

POPULATION NOTES

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Manufacturing Is Big Business in Minnesota

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Manufacturing has been a major contributor to Minnesota's strong economy. Data from the 1992 Economic Census indicates that between 1982 and 1992, jobs in manufacturing increased 11.3 percent; the value of shipments of manufactured goods grew by 17.1 percent, when adjusted for inflation; and payroll for all workers in manufacturing increased 21.8 percent, adjusted for inflation. In 1992, production workers in manufacturing earned average hourly wages of \$11.97. According to Bureau of Economic Analysis data for 1990 through 1994, manufacturing employed about 15 percent of Minnesota's work force, compared with slightly more than 13 percent nationally, and about 17 percent of all personal income in Minnesota came from manufacturing. The contrast with national data is marked. Between 1982 and 1992, the na-

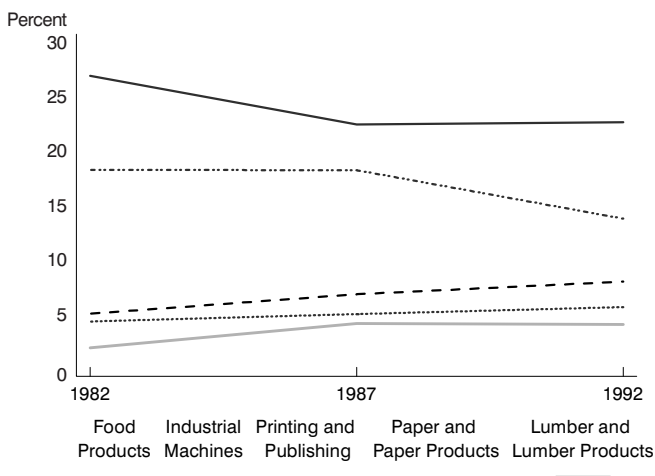
Highlights at a Glance...

- Minnesota added 39,700 manufacturing jobs between 1982 and 1992, at the same time the nation lost jobs in manufacturing.
- The value of manufacturing shipments grew 17.1 percent from 1982 to 1992, after adjusting for inflation.
- Food processing produces the highest dollar amount of manufactured products in Minnesota, but its share is decreasing.
- Wages for manufacturing production workers declined relative to inflation between 1982 and 1992.

tion lost more than 900,000 manufacturing jobs, a decline of 4.8 percent. Personal income from manufacturing grew only 5.7 percent (after adjusting for inflation) nationally, much slower than the 24.1 percent growth in Minnesota.

Manufacturers in Minnesota shipped goods worth more than \$57 billion in 1992, according to the Economic Census. Nearly 8,000 manufacturing establishments employed close to 400,000 people. Annual payroll in 1992 was \$12.6 billion, and employees in manufacturing averaged annual earnings of \$23,980, or \$3,500 more than per capita personal income for the state.

Percent of Total Value of Shipments by Sector



Source: Economic Census, 1982, 1987 and 1992



The three manufacturing sectors with the largest dollar value of shipments were food processing, industrial machinery and equipment, and printing and publishing. Food processing is the biggest manufacturing sector in Minnesota, but in recent years its share has dropped as printing and publishing, paper production and lumber increased their shares. Manufacture of industrial machinery has also lost share since 1982. In 1992, food processing shipped 22.3 percent of the value of all manufactured goods, industrial machines made up 13.8 percent and printing and publishing another 8.3 percent. Fabricated metals and paper products were 8 and 6.1 percent, respectively, of the value of all goods shipped.

