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Economic Impact of Foreign Exports on the Wisconsin Economy

By

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UNIVERSITY OF WISCONSIN-MADISON
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ECONOMIC IMPACT OF FOREIGN EXPORTS ON THE WISCONSIN ECONOMY^{*}

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Increasingly discussions of what can be done to improve Wisconsin's economy look to international markets as a potential source of growth for Wisconsin goods and services. For the most recent available data Wisconsin's exports amount to almost \$22 billion annually, with the majority of that originating in manufacturing, especially from the production of industrial machinery. This level of foreign exports generates about 115,000 jobs and about \$10.5 billion of total income for Wisconsin, with those figures capturing only the "direct" effects of exports and not the potential multiplier effects once the products are sold. In ten years' time from 1996-97 to 2007-08 foreign exports from Wisconsin nearly doubled.

In a recent study Jesse and Deller (2010)¹ examine the economic impact of foreign exports of agricultural farm products on Wisconsin and they find that once the multiplier effect is accounted for production

* Financial support for this work was provided by the Center for World Affairs and the Global Economy (WAGE), University of Wisconsin-Madison. This report has benefited from invaluable comments by Alison Alter. All errors are the responsibility of the author.

¹ Jesse, E. and S.C. Deller. (2010). "The Importance of International Trade to Wisconsin Agriculture." *Status of Wisconsin Agriculture*. University of Wisconsin-Madison/Extension.

agriculture generates a total of \$4.5 billion in total industrial sales, \$1.7 billion in total income and supports over 47,000 jobs. This represents roughly one-third of the total contribution of on-farm agriculture to the Wisconsin economy. While these levels alone are important, the recent growth in foreign exports from Wisconsin underscores the relevance of exports to the current and future state economy.

But how exactly has the expansion of foreign markets impacted Wisconsin? Which Wisconsin industries have the largest impact on Wisconsin because of foreign exports? Do these impacts vary spatially across Wisconsin? These are some of the basic questions that I address in this applied research study. Using the most current export data available and a family of regional input-output models of the Wisconsin economy and four sub-regions, I provide insights into not only the scale of foreign exports by industry but also estimates of the impacts of those exports on the Wisconsin economy.

The study proceeds in four sections. In the next section I very briefly describe the “globalization” of the world economy and what it does and does not mean. I then outline some broad trends in Wisconsin’s foreign exports. Who do we export to and how has that changed over time? Next I outline the concept of an economic multiplier and apply industry specific multipliers to a detailed range of Wisconsin industries. I close with a short discussion of the implications of this modest applied research project.

What is “Globalization”?

While the term “globalization” has been used by economists and other social scientists since the 1960s it came into the mainstream of discussion in the 1980s. Today globalization refers to a process by which all aspects of a regional society become integrated through world-wide networks of communication and trade. Examples are the worldwide popularity of American movies spreading “American culture” around the globe as well as the recent Football World Cup or Olympic Games. But the term is most widely used in references to economic integration across national boundaries. The adoption of the North American Free Trade Agreement, Europe’s Maastricht Treaty (the advent of the European Union), the Uruguay Round and the creation of the World Trade Organization to mediate international trade disputes, created a policy environment which encourages the exploration of international markets as a source of local growth.

Many argue that “economic globalization” is not a new phenomenon. Feenstra (1998)² notes that the decades leading up to 1913 were a “golden age” of worldwide trade, and World War I and the Great Depression in essence ended that golden period. It is only recently that world trade levels have returned to and moved ahead of where they were 100 years ago.

² Feenstra, R.C. (1998). “Integration of Trade and Disintegration of Production in the Global Economy.” *Journal of Economic Perspectives*. 12(4):31-50.

Over the past 50 years the level of exports for the U.S. has increased from 1.2 percent of gross domestic product (GDP) in the first quarter of 1960 to 2.9 percent in the last quarter of 2009 (Figure 1). A reasonable question is if U.S. exports account for only 2.9 percent of GDP how can one conclude we are in a “global economy”? It is helpful to first consider three things when responding. First, this 2.9 percent is only from a U.S. perspective and does not consider the dependency of other countries on foreign exports. For example, foreign exports account for 46.9 percent of the German GDP and for 34.7 percent of the Canadian GDP. Indeed, one could almost conclude that the U.S. is lagging behind the rest of the world in international trade. Second, the growth in exports is significant and an upward trend, other than the “bleep” of the most recent recession, is noticeable. Third, and perhaps most important, is the rapidly changing foreign trade policy environment. The U.S. and the European Union have embraced open markets and free-trade and many U.S. states, including Wisconsin, are aggressively pursuing export markets for economic growth and development. Wisconsin, for example, has a network of “Export Development Managers” and “International Office Network” within the Department of Commerce and the University of Wisconsin-Madison has the Center for World Affairs and the Global Economy (WAGE) and the Center for International Business Education and Research (CIBER) to support this strategy.

In the beginning of 1960 U.S. exports were about \$6.2 billion and right before the most recent recession, specifically the third quarter of 2008, exports peaked at \$478.1 billion, an increase of 7,576 percent (Figure 2). The most recent available data from the last quarter of 2009 reveal that U.S. exports are recovering from the recession and are about \$418.7 billion.

Significantly, exports are just one part of our participation in the global economy. Over the same 50 year time the level of imports increased from 1.1 to 3.7 percent of gross domestic product. This means that in dollar terms imports increased from \$5.7 billion in the first quarter of 1960 to \$527.6 billion in the last quarter of 2009. Since 1960, the percentage of gross domestic product that is exported grew at an annual rate of about 0.5 percent while imports grew by 0.7 percent per year. While these may appear to be modest growth rates one must keep in mind the cumulative affect over time. The difference between exports and imports is reflected in the U.S. trade deficit which stood at \$108.9 billion in the last quarter of 2009. It is important to understand these figures are given in nominal dollars, specifically the affects of inflation are not removed from the data. Nonetheless, the increase in the level of international trade for the U.S. economy is significant.

While true that U.S. exports today account for less than three percent of the whole of the U.S. economy and directly (i.e., before the multiplier effect is considered) about four percentage of the Wisconsin economy as measured by industrial sales, the changes in trade policies coupled with the growth rate in international trade combine to minimize the likelihood of economic globalization reversing anytime soon. These growth rates in international trade, which appear to have accelerated since the mid-1970s, strongly suggest that there are implications for the Wisconsin economy. But exactly how important are foreign exports to the Wisconsin economy?

Overall Wisconsin Trends

Of the 50 states Wisconsin ranks 18th in terms of total foreign exports with almost \$22 billion worth of exports, or about 1.7 percent of the U.S.'s total foreign exports (Table 1). Given Wisconsin's share of national population, about 1.8 percent, this level of exports is about what one might expect. Texas and California lead the U.S. in terms of foreign exports. Given the size of California and Texas' common border with Mexico, this result is not unexpected. Compared to our neighboring states, Wisconsin ranks below Illinois, Michigan and Minnesota but ahead of Iowa.

Canada, Wisconsin's closest neighbor, is the largest single export market accounting for 31.1 percent of all foreign exports from Wisconsin (Table 2).³ After Canada Wisconsin's largest export markets are Mexico and China with over \$1 billion in exports followed by Germany, Japan, the United Kingdom, Australia and Saudi Arabia with over one-half billion dollars in exports each. Significantly, Wisconsin exports to 230 countries including the Vatican City in Rome, Tajikistan and even Fiji. Wisconsin exports more than \$1 million in goods and services to each of 130 countries, underscoring the impressive presence of Wisconsin companies in a wide range of foreign markets.

