Export Trends in Washington State

Volume 2

WASHINGTON STATE UNIVERSITY EXTENSION FACT SHEET • FS023E

Abstract

Accurate descriptions of export trends are needed for industry representatives, analysts, policymakers, and business owners to properly assess market conditions. Washington-specific export information is particularly important because statistics indicate the state is the national leader in terms of the percent of its shipments that are exports. This fact sheet provides data on manufactured exports from Washington State to foreign countries for several large industries (including aerospace and fruit and vegetable preserves) in a context emphasizing the relationships between exports and the overall economy.

This is the second edition of an annual series. New material includes revised and updated data on exports and shipments, as well as information on the percent of exports transported over water and the number of export destinations.

Introduction

FS023E is the second in a series of Extension publications providing Washington export data and facts. Subsequent fact sheets in the series will update and highlight changes in the information here. The Extension piece "The Collection and Description of Washington State Export Data" (Cassey 2010) includes explanation of 1) how the Washington State export data used in this series are collected, 2) interpretation limitations, and 3) definitions of many technical terms.

This fact sheet contains figures that depict trends in Washington exports by industry from 2002 to 2008. (Comparable 2009 data are not available as of this printing.) The data are represented as an inflation-adjusted time series, which allows export trends to be observed. The figures also emphasize the relationships among Washington's exports, industries, total shipments (both foreign and domestic sales), and overall economic activity. The industries studied include some of the largest in the state, such as aerospace and computer equipment, along with a special focus on processed agricultural product industries, such as fruit and vegetable preserves and meat products.

New material for this second edition of Export Trends in Washington State includes 2008 industry export data and 2007–2008 data on industry shipments. I introduce a new figure showing the percent of processed agricultural exports transported by water and two new figures showing the number of foreign destinations that Washington exports to by industry and year.

The data here emphasize exports in the context of both time and overall economic activity. For example, a policymaker can use this fact sheet to determine how the relationship between aerospace industry exports and total exports from Washington State has changed since 2002 or compare dairy product exports and shipments over time.

On June 10, 2009, the U.S. Census Bureau announced a new method of compiling state export data for the aerospace industry. This new method reclassified intermediate inputs into the production of aerospace goods as part of the aerospace sector and removed them from their original classifications. The Census Bureau also discovered repeated, systematic overages in the export values from the civilian engines and parts sector. Fixing these errors resulted in a large decrease in aerospace and total export statistics for some states, including Washington. For this publication, these two changes apply to state export data covering 2004–2008 but not for 2002–2003 because no revision for these years is available. For more details, visit http://www.census.gov/foreign-trade/statistics/notices/aircraft/.

Washington State's Department of Commerce provides general international trade statistics with its *Commerce*

Quarterly Trade Bulletin. Current and past issues are available at http://www.choosewashington.com/Pages/CommerceQuarterlyTradeBulletin.aspx. The *Bulletin* highlights a particular foreign country in each issue, often focuses on a single industry, provides an overview of current events, describes the destination countries for Washington exports, and offers news on policy issues. The export trend data in this fact sheet complement the *Commerce Quarterly Trade Bulletin* to provide a more robust picture of Washington's exports.

The source of Washington's export data is the World Institute for Strategic Economic Research (http://www.wisertrade.org). Cassey (2010) provides a full description of these data and how they are collected. The key feature of the state export data is their focus on the export's origin of movement as it begins traveling abroad rather than its origin of production, which has important implications for how the data may be interpreted without spurious conclusions. Refer to Cassey (2010) for details.

Though the origin-of-movement state export data are only available for purchase, some Washington State export data may be obtained for free from TradeStats Express™ (http://tse.export.gov/). I adjusted all nominal export data here to account for inflation using the annual values from the Consumer Price Index for all urban consumers, all items less food and energy for the Seattle-Tacoma-Bremerton area, available from the Bureau of Labor Statistics (http://www.bls.gov/cpi, Series ID: CUUSA423SA0L1E). The base year is the 1982–1984 average. This means that the dollar value of the data in this fact sheet corresponds to the value of the dollar from 1982 to 1984. Data on shipments are from the Geographic Area Statistics of the Annual Survey of Manufactures (http://www.census.gov/manufacturing/asm/) and the Economic Census (http://www.census.gov/econ/census07/) conducted by the U.S. Census Bureau.

Many of the figures below may be found, with the associated data in tabular form, at Washington State University's School of Economic Sciences' website (http://www.ses.wsu.edu/Extension/Cassey-exports/indexAC.htm#RealExports).

Inflation-adjusted Manufacturing Exports

I adjusted the value of exports reported by the Census Bureau in each year (nominal exports) to account for differences in the price level of goods from year to year. Reporting inflation-adjusted data allows the reader to make comparisons over time without the confounding effects of price level changes.