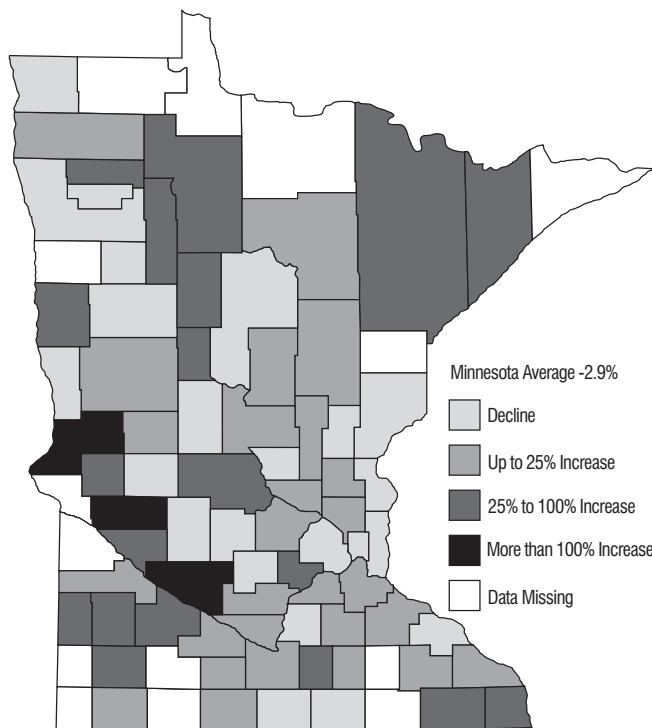
Minnesota had a total of 7,931 manufacturing establishments in 1992. Each of these establishments employed on average about 49 people, but the number of employees varied from sector to sector. Paper production plants employed more people on average — 134 people per establishment — than plants in any other sector. Plants making instruments and electronic equipment averaged about 90 employees. Printing and publishing establishments had only about 30 employees, industrial machine shops 42 and food processors 77. Establishments making apparel and textile products had the fewest employees on average — 15 per plant.

Production worker wages varied widely from sector to sector and county to county. Workers in apparel manufacturing earned a statewide average of only \$7 per hour in 1992, while workers in petroleum and coal processing earned \$18.87. Production workers averaged \$11.97 in 1992, and most sectors paid wages within \$1.50 of that average. Exceptions were rubber and plastic production at \$10.33 an hour and paper production at \$14.91 an hour.

Manufacturing Expands in Rural Areas Since 1987

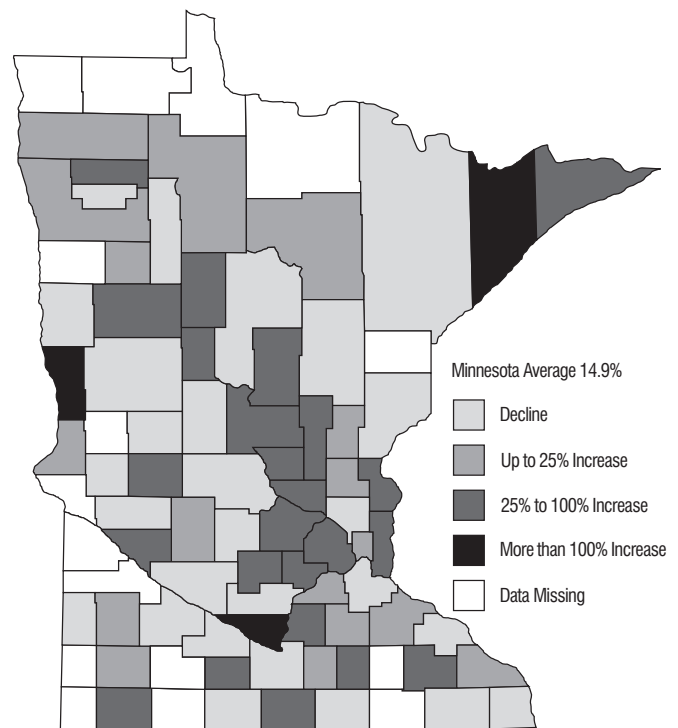
Manufacturing is concentrated in the Twin Cities metropolitan area but has had robust growth in recent years in rural parts of the state, especially west-central Minnesota. The value of manufactured shipments declined 2.9 percent statewide from 1987 to 1992, after adjusting for inflation, and the data indicates that the recession in the early 1990s hit manufacturing in the Twin Cities area much harder than in many rural counties. The value of shipments in four rural counties in west-central Minnesota — Grant, Traverse, Swift and Renville — more than doubled from 1987 to 1992. While the total value of shipments from these counties was small — tiny Traverse County shipped only \$3.9 million in 1992 — this growth is especially remarkable because it occurred in an area of the