Perhaps what is the more important observation from the data is the strong growth in foreign exports from 1996-97 to 2007-08 (Figure 3). Over that relatively short time period exports double from \$9.8 billion to \$19.9 billion with noteworthy increases in exports to China (954.8%), United Arab Emirates (466.1%), India (358.5%) and Mexico (348.0%). Exports to our primary export market, Canada, increased by 85.4 percent from \$3.3 billion in 1996-97 to just over \$6 billion. Although the most current Wisconsin data does not reflect the recent recessionary downturn in exports (Figures 1 and 2) we could expect that as the economy recovers export levels should recover and continue to grow. The increasing trend in Wisconsin's foreign exports points to how globalization is affecting the Wisconsin economy. Not only is globalization expanding potential markets but it is also exposing Wisconsin to shifts in international markets as evident by the most current recession.

When we consider which Wisconsin industries are involved in foreign exports, three account for 56.2 percent of all exports over the 2007-08 time-period. Industrial machinery, such as paper making equipment, exported an average of \$6.5 billion per year over 2007-08 accounting for 32.8 percent of total Wisconsin exports. Electrical machinery accounted for 13 percent of all exports while scientific and medical instruments exported an average of \$2.1 billion over the same period. The next largest category is vehicles which for Wisconsin includes trucks (predominately Oshkosh Trucks) and automobiles (primarily GM) accounting for \$1.9 billion or 9.4 percent of all Wisconsin foreign exports. Unfortunately, with the closure of the GM facility in Janesville and the Chrysler Engine Plant in Kenosha, this category of exports is likely to decline.

³ Note that the data reported in Table 1 are for 2008, the most current year of available data, but the data in Table 2 and 3 are annual averages over 1996-1997 and 2007-2008. By using a two year average we minimize any distortions caused by unusual one year spikes or dips in the data.

The Wisconsin industries that experienced the most growth in foreign exports include beverages which went from \$15.7 to \$126.2 million (704.8% increase), agricultural products going from \$34 million to \$204.3 (500.3% increase) which is dominated by the rapid expansion of dairy exports and baking related goods which went from an annual average of about \$32 million in 1996-97 period to almost \$160.8 million (402.7% increase). But care must be taken when looking at individual annual data. Dairy, for example, experienced rapid growth in foreign exports in 2008 due to favorable exchange rates coupled with very high milk prices (Figure 4) (Dobson 2010; Jesse and Deller 2010).⁴ In 2009 milk prices collapsed as well as demand from international markets. While dairy prices are notorious for strong swings, the instability in agricultural export markets points to certain risks that are incurred by entering foreign markets. Harley-Davidson, for example, has identified volatility in foreign exchange rates as one of their highest areas of risk.

Foreign Export Impacts

There are several ways in which one can assess the economic impact of foreign exports on the Wisconsin economy. The simplest approach is to conduct what is called a “head count” which considers only the direct effect and is reported in the previous section of this study. Here one simply measures the absolute size of an industry, or in our case here, volume of exports, without considering how those exports ripple through the rest of the economy. That rippling affect is often referred to as the multiplier effect. The second approach is to use the complete model of the regional (or state) economy to capture not only the multiplier effect itself, but also to decompose the multiplier effect across the different sectors of the economy. This was the approach used by Jesse and Deller (2010) to assess the impact of agricultural foreign exports on Wisconsin as well as Deller and Williams (2009)⁵ to assess the contribution of agriculture as a whole to the Wisconsin economy.

The third approach, the one adopted for this study, uses what is referred to as a “scalar multiplier analysis”. Here I use the summary multiplier for each industry for which there are foreign exports and we apply that industry multiplier to that industry. This provides us with a summary of the total impact of that particular industry’s foreign exports on the whole of the economy. For this study I conduct scalar multiplier analysis on five levels, one for the state as a whole and for the four sub-regions of the state as outlined in Map 1. By conducting sub-state level analysis we gain a better understanding of how all parts of Wisconsin, not just the urban southeast area around Milwaukee, are impacted by foreign export markets.

We face one problem in conducting this analysis, specifically the industrial classifications with which the U.S. Department of Commerce reports data (i.e., Table 3) do not match the classification system used in our models of Wisconsin and the four sub-regions. For this impact assessment I use the IMPLAN

⁴ Dobson, B. (2010). “The General Economy and Agricultural Trade.” *Status of Wisconsin Agriculture*. University of Wisconsin-Madison/Extension.

⁵ Deller, S.C. and D. Williams. (2009). “The Contribution of Agriculture to the Wisconsin Economy.” Department of Agricultural and Applied Economics Staff Paper No. 541. University of Wisconsin-Madison/Extension. (August).

modeling system to construct our Wisconsin economic models and use the IMPLAN estimates of foreign exports. While the U.S. Department of Commerce data provides the starting point for IMPLAN, these data must be adjusted to be consistent with the IMPLAN industrial classification scheme which is much more detailed than what is provided by the U.S. Department of Commerce. In addition, the export data is only available at the state level and sub-state levels must be estimated using industrial employment levels. The assumption that must be made to implement the sub-state analysis is that foreign exports are distributed across the state in proportion to employment. For example, if there is almost \$600 million worth of plastics products (Table 3) being exported then those exports are distributed across the state by employment shares in the plastic industry. This is clearly a strong assumption and care must be taken in interpreting the sub-state analysis.

Before moving to the analysis itself, consider the logic of what an economic multiplier is and is not. The multiplier allows us to measure how a change in economic activity in one sector, such as expanding foreign exports, ripples throughout the whole of the economy. Graphically, we can illustrate the rippling or multiplier effect by thinking in terms of re-spending and leakages of money out of the economy (Figure 5). The direct effect of change is shown in the far left-hand side of the figure. For simplification, if this direct effect is a \$1.00 change in the level of foreign exports, the indirect effects will spillover or ripple into other sectors and create an additional 66 cents of activity.

Suppose that there is a one dollar increase in foreign exports for dairy products. That increase in exports represents additional revenue or sales to the dairy sector. In order for dairy to produce that additional dollar of output, they must increase production. This requires that the dairy sector must purchase additional inputs. Suppose for the purpose of this illustration that dairy farmers buy a dollar worth of feed for the livestock. In this example, 40¢ is spent on Wisconsin grown feed and 60¢ goes to grain farmers in Illinois. This 60¢ represents a leakage of money from the state's economy. The 40¢ that goes to Wisconsin grain farmers represents an increase in demand for their product and they in turn need to increase production to meet that new level of demand. Suppose that the Wisconsin grain farmers use that 40¢ to hire additional labor. That 40¢ represents wages or income flowing to farm workers. Suppose that the farm workers take that 40¢ and spend it going to the movies. That 40¢ represents sales to local movie theaters. Those theaters take part of that 40¢ to help pay for the movie itself, and, in this example 24¢ of the 40¢ goes to Hollywood and represents a leakage out of the regional economy. The remaining 16¢ is used to pay for the utility bill for the electricity required to run the theater. This 16¢ is revenue to the local utility which spends 6¢ on labor and 10¢ on Montana coal which is again a leakage to the regional economy. This cycle continues until the amount being re-spent in the regional economy goes to zero. Adding up all the regional re-spending provides a measure of the multiplier or ripple effect of that initial increase in foreign exports for dairy products. In this example the \$1 increase in foreign exports results in a total impact on the regional economy of \$1.66 (1.00+40¢+16¢+6¢+3¢+1¢).