Washington Export Patterns in Total and by Selected Industry

After a few down years following the 2001–2002 recession, total inflation-adjusted (real) manufacturing exports in Washington increased steadily from 2004 until 2007 but plummeted in 2008. Total Washington exports nearly doubled, from $12 billion in 2004 to $20 billion in 2007, but in 2008, total Washington exports decreased $2.5 billion or 10.2%. (Recall these values are reported in 1982–1984 dollar terms, as are the revised data, which results in differences from export quantities listed in the first edition of

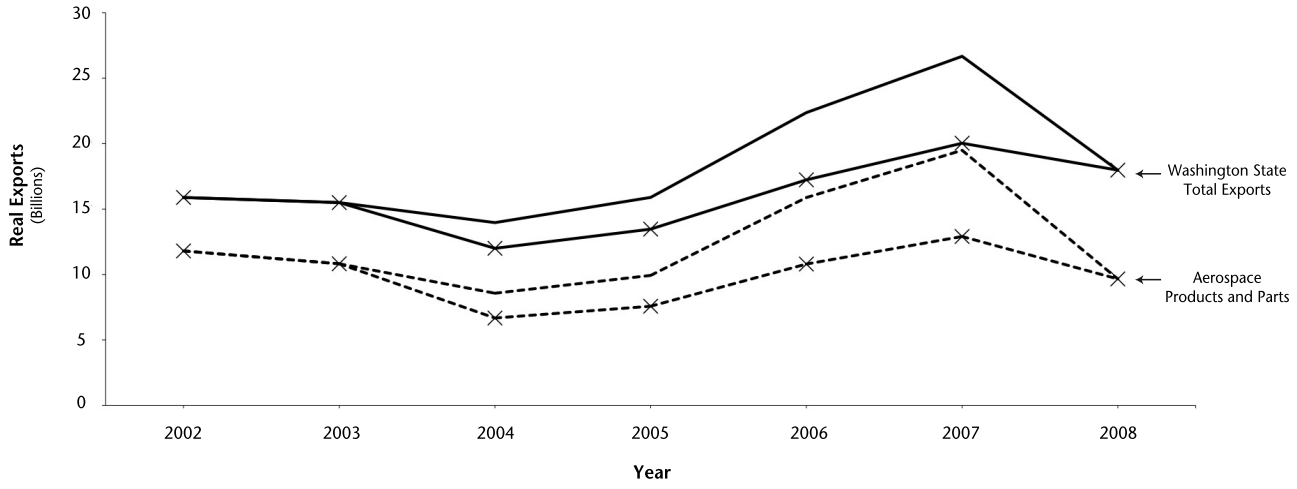

Figure 1. Inflation-adjusted exports for Washington State aerospace products and parts and total exports to the world by year. Revised data are marked with an x.

Export Trends in Washington State (FS007E).) As Figure 1 shows, the state trend in total exports is nearly identical to the trend in the aerospace products and parts industry (NAICS 3364). After falling following 2002, aerospace product exports nearly doubled, from $6.7 billion in 2004 to $12.9 billion in 2007. But aerospace exports plummeted by $3.2 billion or more than 25% in 2008. This dramatic decrease in aerospace exports is likely due to the International Association of Machinists strike at Boeing from September 7 to November 1.

Figure 1 shows inflation-adjusted exports for both the aerospace industry and Washington State. The revised data are marked with an *x*. The revision decreased the figures for Washington exports in the aerospace products and parts industry substantially: $2 billion less in 2004 and $6.5 billion less in 2007, two-thirds of the original data. The revised data indicate Washington exported substantially less than originally thought (and described in the first edition of Export Trends in Washington State (FS007E)).

Figure 2 shows the trend in inflation-adjusted (real) exports for four other large exporting industries in Washington State (left axis): "computer equipment" (NAICS 3341); "petroleum and coal products" (NAICS 3241); "navigational, measuring, electromedical, and control instruments" (NAICS 3345); and "other general-purpose machinery" (NAICS 3339; includes goods such as pumps, compressors, and material handling equipment). Total Washington State exports are repeated from Figure 1 (scale is on the right axis of Figure 2) so that the trend in exports for these four industries can be compared to the state's export trend. Note the difference in scale on the left and right vertical axes.[1] That the difference in scale is a factor of 20 shows these other large export industries are dwarfed by the exports from aerospace. As Figure 2 shows, three of Washington's top exporting industries contracted in 2008 after a trend of growth the previous five years, although the decreases were mild compared to the aerospace industry decline shown in Figure 1. The petroleum and coal products industry, however, more than doubled exports from 2007 to 2008.

Comparing the aerospace industry to the state total in Figure 1 and other industries in Figure 2 shows how dominant aerospace products are within Washington's total exports. Aerospace accounts for between 50 and 75% of Washington's total exports from 2002 through 2008. The dominance of aerospace exports in the composition of total Washington exports explains how the data revisions to aerospace exports had such a large impact on the state total. Though the share of aerospace has decreased since 2002, the aerospace industry continues to figure prominently in state exports. No other industry in Washington accounts for more than 7% of total state exports in any year, including 2008. Graphs showing what percent each industry comprises of Washington's total exports from 2002 through 2008 are available at http://www.ses.wsu.edu/extension/Cassey-exports/real-exp/graph2A2B.pdf.