Change in Value of Manufactured Shipments
1987 - 1992 (adjusted for inflation)



Source: Economic Census, 1987-1992

Change in Value of Manufactured Shipments
1982 - 1987 (adjusted for inflation)



Source: Economic Census, 1982-1987

state with an aging workforce. Shipments increased more than 50 percent in value during these five years in another eight counties; only Carver was in the Twin Cities metropolitan area. The value of shipments in Ramsey County declined 28.7 percent, Hennepin County 13.3 percent and Washington County 12.0 percent during this five-year period.

Growth in the value of manufacturing shipments between 1982 to 1987 was very different. Statewide, shipments increased in value 14.9 percent, after adjusting for inflation. In Hennepin, Ramsey and Washington counties, the value of manufacturing shipments increased 20 percent or more. Manufacturing shipments in Traverse, Swift, Renville, Stevens and Redwood counties declined (data for 1982 was suppressed for Grant County). By 1992, each of these counties had gained back the loss of 1982-1987 and more. In seven counties — Pine, Cass, Freeborn, Meeker, Red Lake and Todd — shipments decreased in value during both five-year periods. Ten-year declines ranged from 56 percent in Pine County to 13 percent in Todd County.

Of the \$57.3 billion worth of goods manufactured in 1992, 22.2 percent were produced in Hennepin County. The seven Twin Cities area counties produced 57 percent of all manufactured goods. Olmsted and St. Louis counties added another 6 percent, leaving the remaining 78 counties to produce 37 percent. While manufacturing growth has been strongest in rural areas, metropolitan counties continue to produce the majority of the state's manufactured goods.

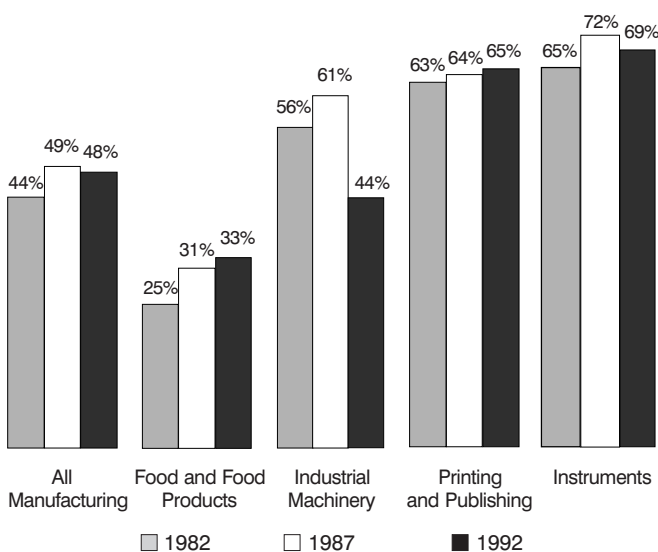
Manufacturing Process Adds Almost Half of Value of Shipments

In 1992, the manufacturing process added 48 percent of the value of products shipped. The value added in manufacturing is calculated by subtracting the costs of production — raw materials, supplies, fuel, labor and so on — from the value of shipments of processed goods. Instruments manufacture added 69.2 percent, leading all sectors. Petroleum processing added the least with only 31 percent. Food processing produces the highest value of shipments of any manufacturing sector, but the value added was only 33 percent of total shipments in 1992. Printing and publishing, third in total value of shipments, added 65.4 percent of the total value in the manufacturing process. The manufacture of industrial machines added only 44.2 percent.