The weakness of using this scalar multiplier approach is that we cannot decompose the multiplier and identify which specific industries are impacted or to what extent. Another limitation is that we cannot

provide a single estimate of the total impact of all foreign exports on the Wisconsin economy. Specifically, there is no such thing as an “aggregate” multiplier for the whole state as multipliers are unique to each specific industry. Also, one **cannot** simply add the individual industry impacts to arrive at a state total. To do so would result in serious double counting errors and overstate the actual impact of foreign exports on Wisconsin. For example, the impact of dairy foreign exports impacts the crops industry via the multiplier effect while at the same time, foreign exports of crops spills over onto the dairy industry because cows eat some of the crops. To add the dairy and crop impacts together would be double counting the interplay of the two separate industries thus overstating the true impact. *Thus care must be taken **not** to add the individual industry impacts together.*

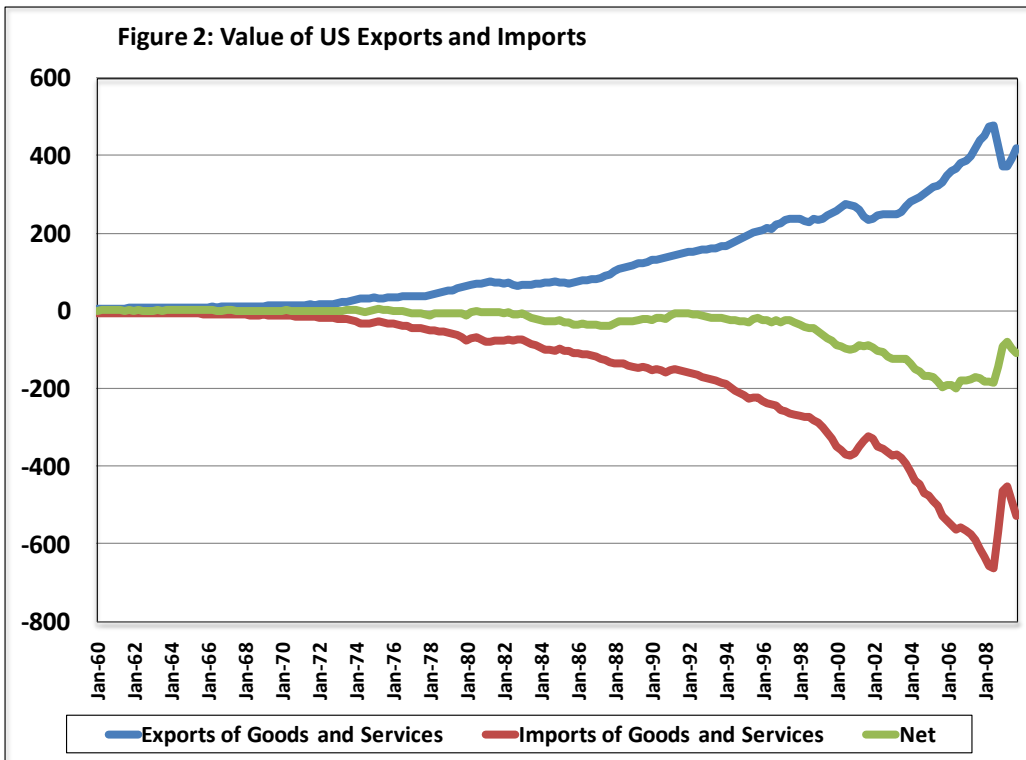
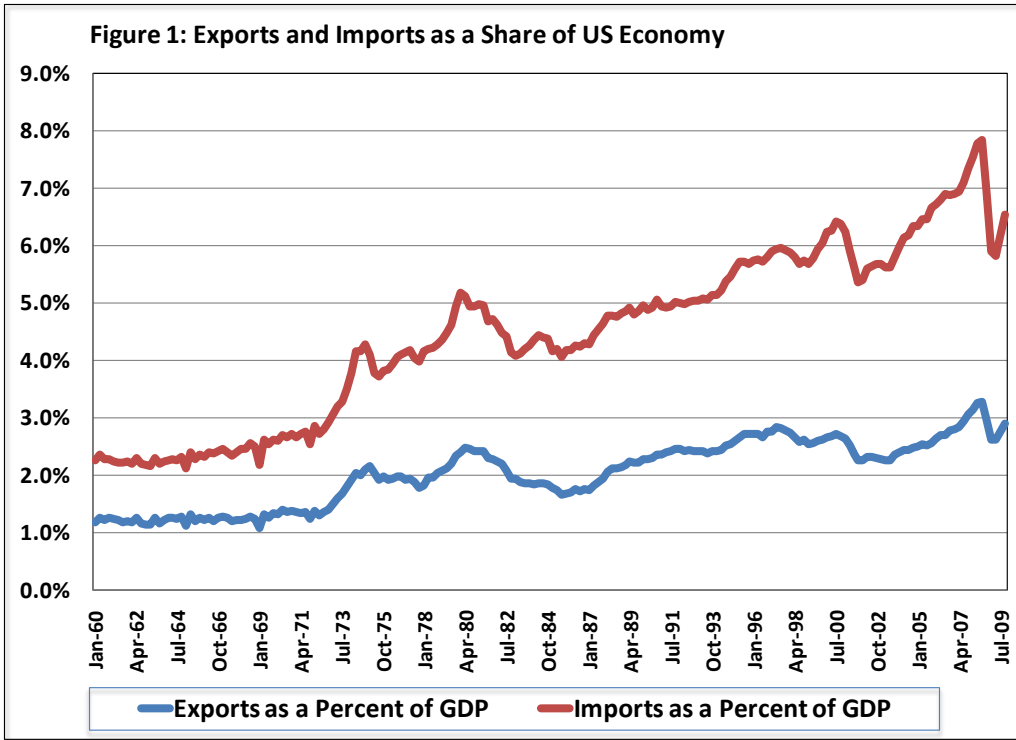
The results of the Wisconsin state level analysis is provided in Table 4. There are three measures of economic impact: industry sales, employment and total income. Industry sales is the same metric as reported in Tables 1, 2 and 3, employment is a mix of full- and part-time workers and total income includes wages, salary, proprietor income plus selected transfers and is akin to gross domestic product. Foreign exports of machinery manufacturing, which include farm machinery as well as tool and die manufacturing to name a few, have the largest impact on the Wisconsin economy contributing \$12.5 billion to industrial sales, over 57,000 jobs and more than \$4.7 billion of total income once the multiplier effect has been taken into account. The second largest impact in terms of industrial sales is computer and other electronic manufactured goods where foreign exports contribute \$5.5 billion to industrial sales, 24,600 jobs, and \$1.8 billion to total income. Foreign exports of chemical manufacturing contribute slightly less to total industrial sales at slightly more than \$5 billion, but 15,500 jobs and almost \$1.9 billion to total income. The relatively smaller jobs impact speaks to higher labor productivity and higher wages, salaries and proprietor income levels per job. As an alternative, consider the impact of foreign exports of Wisconsin crop commodities which contribute \$1.4 billion to industry sales, 16,700 jobs but only \$665 million to total income. Compared to chemical manufacturing crop farming labor productivity is not as high and hence wages, salaries and proprietor income is not as high.