[1]The export data provided in Figures 1 and 2 may be displayed as the percent change in exports from year to year. This figure is available at http://www.ses.wsu.edu/extension/Cassey-exports/real-exp/graph3.pdf.

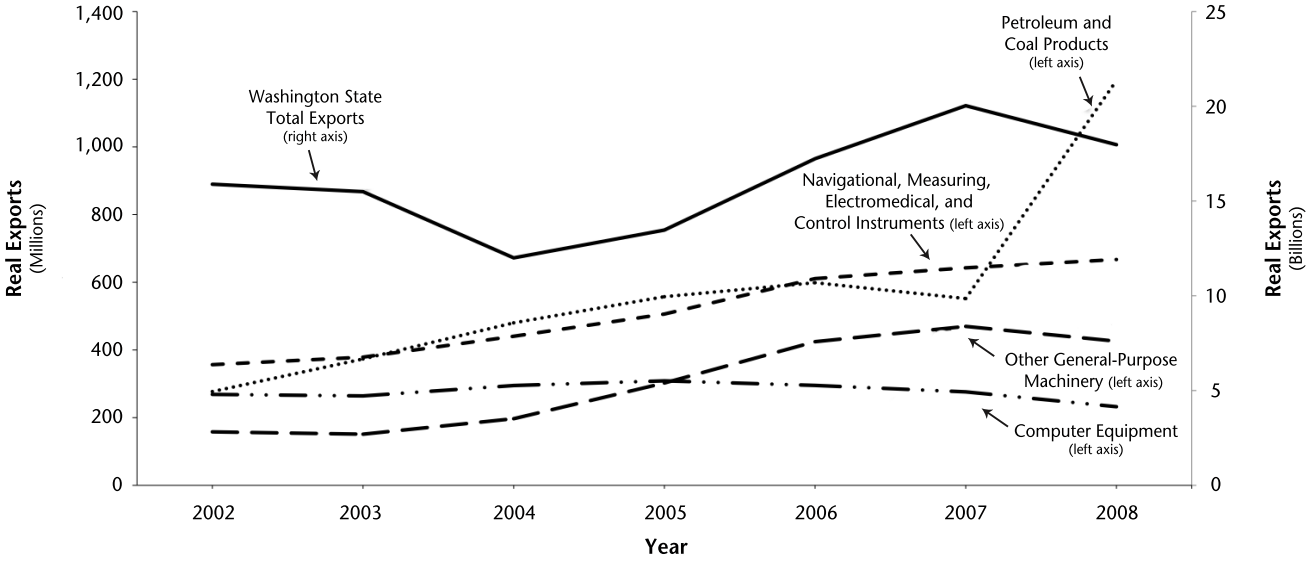

Figure 2. Inflation-adjusted exports for four Washington State industries and total exports to the world by year.

Washington Exports as a Percent of Washington Shipments by Industry

Washington State leads the nation in the fraction of total shipments that are exported. (Note that shipments are defined as the value of products sent to Washington, the rest of the United States, and foreign destinations; exports refer only to the value of those sent to foreign destinations.) Total state shipments are from a Census Bureau statistic describing data on the value of primary and secondary goods, measured at the producing establishment, that are sold, transferred to another establishment of the same company, or shipped on consignment to any destination within Washington, the United States, or the world.

Figure 3 shows this information by industry. Due to restrictions in order to protect the identity of individual firms, the Census Bureau does not report shipment data for the aerospace industry. Thus, aerospace is not included in Figure 3.

Bernard and Jensen (1995) document the fraction of exported shipments as 5–15% for industries across the United States. In comparison, Figure 3 shows that large exporting industries in Washington export 20% or more of their shipments. Computer equipment leads, with exports accounting for up to 60% of shipments in 2005, though the navigational, measuring, electromedical, and control instruments industry surpassed computer equipment in 2008.