Value added during the manufacturing process can vary markedly depending on the cost of inputs such as raw materials, supplies, fuel and labor. In 1982, for example, the value added during processing food products was only 25 percent of the value of food product shipments. For instruments manufacture, the proportion was 64.9 percent, and printing and publishing added 63.1 percent. The manufacture of industrial machinery added 55.8 percent in 1982.

Geographical differences in the proportion of value added during manufacturing are difficult to analyze because of the large number of variables. Since this proportion depends on the cost of inputs as well as type of manufacturing, value added as a percent of shipments tends to be lower in counties where the majority of manufacturing is food processing. But lower labor costs in these counties usually result in lower input costs when compared to the Twin Cities.

Value Added As a Percentage of Total Shipments



Source: Economic Census, 1982, 1987 and 1992

Employment Grows but Wages Lose to Inflation

Employment in manufacturing in Minnesota grew 11.3 percent between 1982 and 1992, a gain of 39,700 jobs. In Carver, Mille Lacs, Pope, Pennington and Nobles counties, manufacturing employment more than doubled between 1982 and 1992. Eleven counties for which data was reported lost employment during this time.

Manufacturing employment is highest in the metropolitan counties of Anoka, Dakota, Hennepin, Ramsey, Olmsted and Stearns. Each of these counties employs more than 10,000 people in manufacturing. Employment growth in

Stearns and Dakota counties exceeded 25 percent, or a net gain of 9,700 jobs, between 1982 and 1992. Both Hennepin and Ramsey counties had declines greater than 4 percent in total manufacturing employment, losing a total of 8,200 manufacturing jobs during this 10-year period.

Production workers in 1992 made up 57.4 percent of all employees in manufacturing. This proportion has been about the same for the last three Economic Censuses (1982, 1987 and 1992). The proportion was smaller in the metropolitan counties, with the lowest percentages of production workers found in Olmsted and Ramsey counties (36 and 37 percent, respectively). Major manufacturing firms located in these two counties also have administrative headquarters there. As a result, the number of administrative, clerical and managerial personnel is proportionally higher in these counties. In 27 small counties, production workers make up 80 percent or more of all employees.

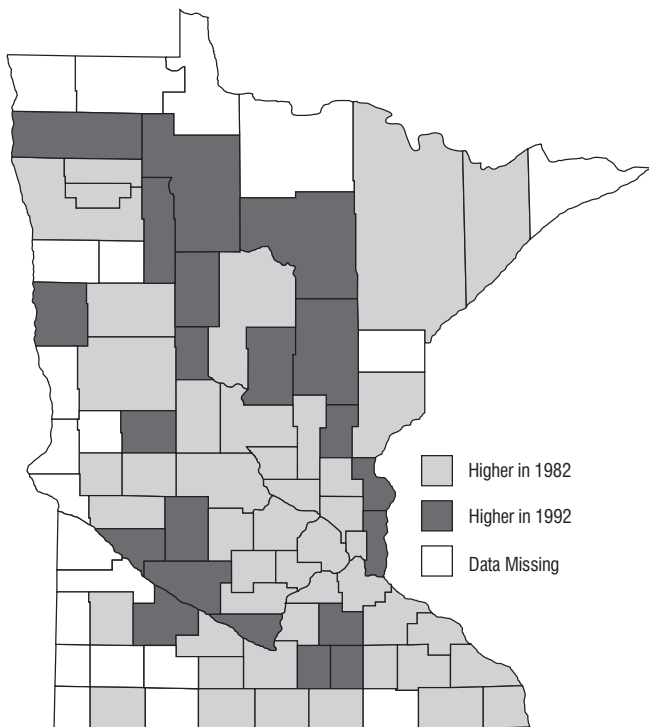
Production workers averaged hourly wages of \$11.97 in Minnesota in 1992. Wages in Itasca, Carlton and Washington counties were the highest in Minnesota in 1992, averaging more than \$15 per hour. Average hourly wages in Mahnomon and Murray counties were only \$5. In general, hourly wages were higher in metropolitan counties than in nonmetropolitan counties.