The results for the analysis for northwestern Wisconsin is provided in Table 5, southwestern Wisconsin is in Table 6, southeastern Wisconsin in Table 7 and finally northeastern Wisconsin is in Table 8. I leave it up to the reader to review the results of the analysis for the sub-regional analysis but I will note that there are important regional variations in the roles different industries play in understanding the impact of foreign exports. For example, in northwestern Wisconsin (Table 5) food products (food processing) and crop farming play an important role in understanding the impacts of foreign exports. Whereas in southwestern Wisconsin transportation equipment plays an important role. Yet, not surprisingly, in northeast Wisconsin the foreign exports of paper manufacturing are a major contributor to regional economic activity. It is also of interest to note that the largest impacts of foreign exports does appear in the more urban eastern parts of Wisconsin and the smaller impacts are in the more rural western parts. This should not be surprising because of the relative concentration of economic activity in the more eastern, particularly southeastern, parts of Wisconsin.

Summary

The widespread use of the phrase “globalization” has spurred significant interest by Wisconsin and other state economic development policy-makers and practitioners in promoting foreign export markets. This study has attempted to document the contribution of foreign exports to the Wisconsin economy. I have done this by looking at overall trends in Wisconsin’s foreign exports along with a detailed assessment of the economic impacts of foreign exports on the Wisconsin economy. I have found that for the U.S. foreign exports account for a small but growing proportion of the overall economy. For Wisconsin, total foreign exports are about \$22 billion. When we consider that the total industrial sales for all of Wisconsin are about \$482 billion, foreign exports account for about four percent of the Wisconsin economy which is slightly higher than for the U.S. total economy even before considering the multiplier effect. In terms of employment, about 115,000 jobs are required to produce all the Wisconsin goods and services that are exported or about 3.2 percent of all Wisconsin employment. In terms of total income, about \$10.5 billion was generated through foreign exports, again before the multiplier effect is considered.

I found that the foreign export of machinery manufacturing has the largest impact on Wisconsin once the multiplier effect has been considered. Other large contributors are computer and other electronic manufacturing, chemical manufacturing, and transportation equipment manufacturing. The data also reveal that a range of service providers also contribute to foreign exports such as professional, scientific and technical services where foreign exports contribute 2,600 jobs to the Wisconsin economy along with \$165 million in total income. The analysis also demonstrates that there is significant heterogeneity across the regions of Wisconsin that we examined. For example, for northwestern Wisconsin food processing is a major foreign exporter but in northeast Wisconsin paper is a source of exports. This study has documented the contribution of foreign exports to the Wisconsin economy. While it remains a relatively small share of the total Wisconsin economy the potential for growth is significant.



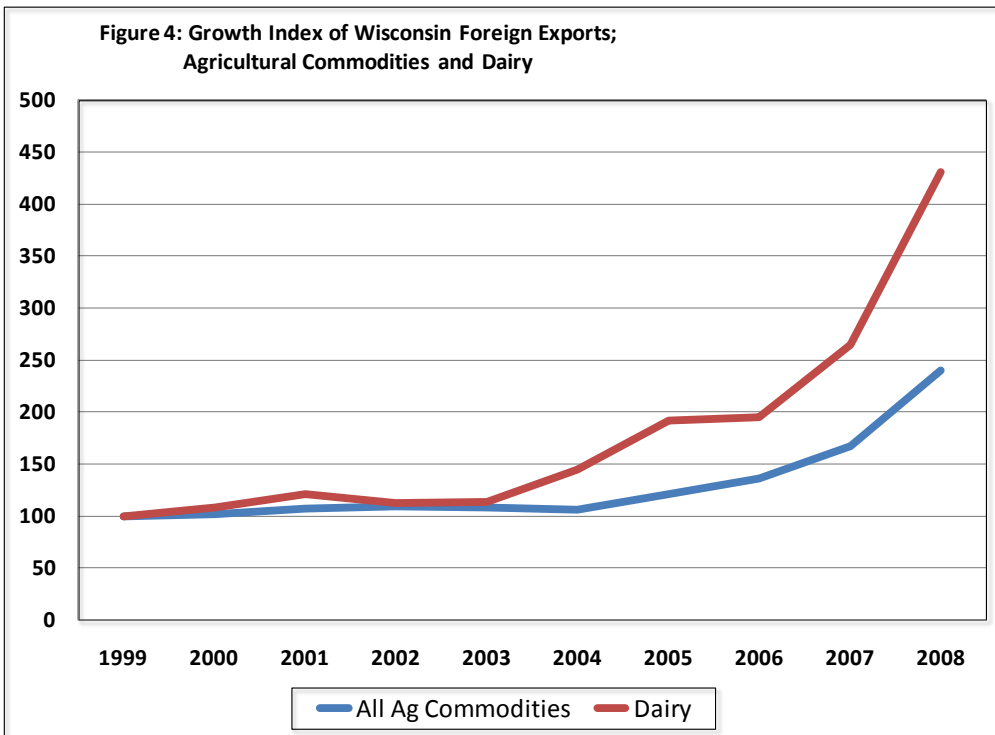
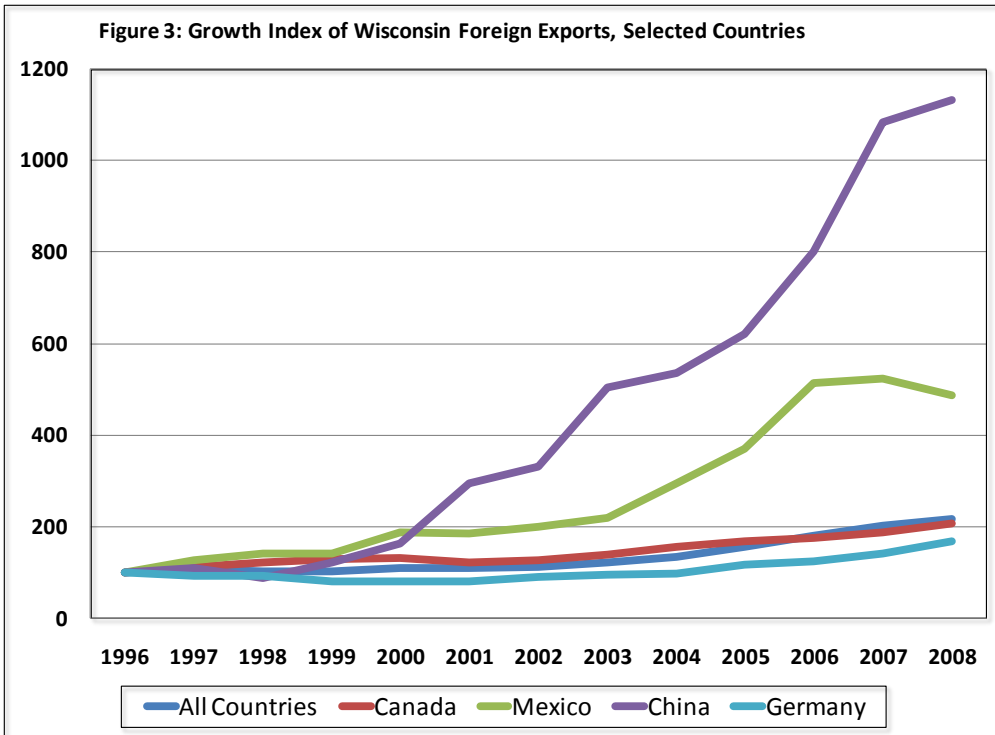


