

# Export Trends in Washington State

## Volume 5

WASHINGTON STATE UNIVERSITY EXTENSION FACT SHEET • FS105E

### Abstract

Accurate descriptions of export trends are needed so industry representatives, analysts, policymakers, and business owners can properly assess market conditions. This fact sheet provides data on manufactured and processed agricultural exports from Washington State to foreign markets for several large industries, including aerospace and fruit and vegetable preserves. Unlike other export data sources, the data here can be used to compare export changes over time.

This is the fifth edition of an annual series. New material includes 2011 export data and a figure showing how export concentration is trending over time. The data show Washington exported more in 2011 than any year since 2002. Additionally, we examine how Washington's exports changed as a number of U.S. free trade agreements entered into force.

### Introduction

This volume of "Export Trends in Washington State" is the fifth fact sheet in a series of WSU Extension publications providing Washington exports information. The WSU Extension publication "The Collection and Description of Washington State Export Data" (Cassey 2010) includes a description of the process by which the Washington State export data used in this series are collected, along with interpretation limitations and definitions for many technical terms.

This fact sheet includes data that depict trends in Washington exports by industry from 2002 to 2011. The data are presented as an inflation-adjusted time series, which allows export values to be compared over time. These figures also emphasize the relationships between Washington's individual export industries and its overall state-level exporting activity. The industries studied include some of the largest in the state—for example, the aerospace products and parts industry. Special attention is also given to processed agricultural products industries such as fruit and vegetable preserves.

New information in this fact sheet includes updated export figures with 2011 data and tables listing the changes in Washington State's top export markets and industries between 2011 and 2005–10. Also new to this volume are figures showing how Washington exports changed before and after several free trade agreements took effect. Because three U.S. free trade agreements were signed into law in 2011 (with Colombia, Korea,

and Panama), these figures illustrate what may happen once these agreements are implemented.<sup>1</sup>

The World Institute for Strategic Economic Research (<http://www.wisertrade.org>) is the source for Washington's exports data. In "The Collection and Description of Washington State Export Data," Cassey (2010) provides a full description of these data and how they are collected. The key feature of the state export data is its focus on the location from which exporting begins rather than on the location from which exported goods are produced. This has important implications for the accuracy of data interpretation and conclusions. Refer to Cassey (2010) for a more detailed discussion.

Though the origin-of-movement state export data are only available for purchase, some Washington State export data can be obtained at no cost from TradeStats Express™ (<http://tse.export.gov/>). In this fact sheet, all nominal export data have been adjusted for inflation using the annual values from the Consumer Price Index (CPI) in the Seattle-Tacoma-Bremerton area. (These CPI data are for all urban consumers for all items less food and energy and are available from the Bureau of Labor Statistics (BLS) at <http://www.bls.gov/cpi>, Series ID: CUUSA423SA0L1E.) The base year used is the 1982–1984 average.<sup>2</sup> This means that the dollar value of the

<sup>1</sup> The agreements with Colombia and Korea began implementation in 2012.

<sup>2</sup> This base year is the standard used by the BLS. Any year may be the base year without changing the data's meaning. For convenience, we use the standard BLS base year.

data provided 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 subsequent figures, along with the associated data in tabular form, can be found on the website for Washington State University's School of Economic Sciences at ([http://www.impact.wsu.edu/survey/Extension\\_Exports/export\\_data.htm](http://www.impact.wsu.edu/survey/Extension_Exports/export_data.htm)).

## Washington State's Leading Export Industries and Top Destinations

Table 1 lists Washington's leading manufacturing export industries in 2011 and in 2005–10 to show the changing composition of Washington's exports. The export values of listed industries in 2005–10 are the inflation-adjusted arithmetic mean over the 6-year period. The share column for each time period shows industry exports relative to the Washington manufacturing export total. The top ten export industries in 2011 accounted for over \$17 billion in inflation-adjusted export value, or approximately 80% of the total.

The composition of Washington's leading export industries is relatively stable between 2011 and 2005–2010. The leading industries in 2011 are the same as those in 2005–10 with two exceptions. The computer equipment industry ranked 10th in 2005–10, but it is no longer in the top ten in 2011. Though we

tracked exports of computer equipment in previous volumes of this fact sheet, because it is no longer a top ten export industry for Washington, we drop it from further analysis. The basic chemicals industry replaces computer equipment in the top ten.

As usual, the aerospace industry dominates, with 55% of all Washington's manufacturing exports. Although aerospace remains a dominating export sector, its share of total Washington's manufacturing exports decreased. This is due to export gains by other export industries, particularly the petroleum and coal products industry, whose exports more than doubled in 2011. The top four export industries in 2011 remain the same as those in 2005–10. In the next section, we select five leading export industries from Table 1 to examine export trends over time. Note that though the rank of export industries is roughly the same, almost all industries increased their exports, except for semiconductors and other electronic products and miscellaneous manufactured commodities. Furthermore, those industries that increased exports did so by a large margin over the 2005–10 average. Nonferrous metals and basic chemicals, for example, nearly doubled their exports in 2011.