Production workers' wages in manufacturing lost ground from 1982 to 1992, with the biggest decline from 1987 to 1992. Wages declined \$1.28 cents per hour after adjusting for inflation, but fully \$1.05 between 1987 and 1992. Hourly wages averaged \$11.97 in 1992, but in 1982 (expressed in the equivalent of 1992 dollars) were \$13.25. In 1987, hourly wages averaged \$13.02 in 1992 dollars.

Because wages vary from sector to sector, the type of manufacturing in each county is important in determining average hourly wage. In 1992, the highest hourly wages statewide were paid to workers in petroleum processing — \$18.87. Apparel and textile workers received the lowest — \$7. In 1987, workers in paper production earned \$16.16 per hour, the highest for that year, but by 1992, their wages had dropped to \$14.91. Highest hourly wages in 1982 were paid to workers manufacturing transportation equipment — \$15.10. Workers in all sectors except furniture manufacture saw their wages decline relative to inflation over the 1982-1992 period. Many sectors had lost more than \$1 an hour.

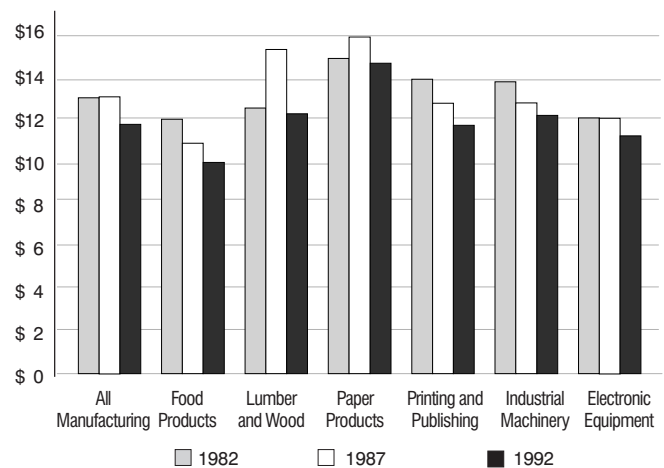
Some small rural counties had robust growth in wages from 1982 to 1992. Wages in Clearwater County more than doubled from \$4.85 (1992 dollars) in 1982 to \$11 in 1992. Eleven counties had real wage increases greater than 10 percent, but among metropolitan counties, only Washington and Chisago counties had gains that high. Changing industrial mix in local areas can have a great impact on wage levels. New industries can increase wages and enhance the standard of living markedly as manufacturing expands in rural areas. New high-paying jobs in industrial machinery manufacture boosted average production wages seemingly overnight in Clearwater County.

Change in Production Workers' Wages
1982 - 1992 (adjusted for inflation)



Source: Economic Census, 1982-1992

Hourly Wages for Production Workers
Adjusted for Inflation
1992 Dollars



Source: Economic Census, 1982, 1987 and 1992

Food Production Is Biggest Sector

Food production accounted for more than one-fifth of the value of all manufacturing shipments in 1992, making it the largest manufacturing sector. Food production is found throughout Minnesota but especially in rural western, central and southern counties near the source of the raw materials. Hennepin County had the highest value of food products shipped in 1992 with \$1.35 billion, Brown County was second with \$883 million, and Dakota County was third with \$829 million. Ramsey, Olmsted, Freeborn, Stearns, Otter Tail, Goodhue and Lyon counties completed the top 10 counties in value of food products shipped.

For eight counties, the total value of food products shipped was suppressed to avoid disclosing confidential information. However, shipments from some of these counties may be among the largest in the state. Data for Kandiyohi, Nobles, Polk and Mower counties is suppressed in the Economic Census. Disclosure codes show Polk with between 500 and 1,000 employees and each of the other three counties with between 1,000 and 2,500 employees in food production. Each of these counties has large food processing plants, but because large plants dominate total production, data has been suppressed.