Figure 5: The Logic of a Multiplier

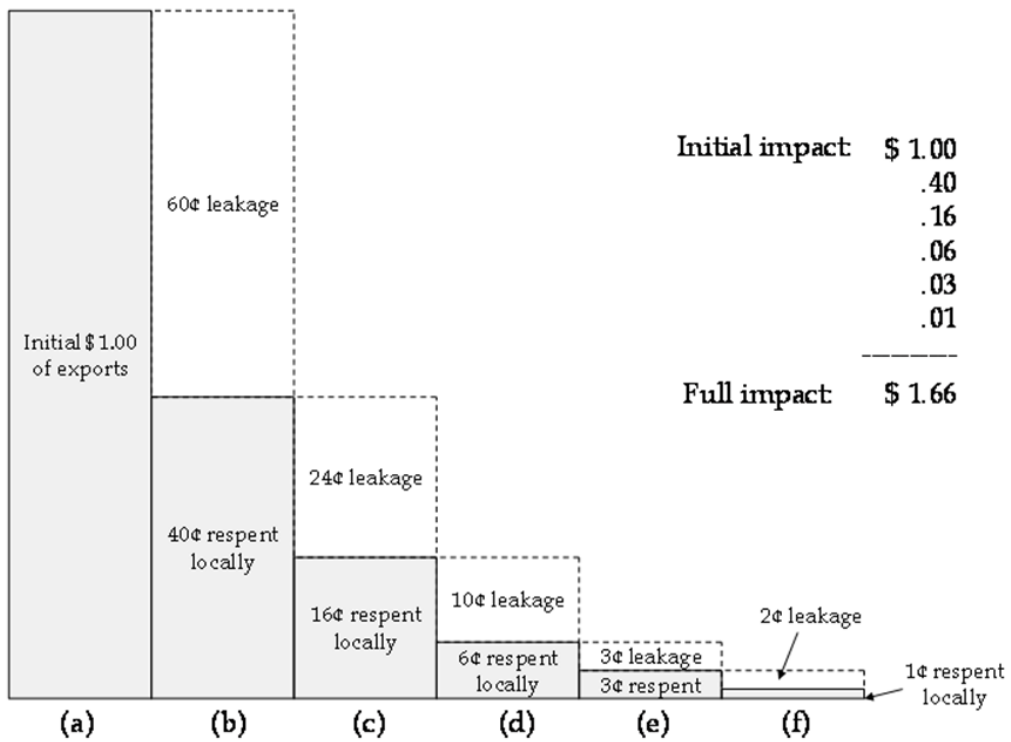


Table 1: Foreign Exports Top 20 States (2008)

	Foreign Exports (millions)	Share of US	Population	Share of US
Texas	153,002	11.8%	24,304,290	8.0%
California	152,295	11.7%	36,580,371	12.0%
New York	85,393	6.6%	19,467,789	6.4%
Illinois	72,668	5.6%	12,842,954	4.2%
Michigan	64,430	5.0%	10,002,486	3.3%
Washington	56,878	4.4%	6,566,073	2.2%
Florida	51,723	4.0%	18,423,878	6.1%
Ohio	48,342	3.7%	11,528,072	3.8%
New Jersey	42,637	3.3%	8,663,398	2.8%
Pennsylvania	40,334	3.1%	12,566,368	4.1%
Minnesota	31,053	2.4%	5,230,567	1.7%
Massachusetts	29,856	2.3%	6,543,595	2.1%
Georgia	25,357	1.9%	9,697,838	3.2%
Indiana	24,227	1.9%	6,388,309	2.1%
North Carolina	24,080	1.9%	9,247,134	3.0%
Tennessee	23,229	1.8%	6,240,456	2.1%
Louisiana	22,409	1.7%	4,451,513	1.5%
Wisconsin	21,986	1.7%	5,627,610	1.8%
Connecticut	21,170	1.6%	3,502,932	1.2%
Oregon	19,754	1.5%	3,782,991	1.2%

Source: US Department of Commerce

Table 2: Top 20 Countries Wisconsin Exports To

	1996-1997 Average	2007-2008 Average	Share of Total 2007-2008 Average	Percent Change
All Countries	9,814,181,451	19,869,221,251		102.5%
Canada	3,329,301,709	6,171,761,380	31.1%	85.4%
Mexico	407,640,020	1,826,289,594	9.2%	348.0%
China	114,229,297	1,204,866,964	6.1%	954.8%
Germany	451,933,683	725,592,448	3.7%	60.6%
Japan	696,003,213	689,774,224	3.5%	-0.9%
United Kingdom	575,678,678	702,957,564	3.5%	22.1%
Australia	252,386,529	573,570,542	2.9%	127.3%
Saudi Arabia	225,606,518	515,925,670	2.6%	128.7%
France	361,041,610	479,896,045	2.4%	32.9%
Brazil	163,506,198	373,295,315	1.9%	128.3%
Belgium	187,964,587	418,506,822	2.1%	122.7%
Netherlands	252,355,548	377,018,216	1.9%	49.4%
Korean Republic	197,738,961	344,322,240	1.7%	74.1%
Chile	107,826,954	247,957,513	1.2%	130.0%
Italy	158,990,091	318,297,684	1.6%	100.2%
Hong Kong	194,319,485	295,606,058	1.5%	52.1%
United Arab Emirates	41,314,119	233,873,937	1.2%	466.1%
Taiwan	144,660,050	234,384,075	1.2%	62.0%
Thailand	66,075,261	217,844,174	1.1%	229.7%
India	50,017,432	229,337,539	1.2%	358.5%

Source: US Department of Commerce

Table 3: Top 20 Commodities Wisconsin Exports To Foreign Countries

	1996-1997 Average	2007-2008 Average	2007-2008 Average	Percent Change
All Commodities	9,814,181,451	19,869,221,251		102.5%
Industrial Machinery	3,092,532,149	6,508,498,271	32.8%	110.5%
Electrical Machinery	791,890,754	2,585,810,050	13.0%	226.5%
Scientific and Medical Instruments	1,058,331,284	2,080,444,624	10.5%	96.6%
Vehicles, Not Railway	1,321,622,351	1,864,573,847	9.4%	41.1%
Paper, Paperboard	433,684,378	812,543,840	4.1%	87.4%
Plastic	268,779,489	641,519,319	3.2%	138.7%
Iron/Steel Products	149,857,604	333,029,545	1.7%	122.2%
Book+Newspaper; Manuscript	121,171,546	266,020,454	1.3%	119.5%
Furniture And Bedding	74,320,397	243,227,430	1.2%	227.3%
Cereals	276,933,558	366,448,280	1.8%	32.3%
Aircraft, Spacecraft	120,738,854	177,201,439	0.9%	46.8%
Dairy, Eggs, Honey, Etc	34,029,109	204,279,158	1.0%	500.3%
Misc. Chemical Products	91,843,827	186,250,528	0.9%	102.8%
Ores, Slag, Ash	104,496,849	119,812,628	0.6%	14.7%
Baking Related	31,985,587	160,804,199	0.8%	402.7%
Wood	80,119,760	166,371,290	0.8%	107.7%
Miscellaneous Food	43,183,346	139,936,431	0.7%	224.1%
Iron And Steel	31,025,414	109,373,193	0.6%	252.5%
Beverages	15,681,837	126,207,375	0.6%	704.8%
Pharmaceutical Products	26,714,278	103,929,712	0.5%	289.0%