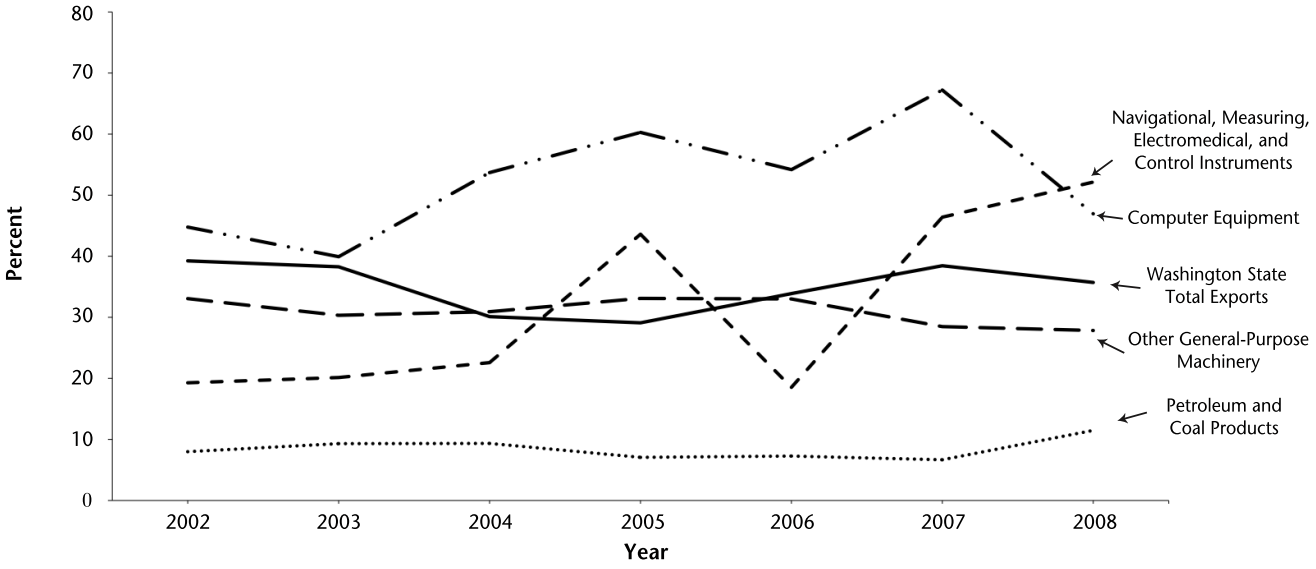

Figure 3. Percent of total shipments exported to the world for Washington State and four of its industries by year.

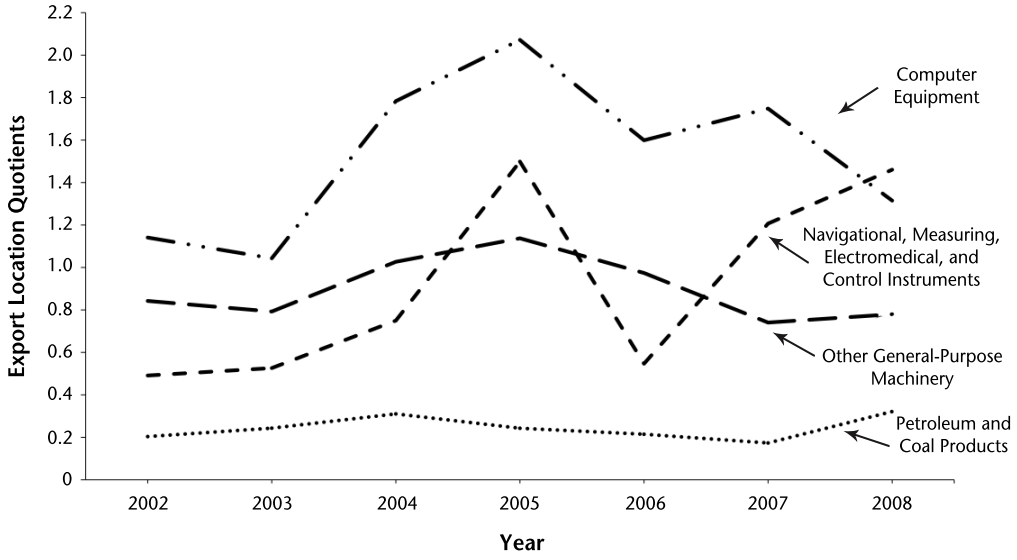

Figure 4. Export location quotients for four Washington State industries by year.

Figure 4 shows the export location quotients by industry. A location quotient is a statistic measuring the economic concentration of industries in a geographic area. I defined and constructed an export location quotient to be the fraction of industry exports to Washington's total exports divided by the fraction of industry shipments to Washington's total shipments. (In other words, the export location quotient is the industry's exports share compared to its share of shipments.) A quotient greater than one indicates a Washington industry exports a greater share than it ships. A quotient less than one indicates a Washington industry ships a greater share than it exports.