Food production accounts for only about 11 percent of all manufacturing employment. In 1992, 41,800 people were employed in food production, and 32,200 were production workers. Average wages for production workers in food processing were \$10.14 per hour, or almost \$2 less than the average for all manufacturing in 1992. Hourly wages ranged from \$7.96 in Otter Tail County to \$13.94 in Rice County.

Some of the differences in average hourly wages may be due to location — metropolitan counties tend to have higher wages. Others may be due to differences in the type of food produced. The highest wages were paid to production workers in beverage manufacturing — \$14.48 an hour. Workers in grain milling operations earned \$13.30, but workers in fruit and vegetable processing earned only \$8.04 and those in meat processing \$8.72. Workers in dairy plants earned about the same as the average production worker in manufacturing — \$11.93. Looking at wages in finer detail shows that the 5,900 workers in poultry and egg processing earned only \$7.77 an hour. Only 500 people worked in frozen fish and seafood establishments, but their wages were the lowest in 1992 — \$5.64 an hour. Two hundred workers in malt plants earned an average of \$15 per hour, the highest in the industry.

Industrial Machinery Employs Most

While shipments of industrial machinery and equipment were a distant second in value, this sector employed the most people — 17,400 in 1992. Like food processing, industrial machinery manufacture historically has been a strong sector in Minnesota. However, its share has declined from 18.1 percent in 1982 to 13.8 percent in 1992. Part of that decrease was due to a huge drop in the production of computers and related equipment. Manufacture of this type of equipment made up 41.3 percent of all industrial machinery produced in Minnesota in 1992, but this sector was hit hard by the recession in the early 1990s. In addition, Minnesota's computer manufacturers have lost market share to strong competition from other states and countries. The Current Employment Survey found that employment in computer manufacturing (Standard Industrial Code 357) has declined in every year since 1984 except 1988. This sector lost 9,000 jobs between 1982 and 1992 and another 6,700 since 1992.

Hennepin County produces more than one-third of all industrial machinery and equipment manufactured in Minnesota. Ramsey County is second and Anoka is third. Manufacture of industrial machines is concentrated in the Twin Cities metropolitan area with more than half of the value of all shipments. Only 62.5 percent of the value of all shipments was allocated to counties, and data for this sector is suppressed for many important manufacturing counties, including St. Louis, Olmsted, McLeod and Brown.

Production workers making industrial machinery earned an average of \$12.40 an hour in 1992. Wages ranged from a low of \$8 in Blue Earth County to a high of \$14.67 in Scott County. Looking at wage rates by sector within industrial machinery, 3,200 production workers making computer storage devices averaged hourly earnings of only \$9.97, while 900 workers producing pumps and pumping equipment averaged \$20.56. Manufacture of computer equipment employed more people than any other sector in 1992, with 19,900 total employees and 6,000 production workers. But those workers earned hourly wages that were \$1 less than the state average for industrial machinery workers.

Printing and Publishing Has Most Establishments

Printing and publishing ranked third in percent of the total value of manufactured shipments in 1992. Unlike food

processing and manufacture of industrial machinery, printing and publishing has been expanding. In 1982, only 5.5 percent of the value of all manufactured goods shipped in Minnesota was produced in this sector; but in 1987, the proportion had risen to 7.2 percent and by 1992 was 8.3 percent of the total.

Printing and publishing is concentrated in the Twin Cities metropolitan area. Of the 14 counties with printing and publishing activity, only Brown, Nicollet, Todd and Winona are not metropolitan counties. More than a third of the value of printing and publishing shipments originated in Hennepin County; Ramsey and Dakota counties followed with 17 and 15 percent of the total, respectively.

Commercial printing employed more than half of all printing workers with 23,700 people, but average employment per establishment was only 28. Newspapers employed 8,500 employees with nearly 30 employees per establishment. Book publishers were much larger with a total of 6,500 employees and an average of 116 per establishment.