Source: US Department of Commerce

Table 4: Economic Impact of Industry Specific Foreign Exports on Wisconsin (2007)

	Percent Industry Sales Going to Foreign Export	Impact Foreign Exports on Industry Sales	Impact Foreign Exports on Jobs	Impact Foreign Exports on Total Income
Machinery Mfg	30.2%	12,521,069,589	57,089	4,767,897,426
Chemical Manufacturing	16.7%	5,039,217,691	15,541	1,886,000,784
Computer & oth electron	31.9%	5,539,150,428	24,611	1,800,601,089
Wholesale Trade	8.2%	2,878,014,939	21,448	1,760,084,604
Transportation eqpmt	19.3%	4,812,747,181	18,868	1,529,501,218
Electircal eqpt & appliances	28.2%	3,651,079,385	16,919	1,424,901,026
Paper Manufacturing	11.6%	3,468,458,913	14,111	1,163,793,281
Food products	7.8%	3,731,288,028	19,447	1,151,081,388
Fabricated metal prod	9.4%	2,692,857,058	14,723	1,139,769,522
Plastics & rubber prod	11.7%	1,851,417,971	8,721	707,436,353
Crop Farming	29.1%	1,429,820,153	16,768	665,327,354
Miscellaneous mfg	18.8%	991,653,911	6,451	454,445,409
Truck transportation	5.8%	864,163,461	7,131	447,619,886
Management of companies	4.4%	728,576,415	4,875	406,391,425
Furniture & related prod	13.5%	660,410,359	4,781	278,075,811
Insurance carriers & related	1.5%	551,387,321	3,282	240,967,875
Nonmetal mineral prod	9.7%	470,750,915	2,561	203,412,439
Publishing industries	5.3%	381,761,320	2,710	185,954,018
Professional- scientific & tech svcs	0.9%	281,505,673	2,608	165,271,921
Primary metal mfg	4.9%	417,852,818	2,210	165,141,252
Securities & other financial	2.9%	304,396,966	2,118	135,531,357
Couriers & messengers	11.8%	166,029,245	2,125	113,562,903
Air transportation	13.2%	266,850,899	1,647	109,016,300
Wood Products	3.2%	269,627,161	1,778	106,376,354
Printing & Related	3.0%	193,015,972	1,714	105,620,999
Textile Mills	14.6%	297,028,170	1,369	93,677,093
Leather & Allied	47.8%	244,694,195	1,559	83,648,633
Sightseeing transportation	12.4%	118,028,950	1,352	75,988,103
Rail Transportation	6.9%	132,199,667	657	63,859,719
Telecommunications	1.0%	88,449,272	426	46,760,337
Mining	6.6%	64,780,337	385	37,723,965
Forestry & Logging	5.3%	60,705,627	471	34,461,330
Livestock	0.4%	48,516,228	422	19,503,028
Water transportation	33.9%	50,771,289	283	17,788,323
Beverage & Tobacco	1.2%	47,305,548	168	15,075,797
Warehousing & storage	1.2%	22,144,715	253	13,921,392
Admin support svcs	0.2%	23,271,066	352	13,090,422
Petroleum & coal prod	5.4%	74,539,976	98	12,937,114
Educational svcs	0.4%	23,750,766	312	12,629,215
Textile Products	8.9%	34,005,194	248	12,090,648
Motion picture & sound recording	1.6%	24,384,296	189	8,564,691
Internet & data process svcs	0.5%	14,299,168	96	6,889,131
Other information services	1.8%	1,577,443	16	998,020
Ag & Forestry Svcs	0.1%	574,597	15	403,258

Source: IMPLAN 2007 and author calculations.

Map 1: Regional Definitions

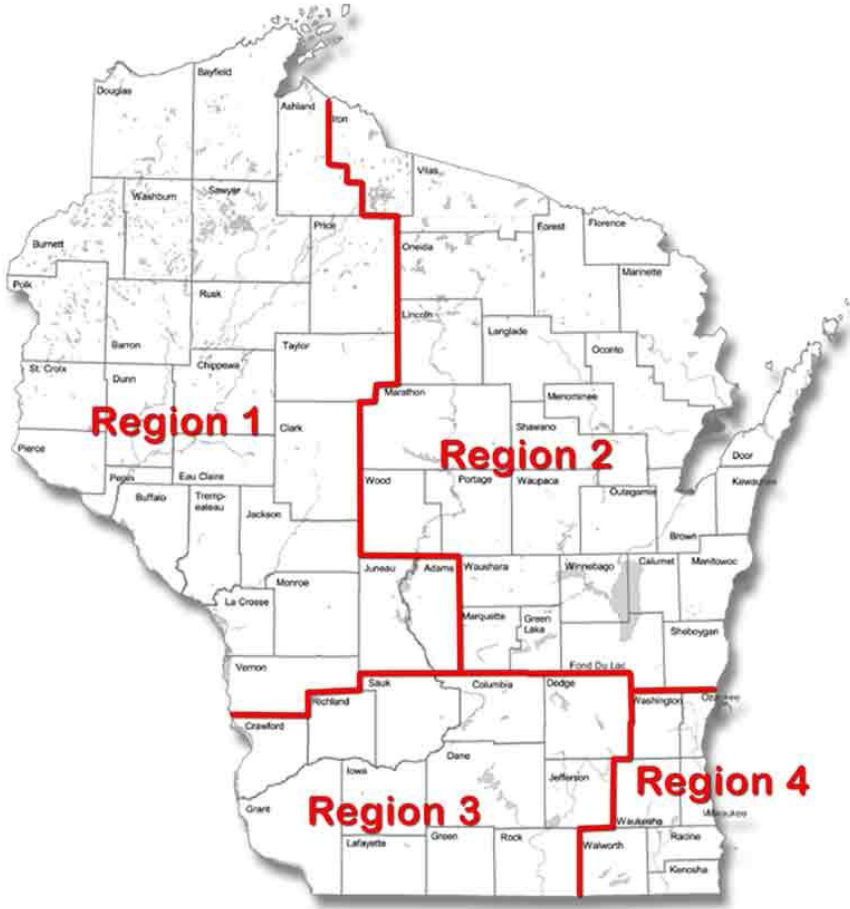


Table 5: Economic Impact of Industry Specific Foreign Exports on Northwest Wisconsin (2007)