Though Washington industries export a greater share of shipments than the national average, only one Washington industry, computer equipment, consistently concentrated on exports. The navigational, measuring, electromedical, and control instruments industry has seen the ratio of its exports to shipments increase in the last several

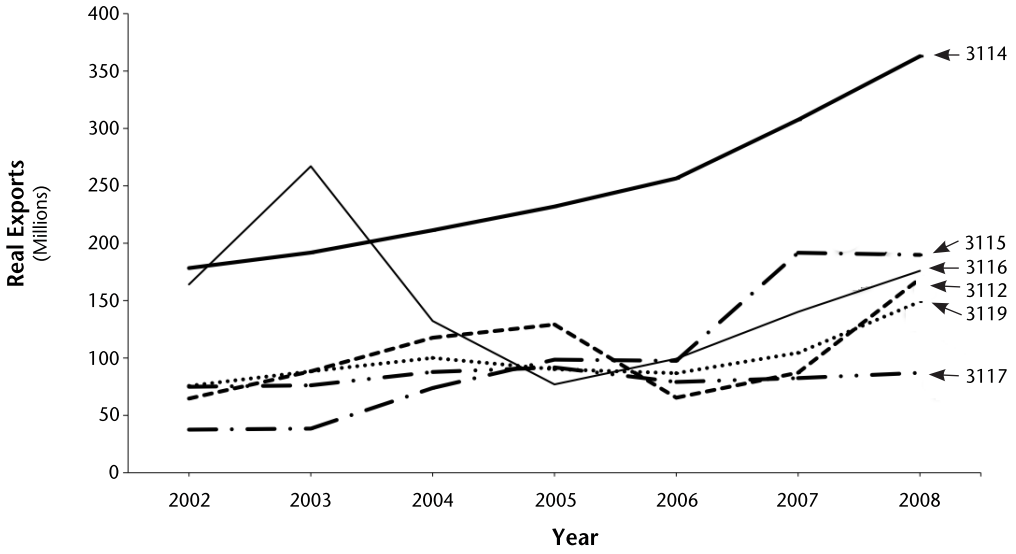

Figure 5a. Real exports of processed agricultural products for Washington State by year.

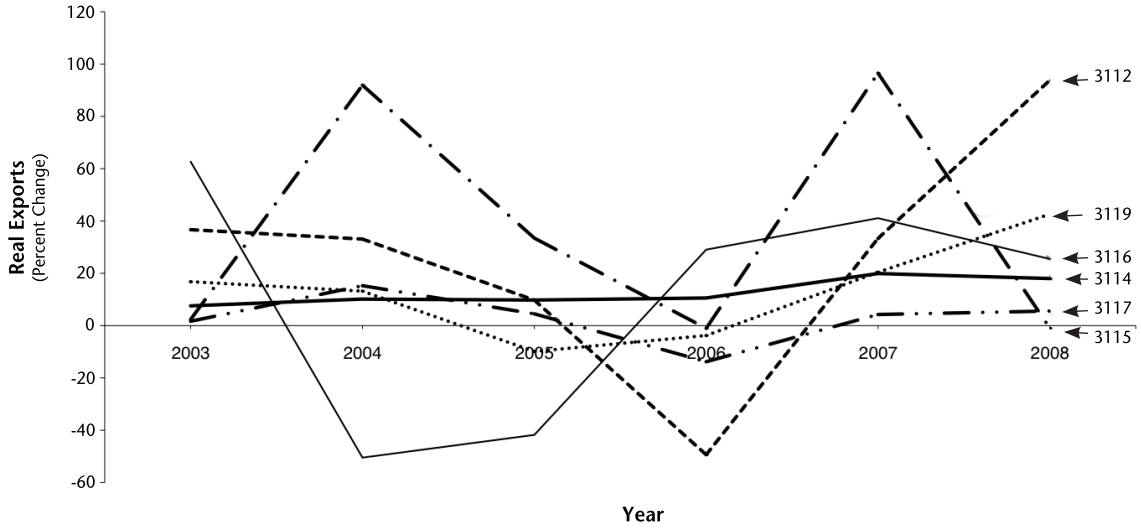

Figure 5b. Year-to-year percent change in real exports of processed agricultural products for Washington State.

3112 Grain and Oilseed Milling Products
3114 Fruit and Vegetable Preserves and Specialty Foods
3115 Dairy Products
3116 Meat Products and Meat Packaging Products
3117 Seafood Products Prepared, Canned, and Packaged
3119 Foods Not Elsewhere Specified or Indicated

years, and thus its export location quotient is increasing.

Inflation-adjusted Processed Agricultural Exports

Throughout this section, I use Census Bureau terminology to familiarize readers with its data categorizations. In some cases, these Census Bureau terms will not match the terminology used within the industry.

The export data on processed agricultural products fall into the "food manufacturing" (NAICS 311) subcategory under "manufacturing" (NAICS 31–33). An agricultural product must be processed in some way to count as a manufactured good. Processing methods include freezing, cutting, and certain kinds of packaging. Thus, the Census Bureau counts many products informally considered agricultural goods as manufactured products. The export data for nonprocessed agricultural products (crop and animal production, NAICS 111 + 112) are not considered because the data collection method attributes goods consolidated at the port of exit to the port state regardless of which state produced the goods. Therefore, the export data for unprocessed agricultural goods for port states such as Washington do not accurately reflect the state's economic activity. See Cassey (2010) for details on Washington's export data and related consolidation issues in port states.