Wages in printing and publishing averaged \$11.92 in 1992, just 5 cents less than the manufacturing average. Wages in printing trade services were the highest in this sector, averaging \$14.94 per hour. Workers in book printing earned the lowest wages — only \$8 per hour. Printing and publishing production workers in Carver County earned the highest wage rates with \$15.55 per hour, while Winona County workers earned the lowest — \$8.25 per hour.

Manufacturing in Minnesota 1992 Economic Census

	Number of Establishments	Value of Shipments (Thousands)	Number of Employees	Number of Production Workers	Average Hourly Wages (Production)	Value Added by Manufacturing (Thousands)
Minnesota	7,931	\$57,302,300	391,300	224,800	\$11.97	\$27,324,700
Aitkin	34	26,600	300	200	9.00	10,300
Anoka	512	2,537,400	22,000	12,700	14.80	1,480,800
Becker	36	127,000	900	700	9.07	39,200
Beltrami	53	133,800	1,000	800	9.38	75,300
Benton	44	199,200	2,100	1,500	9.48	119,200
Big Stone	6	1,900	0	0	nd	1,000
Blue Earth	76	822,900	3,700	2,300	11.04	272,600
Brown	51	1,387,000	3,800	2,900	10.86	691,300
Carlton	39	357,600	2,300	1,900	16.88	217,100
Carver	133	1,491,200	9,900	5,900	11.15	779,400
Cass	46	17,800	200	200	7.67	7,600
Chippewa	27	59,500	600	400	9.78	27,100
Chisago	77	179,100	1,700	1,300	10.12	86,600
Clay	45	164,900	900	500	11.92	60,000
Clearwater	12	9,700	100	100	11.00	5,400
Cook	7	nd	nd	nd	nd	nd
Cottonwood	18	nd	nd	nd	nd	nd
Crow Wing	76	348,200	2,500	1,800	14.06	192,900
Dakota	411	4,769,000	21,800	12,000	11.81	2,019,700
Dodge	20	125,500	600	500	8.08	37,400
Douglas	55	304,600	1,800	1,200	11.38	127,600
Faribault	30	215,800	1,400	1,100	9.24	86,900
Fillmore	37	135,000	1,200	900	8.29	60,100
Freeborn	57	643,600	3,800	3,000	10.81	191,400
Goodhue	66	782,600	5,000	3,300	10.76	323,300
Grant	12	11,200	100	100	9.00	6,200
Hennepin	2,536	12,711,200	115,200	59,300	12.69	7,282,000
Houston	24	40,600	500	400	7.38	22,700
Hubbard	43	104,100	600	500	11.40	62,500
Isanti	55	165,300	1,200	900	9.72	56,700
Itasca	79	398,700	2,000	1,700	16.71	158,100
Jackson	11	45,400	600	400	7.13	24,500
Kanabec	11	53,600	500	400	10.71	24,200
Kandiyohi	62	331,500	2,500	2,000	8.76	120,200
Kittson	6	1,100	nd	nd	nd	600

