$ 58,747,808

The discussion below on Drivers and Clusters will suggest ways in which Wisconsin must support struggling driver industries to help them compete more successfully nationally and internationally.

Critical Issues

- How can Wisconsin manufacturers improve the competitiveness of their food products globally?
- What means can manufacturers use to parse the export data into strategies to develop customer-focused strategies, and business solutions that improve customer top line revenues?
- How can Wisconsin's manufacturers mine the critical information in today's global economy to develop short- and long-term business strategies that create value-added products and services that can weather economic change?