As with total exports, Washington is the fourth largest state in exports of manufactured food products. Within this subsector, Washington's leading export industries are "fruit and vegetable preserves and specialty foods" (NAICS 3114); "meat products and meat packaging products" (NAICS 3116); "grain and oilseed milling products" (NAICS 3112); and "seafood products, prepared, canned, and packaged" (NAICS 3117).

Figure 5a shows the inflation-adjusted (real) value of exports for Washington processed agricultural products industries. Figure 5b shows the same data presented as a year-to-year percent change. The year 2002 is not on the figure because the 2003 point is the percent change from 2002 to 2003; likewise for the other points. The trend for these industries is increasing real exports, though as Figure 5b shows, there is substantial volatility. Exports expand and contract quickly. For example, Washington exports of dairy products (NAICS 3115) doubled from 2003 to 2004 and 2006 to 2007 but were roughly unchanged from 2005 to 2006. Dairy products showed the largest reduction in exports among these industries in 2008, whereas most of the other large processed agricultural products industries in Washington increased exports in 2008.

Figure 6 shows the percent of Washington shipments that were exported from processed agricultural products industries from 2002 through 2008. Comparing Figure 6 to Figure 3 shows that Washington's processed agricultural products

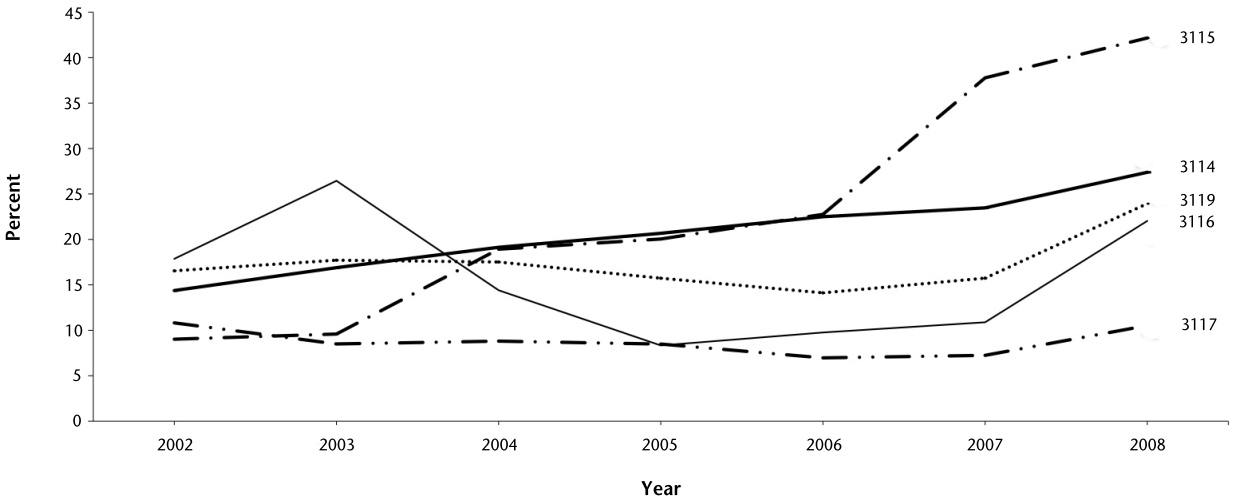

Figure 6. Fraction of processed agricultural shipments exported from Washington State by industry and year.

3112 Grain and Oilseed Milling Products
3114 Fruit and Vegetable Preserves and Specialty Foods
3115 Dairy Products
3116 Meat Products and Meat Packaging Products
3117 Seafood Products Prepared, Canned, and Packaged
3119 Foods Not Elsewhere Specified or Indicated