Manufacturing in Minnesota

1992 Economic Census

	Number of Establishments	Value of Shipments (Thousands)	Number of Employees	Number of Production Workers	Average Hourly Wages (Production)	Value Added by Manufacturing (Thousands)
Koochiching	42	nd	nd	nd	nd	nd
Lac Qui Parle	8	\$233,600	300	300	\$9.50	\$36,700
Lake	21	85,500	500	400	11.11	44,800
Lake of the Woods	10	nd	nd	nd	nd	nd
Le Sueur	42	468,100	2,300	1,900	9.50	269,200
Lincoln	6	2,900	nd	nd	nd	1,700
Lyon	30	343,500	1,900	1,500	8.47	136,500
McLeod	58	1,295,200	7,400	5,000	10.91	657,800
Mahnomen	3	1,800	100	0	5.00	1,000
Marshall	12	12,600	100	100	7.50	5,900
Martin	40	273,400	2,300	1,600	8.47	125,800
Meeker	49	206,000	1,200	900	8.47	51,500
Mille Lacs	46	158,900	1,900	1,500	9.60	81,700
Morrison	42	186,100	1,600	1,300	8.77	72,400
Mower	39	nd	nd	nd	nd	nd
Murray	9	4,900	nd	nd	5.00	2,100
Nicollet	44	571,100	4,000	2,600	7.41	191,200
Nobles	25	660,600	2,600	2,100	9.37	156,200
Norman	4	700	nd	nd	nd	600
Olmsted	74	2,489,200	10,300	3,700	11.48	741,400
Otter Tail	76	427,000	2,800	2,100	8.49	150,600
Pennington	23	210,900	1,200	800	9.06	74,400
Pine	35	29,100	400	300	9.25	17,300
Pipestone	15	nd	nd	nd	nd	nd
Polk	40	259,400	1,100	900	10.52	86,000
Pope	29	36,900	500	400	8.25	21,200
Ramsey	814	8,050,100	64,500	23,900	13.95	4,164,100
Red Lake	8	7,500	100	100	10.00	3,100
Redwood	33	128,700	1,100	800	9.00	39,100
Renville	26	193,600	1,000	800	11.13	49,600
Rice	73	582,600	3,900	3,000	12.07	327,800
Rock	14	nd	nd	nd	nd	nd
Roseau	17	nd	nd	nd	nd	nd
St. Louis	244	888,900	6,100	4,100	11.07	499,800
Scott	106	767,200	4,500	3,000	12.65	382,800
Sherburne	68	146,500	1,600	1,100	10.91	98,000
Sibley	19	84,400	500	400	7.22	26,100
Stearns	185	1,560,000	11,300	8,800	10.30	647,400
Steele	61	698,800	5,500	3,300	11.01	354,800
Stevens	12	26,800	200	100	9.33	11,800
Swift	20	47,800	500	400	7.43	19,600
Todd	42	307,500	1,500	1,200	11.11	82,200
Traverse	7	3,900	0	0	nd	1,500
Wabasha	34	186,000	1,100	1,000	9.80	87,400
Wadena	33	53,000	600	400	10.25	29,900
Waseca	28	522,600	3,500	2,600	10.38	340,200
Washington	170	2,323,800	8,500	5,700	17.86	812,600
Watonwan	23	95,800	1,200	1,000	6.25	45,800
Wilkin	4	700	nd	nd	nd	300
Winona	113	847,500	7,200	4,900	9.31	412,500
Wright	129	312,900	2,500	1,800	9.54	155,600
Yellow Medicine	19	50,600	500	400	10.14	29,400

nd: data not available

Source: Economic Census, 1992

Data Sources

The U.S. Census Bureau conducts the Economic Census every five years in years ending in 2 and 7. The Economic Census includes data on wages, employment (both production workers and total employment), value of shipments, value added, number of establishments and hours worked, providing a very complete picture of manufacturing in 1992. Other data sources for manufacturing include the Bureau of Economic Analysis, County Business Patterns and the Department of Labor, but data from these sources is less comprehensive than the Economic Census. BEA data covers employment and personal income for broad sectors, such as manufacturing, mining and retail trade. CBP data includes total number of establishments, establishments by number of employees, average employment and payroll at finer levels of detail, for example, food processing, lumber and printing and publishing. Department of Labor data includes information on employment and payroll for manufacturing sectors (two-digit SIC codes) for

workers covered by unemployment insurance. Each of these data sources uses different methods and sources to derive data. The Economic Census provides complete coverage to the four-digit SIC level for the year the census is conducted. BEA, CBP and DOL data permit analysis of years between and following the Economic Census. BEA and CBP data are available through 1994, and DOL data is available through 1995. All of these data sources suppress data when necessary to prevent disclosing confidential information.

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