Because of the prominent role of agriculture in Washington's overall economy, Table 2 lists the top nine export industries in the processed agricultural products sector. In 2011, processed agricultural products exports increased by about 25% compared with the 2005–10 average. Exports increased for all industries except grain and oilseed milling products. The fruit and vegetable preserves industry remained

Table 1. Top 10 Washington manufacturing export industries.

INDUSTRY	2011			2005–10		
	Rank	Exports (millions)	Share (percent)	Rank	Exports (millions)	Share (percent)
Aerospace	1	11867.75	55.30	1	10487.59	59.86
Petroleum & Coal Products	2	1584.54	7.38	2	755.32	4.31
Nav, Meas, Electromed & Control Instruments	3	744.44	3.47	3	617.56	3.53
Pulp, Paper & Paperboard Mill Products	4	464.77	2.17	4	374.21	2.14
Fruit & Vegetable Preserves	5	446.64	2.08	8	312.05	1.78
Nonferrous Metals	6	446.17	2.08	9	251.45	1.44
Basic Chemicals	7	443.00	2.06	11	247.08	1.41
Other General Purpose Machinery	8	438.00	2.04	5	355.23	2.03
Semiconductors & Other Electronic Products	9	316.14	1.47	6	334.78	1.91
Miscellaneous Manufactured Commodities	10	301.77	1.41	7	334.29	1.91
TOTAL		17053.22	79.47		14069.55	80.31

Notes: 2005-10 exports are the inflation-adjusted arithmetic mean of export values over the 6-year period. Share is Washington's industry export relative to Washington's total manufacturing exports. The export value of computer equipment ranked 10th in 2005-10, but it is not in the top ten in 2011.

Table 2. Top 9 Washington processed agricultural export industries.

INDUSTRY	2011			2005–10		
	Rank	Exports (millions)	Share (percent)	Rank	Exports (millions)	Share (percent)
Fruit & Vegetable Preserves	1	446.64	35.43	1	312.05	31.09
Dairy Products	2	212.07	16.82	3	138.52	13.80
Meat & Meat-Packing Products	3	147.62	11.71	4	125.99	12.55
Foods Not Elsewhere Specified	4	146.35	11.61	5	119.29	11.88
Grain & Oilseed Milling Products	5	129.78	10.29	2	148.52	14.80
Seafood Products, Canned, Prepared	6	90.34	7.17	6	83.36	8.30
Animal Foods	7	32.03	2.54	7	28.07	2.80
Bakery & Tortilla Products	8	29.29	2.32	8	24.53	2.44
Sugar & Confectionery Products	9	26.63	2.11	9	23.45	2.34
TOTAL		1260.75	100.00		1003.77	100.00

Notes: 2005-10 exports are the inflation-adjusted arithmetic mean of export values over the 6-year period. Share is Washington's industry exports relative to Washington's processed agricultural exports.

the largest exporter. Dairy products experienced a nearly 50% increase in exports, moving up from 3<sup>rd</sup> place to 2<sup>nd</sup> place. Grain and oilseed milling products experienced a decrease in exports by about 12%, dropping to 5<sup>th</sup>. Until 2011, the grain and oilseed milling products industry has been a hot export industry, though Washington does not produce much in this industry. Rather, these products were passing through and exiting the state. Since the share of the 6<sup>th</sup> place seafood products is 7.17%, whereas the share of the 7<sup>th</sup> place animal foods is only 2.45%, in the following section we only focus on the top six industries

Table 3 lists major markets receiving Washington manufacturing exports in 2011 and the average of

2005–10. The percent of the listed market is the share of total manufacturing exports each market received. The top 10 markets received about 60% of Washington's manufacturing exports. In 2011, manufacturing exports to the top 10 markets increased by about 25% over the average of 2005–10.

The top four markets of Washington manufacturing exports are the same in both periods: Canada, China, Japan, and United Arab Emirates (UAE). Exports to all major markets increased except to Japan, which imported about 12% less than in 2005–10. That the UAE is a large importer of Washington goods is noteworthy because it is a small country. A closer look at the data shows that it did not import a broad range of Washington goods. Rather, it

Table 3. Top 10 markets receiving Washington manufacturing exports.