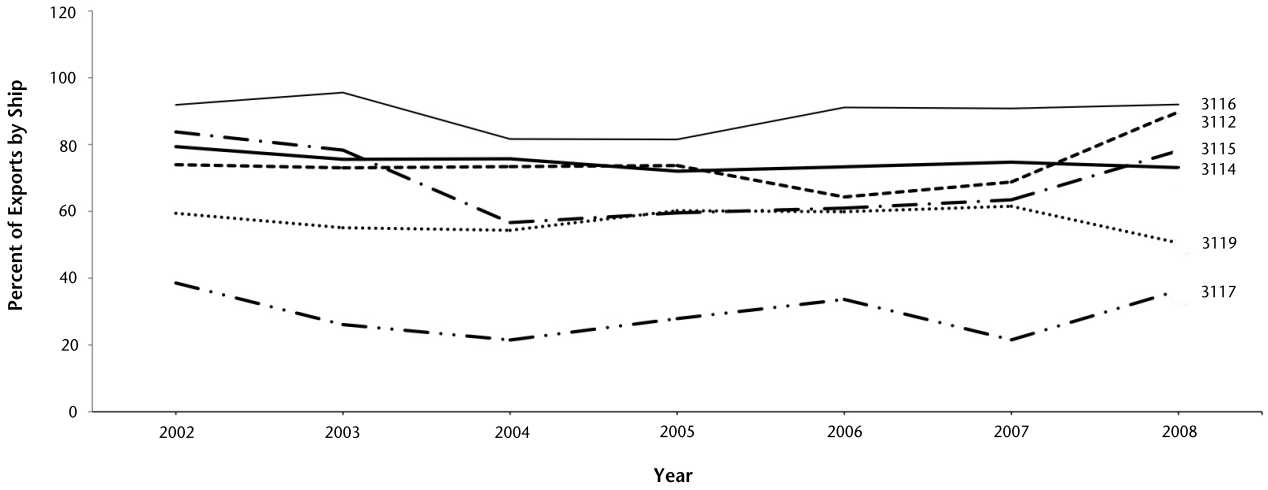

Figure 7. Fraction of Washington processed agricultural exports transported by ship by industry and year.

3112 Grain and Oilseed Milling Products
3114 Fruit and Vegetable Preserves and Specialty Foods
3115 Dairy Products
3116 Meat Products and Meat Packaging Products
3117 Seafood Products Prepared, Canned, and Packaged
3119 Foods Not Elsewhere Specified or Indicated

industries are closer to the national average than Washington's other manufacturing industries in terms of the ratio of exports to total shipments. For example, Figure 6 demonstrates the large decrease in meat product shipments exported after 2003, although they nearly doubled from 2007 to 2008. The data show that the percent of dairy shipments that were exported also doubled in the last several years, increasing from 20 to 40%.

Figure 7, new from the previous issue of Export Trends in Washington State (FS007E), shows the percent of processed agricultural exports that left the United States by ship. Not surprisingly, less than half of seafood products were sent abroad by ship. The percent of products from other industries exported by ship was roughly constant, except for recent increases in grain and oilseed milling products. Contrast this with industries such as aerospace, computer equipment, and navigational, measuring, electromedical, and control instruments (not pictured) that exported less than 2% by ship. Industries manufacturing petroleum and coal products and other general-purpose machinery, on the other hand, exported large percentages by ship. Eighty to 90% of petroleum and coal products were transported by water, compared to 60–70% for other general-purpose machinery.

The Number of Destination Countries for Washington Exports

Figure 8a shows the number of destination countries that Washington firms exported to for five manufacturing industries over the last several years. The overall trend indicates Washington's top five manufacturing industries exported to more countries, although overall Washington exports decreased in 2008 (led by aerospace exports).

The petroleum and coal products industry, which showed the largest increase in exports in 2008, did not export to more countries: 39 in 2008, the same number as in 2005. Therefore, the large percentage increase in petroleum and coal product exports means more went to countries that Washington was already exporting to.

Figure 8b shows the number of destination countries for the six leading processed agricultural export industries. The other miscellaneous food manufacturing industry (NAICS 3119) consistently exported to the most destinations. The other five industries showed a slight overall increase in the number of destinations, gaining 5–10 countries over the last several years.

Summary

The export data reported in this fact sheet are arranged to emphasize the relationships with total shipments in a time series so that trends are easily observed. Manufactured exports, including processed agricultural products, generally increased since 2002. Total Washington exports, however, decreased in 2008, as did aerospace industry exports, which still accounted for the bulk of Washington exports, though less so in 2008. Both the overall decrease in Washington exports