	Percent Industry Sales Going to Foreign Export	Impact Foreign Exports on Industry Sales	Impact Foreign Exports on Jobs	Impact Foreign Exports on Total Income
Machinery Mfg	29.1%	1,562,802,755	7,007	552,627,617
Food products	7.3%	774,372,112	3,932	200,310,455
Crop Farming	29.1%	377,217,538	5,029	168,932,283
Computer & oth electron	18.1%	360,611,368	1,676	98,368,401
Fabricated metal prod	8.7%	252,564,607	1,411	94,046,425
Plastics & rubber prod	11.8%	258,023,127	1,366	89,567,260
Wholesale Trade	8.2%	244,033,773	2,078	145,087,416
Electirical eqpt & appliances	26.1%	199,348,878	944	66,001,639
Paper Manufacturing	10.6%	185,650,676	816	55,666,797
Truck transportation	5.8%	194,231,552	1,633	95,285,295
Miscellaneous mfg	22.8%	140,205,887	930	56,685,583
Chemical Manufacturing	19.6%	132,245,170	446	37,298,141
Nonmetal mineral prod	13.2%	140,854,818	786	56,837,943
Furniture & related prod	9.0%	129,353,123	974	49,982,571
Transportation eqpmt	13.1%	99,681,128	505	30,321,439
Lessor of nonfinance intang assets	41.5%	90,434,318	299	56,383,826
Wood Products	3.6%	103,611,820	688	39,937,425
Petroleum & coal prod	5.5%	49,795,346	45	5,006,584
Management of companies	4.4%	62,147,446	453	31,754,879
Rail Transportation	6.9%	48,316,401	235	22,349,944
Forestry & Logging	5.4%	33,512,642	267	18,771,584
Primary metal mfg	5.5%	23,818,227	125	7,770,024
Insurance carriers & related	1.2%	25,990,506	181	9,943,732
Publishing industries	4.4%	22,462,430	185	10,322,218
Water transportation	33.9%	20,925,867	118	6,986,880
Sightseeing transportation	12.4%	16,787,470	183	10,864,835
Textile Mills	8.9%	15,000,889	86	4,188,474
Professional- scientific & tech svcs	0.8%	16,726,680	177	9,313,836
Couriers & messengers	11.8%	15,559,547	236	10,431,219
Livestock	0.4%	16,476,828	146	6,096,565
Printing & Related	3.1%	13,195,631	135	6,547,672
Air transportation	13.2%	12,409,244	77	4,213,988
Mining	10.9%	9,848,925	62	5,418,268
Textile Products	9.5%	9,154,357	69	2,808,927
Securities & other financial	2.9%	9,251,920	68	3,686,334
Telecommunications	1.0%	6,885,925	33	3,529,712
Warehousing & storage	1.2%	5,963,510	72	3,714,780
Beverage & Tobacco	1.1%	5,331,413	19	1,653,491
Utilities	0.3%	3,104,382	11	1,905,254
Admin support svcs	0.3%	3,541,624	56	1,856,589
Leather & Allied	15.0%	3,112,576	22	1,118,768

Source: IMPLAN 2007 and author calculations.

Table 6: Economic Impact of Industry Specific Foreign Exports on Southwest Wisconsin (2007)

	Percent Industry Sales Going to Foreign Export	Impact Foreign Exports on Industry Sales	Impact Foreign Exports on Jobs	Impact Foreign Exports on Total Income
Transportation eqpmt	20.8%	10,888,915,978	7,029	579,284,959
Machinery Mfg	27.1%	5,109,215,510	6,622	518,999,065
Chemical Manufacturing	21.9%	6,933,186,441	4,946	503,893,658
Computer & oth electron	43.9%	2,913,093,180	5,644	419,557,311
Electrical eqpt & appliances	23.4%	3,112,192,310	3,205	268,989,201
Food products	5.3%	14,127,287,249	3,465	210,841,213
Wholesale Trade	8.2%	6,780,544,091	4,299	339,458,142
Crop Farming	35.1%	1,363,157,147	5,840	211,824,410
Fabricated metal prod	7.6%	4,579,293,843	1,842	145,231,245
Plastics & rubber prod	11.9%	3,084,697,643	1,770	136,187,896
Nonmetal mineral prod	17.3%	1,168,437,100	1,116	86,231,584
Miscellaneous mfg	21.5%	885,057,156	1,186	87,641,939
Publishing industries	6.6%	2,392,087,588	1,011	80,788,491
Insurance carriers & related	1.6%	8,948,434,073	836	63,754,187
Truck transportation	5.8%	2,129,158,501	1,049	63,189,751
Management of companies	4.4%	2,106,356,446	624	51,066,831
Furniture & related prod	6.4%	1,127,985,871	488	30,384,739
Paper Manufacturing	9.4%	571,087,185	245	18,666,014
Professional- scientific & tech svcs	0.8%	7,136,590,647	516	32,026,868
Textile Mills	18.2%	300,371,883	259	17,021,985
Primary metal mfg	4.0%	1,051,935,634	229	17,079,196
Printing & Related	3.0%	1,227,019,298	333	20,378,429
Securities & other financial	2.9%	1,439,975,415	297	17,398,003
Couriers & messengers	11.8%	241,252,960	394	19,785,667
Telecommunications	1.0%	2,549,348,779	117	13,159,835
Wood Products	3.9%	588,458,078	156	8,690,313
Mining	6.3%	255,218,552	91	9,453,865
Air transportation	13.2%	125,449,635	108	6,256,622
Rail Transportation	6.9%	228,732,378	78	7,663,521
Livestock	0.5%	2,838,408,731	134	6,212,233
Sightseeing transportation	12.4%	98,405,618	147	7,853,258
Beverage & Tobacco	1.1%	782,157,663	30	2,732,789
Leather & Allied	36.4%	19,961,911	49	2,404,279
Utilities	0.3%	1,242,448,874	13	2,660,551
Forestry & Logging	4.6%	79,855,842	23	2,140,223
Warehousing & storage	1.2%	410,025,143	55	2,996,017
Motion picture & sound recording	1.5%	328,513,476	41	1,712,123
Textile Products	8.6%	33,232,369	21	962,799
Internet & data process svcs	0.5%	524,620,509	19	1,044,945
Admin support svcs	0.1%	2,401,158,957	31	1,126,213
Petroleum & coal prod	2.2%	60,640,480	5	663,862
Educational svcs	0.2%	733,391,491	27	902,732
Water transportation	33.9%	3,926,037	7	429,196
Oil & gas extraction	2.1%	53,597,687	5	644,170
Other information services	1.8%	62,597,312	11	706,551
Hospitals	0.0%	3,042,925,967	6	344,546
Performing arts & spectator sports	0.3%	231,188,552	16	290,317
Pipeline transportation	1.6%	28,108,457	2	178,716
Construction	0.0%	10,661,363,541	4	217,252
Waste mgmt & remediation svcs	0.1%	403,911,101	2	106,799
Ag & Forestry Svcs	0.1%	159,373,997	5	153,856

Source: IMPLAN 2007 and author calculations.