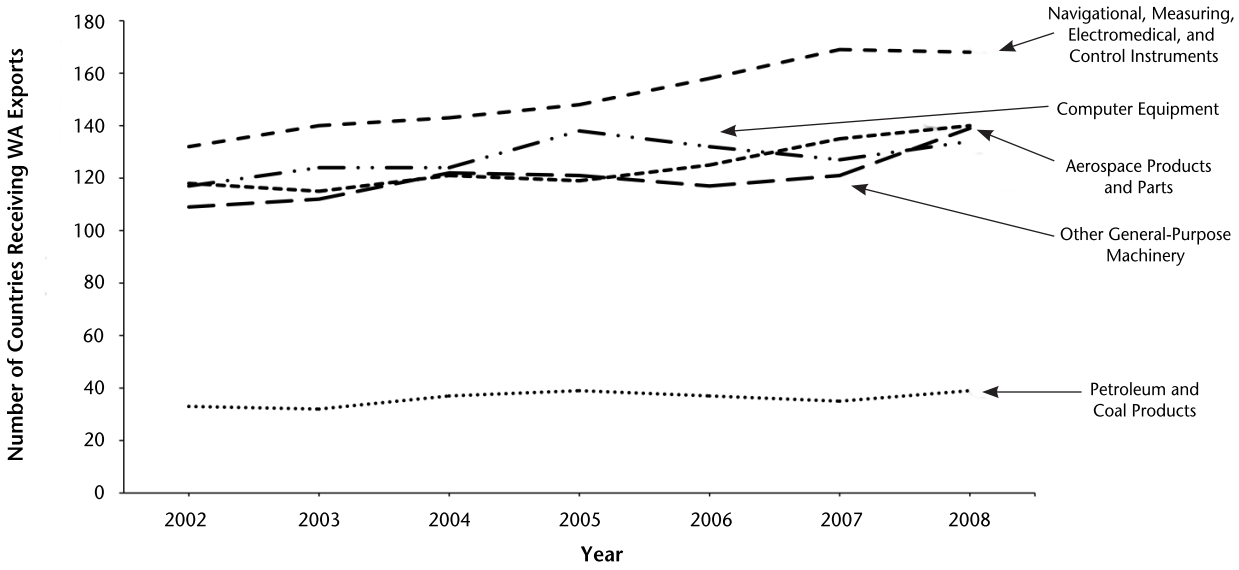

Figure 8a. The number of destination countries for Washington State manufacturing products by year.

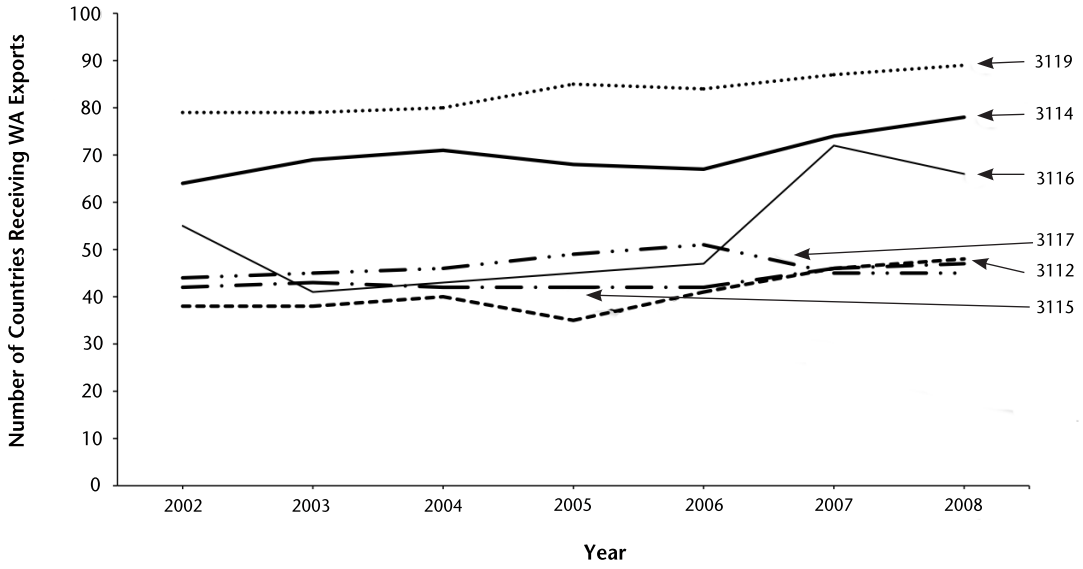

Figure 8b. The number of destination countries for Washington State processed agriculture products by year.

3112 Grain and Oilseed Milling Products
3114 Fruit and Vegetable Preserves and Specialty Foods
3115 Dairy Products
3116 Meat Products and Meat Packaging Products
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and aerospace's decreasing dominance in their composition were likely due to the Boeing strike in fall of 2008 (as well as the U.S. Census Bureau data revision decreasing Washington aerospace exports from 2004–2007).

Though the overall value of Washington exports decreased in 2008, some industries, such as petroleum and coal products and fruit and vegetable preserves, increased their exports. Also, most Washington industries exported to more countries in 2008.

References

Bernard, A.B. and J.B. Jensen. 1995. Exporters, Jobs, and Wages in U.S. Manufacturing: 1976–1987. In Brookings Papers on Economic Activity: Microeconomics, pp. 67-112. M. N. Baily, P. C. Reiss, and C. Winston, eds. The Brookings Institution, Washington, DC.

Cassey, A.J. 2010. The Collection and Description of Washington State Export Data. Washington State University Extension, FS006E. http://cru.cahe.wsu.edu/CEPublications/FS006E/FS006E.pdf

U.S. Bureau of Labor Statistics. Various years. Consumer Price Index. Washington, DC. http://www.bls.gov/cpi

U.S. Census Bureau. Various years. Geographic Area Statistics. Annual Survey of Manufactures. Washington, DC. http://www.census.gov/manufacturing/asm/

U.S. Census Bureau. 2002 and 2007. Economic Census. Washington, DC. http://www.census.gov/econ/census07/

U.S. Department of Commerce. Various years. TradeStats Express™. Presented by the Office of Trade and Industry Information, International Trade Administration, using data from the Foreign Trade Division of the U.S. Census Bureau. http://tse.export.gov/

World Institute for Strategic Economic Research. Various years. Origin of Movement State Export Data. http://www.wisertrade.org/home/index.jsp?content=/data/dataseries.jsp#stexp

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