Table 7: Economic Impact of Industry Specific Foreign Exports on Southeast Wisconsin (2007)

	Percent Industry Sales Going to Foreign Export	Impact Foreign Exports on Industry Sales	Impact Foreign Exports on Jobs	Impact Foreign Exports on Total Income
Machinery Mfg	31.9%	5,084,951,739	22,695	2,062,107,413
Computer & oth electron	35.1%	3,677,618,524	15,537	1,227,699,696
Electircal eqpt & appliances	30.2%	2,329,303,587	10,593	950,511,543
Chemical Manufacturing	13.4%	2,137,308,563	6,029	887,691,906
Wholesale Trade	8.2%	1,339,731,042	9,189	834,835,611
Transportation eqpmt	20.3%	1,151,785,913	4,978	484,833,579
Fabricated metal prod	9.0%	920,094,077	5,108	391,694,813
Food products	7.2%	732,295,298	3,003	201,698,378
Plastics & rubber prod	10.9%	495,561,962	2,268	201,322,563
Management of companies	4.4%	384,079,344	2,463	219,668,356
Miscellaneous mfg	16.5%	362,849,937	2,325	173,871,713
Lessor of nonfinance intang assets	41.5%	181,665,289	593	114,728,481
Paper Manufacturing	7.7%	192,406,146	850	64,847,003
Air transportation	13.2%	191,759,179	1,161	82,049,919
Truck transportation	5.8%	192,377,819	1,537	102,544,278
Securities & other financial	2.9%	191,900,593	1,270	89,376,781
Insurance carriers & related	1.5%	184,309,996	1,042	85,363,898
Leather & Allied	54.5%	180,350,507	1,087	61,348,093
Professional- scientific & tech svcs	1.0%	162,016,139	1,437	97,482,495
Primary metal mfg	4.4%	139,224,411	724	56,092,668
Furniture & related prod	17.8%	118,647,170	850	51,465,890
Crop Farming	27.6%	97,890,577	1,192	48,735,673
Publishing industries	4.0%	96,721,039	684	45,961,073
Couriers & messengers	11.8%	84,866,788	976	58,897,670
Printing & Related	3.0%	82,765,670	708	46,520,581
Textile Mills	13.8%	81,689,844	336	25,372,901
Nonmetal mineral prod	5.7%	73,403,422	383	32,666,441
Sightseeing transportation	12.4%	58,055,781	672	37,680,935
Telecommunications	1.0%	34,836,310	162	18,605,135
Beverage & Tobacco	1.1%	20,509,467	63	6,807,229
Mining	6.8%	17,506,429	96	10,358,805
Rail Transportation	6.9%	18,154,481	88	8,933,607
Educational svcs	0.4%	16,544,173	199	9,193,356
Motion picture & sound recording	1.8%	17,397,842	124	6,378,511
Admin support svcs	0.2%	12,983,249	197	7,507,375
Water transportation	33.9%	12,188,700	65	4,439,702
Wood Products	2.1%	10,287,325	74	4,134,536
Textile Products	12.6%	9,846,398	71	3,652,322
Internet & data process svcs	0.5%	10,241,274	64	5,237,627
Utilities	0.3%	6,025,724	18	3,584,821
Warehousing & storage	1.2%	6,168,150	72	3,891,731
Livestock	0.7%	2,731,864	26	1,123,683
Performing arts & spectator sports	0.2%	2,812,922	48	1,526,123
Oil & gas extraction	2.1%	1,591,026	6	926,720
Hospitals	0.0%	1,744,045	15	925,838
Forestry & Logging	4.8%	711,651	4	410,963
Pipeline transportation	1.6%	796,522	3	244,064
Construction	0.0%	697,875	5	336,930
Fishing- Hunting & Trapping	5.5%	493,773	7	301,709
Other information services	1.8%	422,504	4	269,974
Waste mgmt & remediation svcs	0.1%	363,608	2	182,879
Ag & Forestry Svcs	0.1%	79,056	2	57,062

Source: IMPLAN 2007 and author calculations.

Table 8: Economic Impact of Industry Specific Foreign Exports on Northeast Wisconsin (2007)

	Percent Industry Sales Going to Foreign Export	Impact Foreign Exports on Industry Sales	Impact Foreign Exports on Jobs	Impact Foreign Exports on Total Income
Machinery Mfg	29.9%	3,802,815,684	16,450	1,310,296,724
Paper Manufacturing	12.1%	2,668,548,408	10,222	849,065,098
Fabricated metal prod	10.9%	1,041,120,998	5,451	445,678,423
Transportation eqpmt	17.8%	1,113,906,761	4,780	333,389,289
Chemical Manufacturing	19.8%	984,914,739	2,836	302,474,637
Food products	4.8%	1,202,003,791	5,541	316,158,416
Wholesale Trade	8.2%	632,722,362	4,932	384,206,886
Plastics & rubber prod	12.2%	533,868,099	2,487	192,829,711
Crop Farming	24.8%	389,540,922	4,488	187,184,506
Electrical eqpt & appliances	29.4%	313,015,887	1,490	111,646,534
Truck transportation	5.8%	308,928,623	2,550	158,314,401
Furniture & related prod	21.9%	298,688,441	2,315	126,277,640
Miscellaneous mfg	18.2%	205,823,057	1,390	90,216,061
Primary metal mfg	5.6%	182,632,469	929	68,594,323
Lessor of nonfinance intang assets	41.5%	154,122,332	444	96,569,252
Management of companies	4.4%	159,255,474	1,056	88,067,782
Insurance carriers & related	1.5%	174,954,005	1,052	71,636,909
Computer & oth electron	8.0%	125,983,184	550	34,614,162
Textile Mills	14.6%	107,588,966	509	31,571,160
Wood Products	2.8%	117,753,236	778	45,323,972
Publishing industries	5.6%	88,766,651	658	41,346,597
Printing & Related	3.0%	52,067,358	480	28,334,792
Nonmetal mineral prod	4.1%	48,258,767	262	20,584,206
Securities & other financial	2.9%	51,233,435	372	20,319,894
Air transportation	13.2%	41,264,991	256	15,622,548
Rail Transportation	6.9%	40,966,555	198	19,384,127
Leather & Allied	37.5%	43,550,233	286	13,937,198
Professional- scientific & tech svcs	0.7%	39,367,524	380	22,881,716
Rental & leasing svcs	5.7%	40,661,889	330	17,835,751
Couriers & messengers	11.8%	31,778,569	468	21,858,032
Petroleum & coal prod	6.4%	20,235,854	24	3,763,456
Sightseeing transportation	12.4%	25,918,125	302	16,737,847
Forestry & Logging	5.4%	20,992,266	173	11,912,429
Telecommunications	1.0%	19,458,456	93	10,117,160
Mining	5.9%	18,195,743	116	10,550,872
Utilities	0.3%	11,153,715	34	7,396,646
Water transportation	33.9%	13,862,097	73	4,314,310
Livestock	0.3%	11,057,950	97	4,372,700
Beverage & Tobacco	1.7%	10,234,047	38	2,467,499
Textile Products	6.0%	8,692,387	62	3,002,617
Warehousing & storage	1.2%	4,275,337	47	2,732,451
Admin support svcs	0.1%	3,897,038	61	2,154,112
Educational svcs	0.4%	3,262,152	49	1,610,604
Pipeline transportation	1.6%	2,764,001	11	800,887
Fishing- Hunting & Trapping	3.7%	1,759,616	33	1,070,569
Oil & gas extraction	2.1%	1,215,936	5	700,766
Performing arts & spectator sports	0.2%	1,161,896	16	694,065
Motion picture & sound recording	1.0%	1,094,451	9	355,378
Hospitals	0.0%	1,110,676	10	572,830
Internet & data process svcs	0.5%	1,075,920	8	447,890
Construction	0.0%	604,193	5	269,971
Waste mgmt & remediation svcs	0.1%	251,656	2	118,448
Ag & Forestry Svcs	0.1%	171,493	5	122,867

Source: IMPLAN 2007 and author calculations.