COUNTRY	2011			2005–10		
	Rank	Exports (billions)	Share (percent)	Rank	Exports (billions)	Share (percent)
Canada	1	3.24	15.10	1	2.90	16.55
China	2	2.45	11.42	2	1.95	11.12
Japan	3	1.68	7.84	3	1.93	11.03
United Arab Emirates	4	1.15	5.35	4	0.89	5.09
United Kingdom	5	0.87	4.05	9	0.54	3.07
Hong Kong	6	0.81	3.77	16	0.39	2.20
Turkey	7	0.77	3.57	18	0.27	1.53
Australia	8	0.74	3.44	14	0.40	2.30
South Korea	9	0.72	3.37	5	0.66	3.77
Ireland	10	0.59	2.75	8	0.57	3.24
TOTAL		13.02	60.66		10.49	59.90

Notes: 2005-10 exports are the inflation-adjusted arithmetic mean of export values over the 6-year period. Share is manufactured exports to each listed market relative to Washington's manufactured exports to the world. Three markets that were in the top 10 list in 2005-10 (India [6th], Taiwan [7th], and Singapore [10th]), are not in the top 10 list in 2011.

received a great deal from the aerospace industry, of which Washington State is a world leader. Hong Kong, Turkey, and Australia newly enter the top ten destinations for Washington goods, having previously been 16<sup>th</sup>, 18<sup>th</sup>, and 14<sup>th</sup> respectively. Exports to each of these countries increased dramatically in 2011, and though each of these countries increased its imports from Washington's leading export industries, the lion's share of the increase was in the aerospace products and parts industry. Exports to South Korea increased by 9%, but the increase is small relative to other major markets, moving its rank from 5<sup>th</sup> place to 9<sup>th</sup>. India, Taiwan, and Singapore dropped from the list of top receiving countries in 2011. Table 3 shows that, unlike industries, Washington's export destinations are not stable after the top four destinations.

To examine processed agricultural exports to major markets, six industries were selected from Table 2 based on the importance of an industry in exporting to Washington's agricultural economy. In parallel with Table 3, Table 4 lists the top ten markets receiving processed agricultural exports from the selected six industries. These ten markets made up over 80% of exports in both periods. In 2011, exports to all the major markets increased, resulting in an overall gain of about 25% relative to base period 2005–10. The list of top ten markets receiving processed agricultural exports was stable relative to the top ten recipients of manufacturing exports. Fewer markets were added or dropped from the list between the two time periods, and most major markets kept their

ranks. The biggest change is that Hong Kong entered the top ten, replacing Australia in 2011.

## Washington Export Patterns in Total and by Selected Industry

### Inflation-Adjusted Total Exports

In 2011, Washington State exports increased by an inflation-adjusted \$3.35 billion compared with 2010, a 19% increase. As Figure 1 shows, this large increase in total exports was preceded by a slight decline in exports in 2010. In general, state exports had been flat since 2008 and were down from the 2007 peak of export values, but state exports in 2011 climbed to the highest level in the last 10 years.

Figure 1 also shows that the aerospace products and parts industry increased exports in 2011, more than 10% from a year earlier and the highest level since 2007. The aerospace industry export trend resembles Washington's state export statistics because aerospace is the dominant export industry in Washington.

The bulk of the increase in Washington's exports is due to aerospace, but other large export industries also grew in 2011. This is seen in Figure 2. Petroleum and coal products, navigational, measuring, electromedical, and control instruments, pulp, paper, and paperboard mill products, and other general-purpose machinery (includes goods such as pumps, compressors, and material handling equip-

Table 4. Top 10 markets receiving Washington processed agricultural exports.

COUNTRY	2011			2005–10		
	Rank	Exports (millions)	Share (percent)	Rank	Exports (millions)	Share (percent)
Japan	1	216.38	18.45	1	171.88	18.53
Canada	2	213.07	18.17	2	171.86	18.52
Philippines	3	133.73	11.40	3	92.33	9.95
Mexico	4	103.67	8.84	4	69.05	7.44
China	5	80.99	6.91	5	59.44	6.41
South Korea	6	46.36	3.95	6	39.76	4.29
Hong Kong	7	37.33	3.18	12	25.54	2.75
United Kingdom	8	36.93	3.15	9	28.44	3.07
Taiwan	9	36.85	3.14	10	27.58	2.97
Indonesia	10	36.13	3.08	7	32.34	3.49
TOTAL		941.44	80.27		748.31	80.66

Notes: 2005-10 exports are the inflation-adjusted arithmetic mean of export values over the 6-year period for the following six industries: fruit & vegetable preserves, grain & oilseed milling products, dairy products, meat & meat-packing products, seafood products prepared, canned, and packaged, and foods not elsewhere specified. Share is the exports from these six industries to each listed market relative to Washington's exports from these industries to the world. Australia ranked 8th in 2005-10, but is not in the top 10 in 2011.

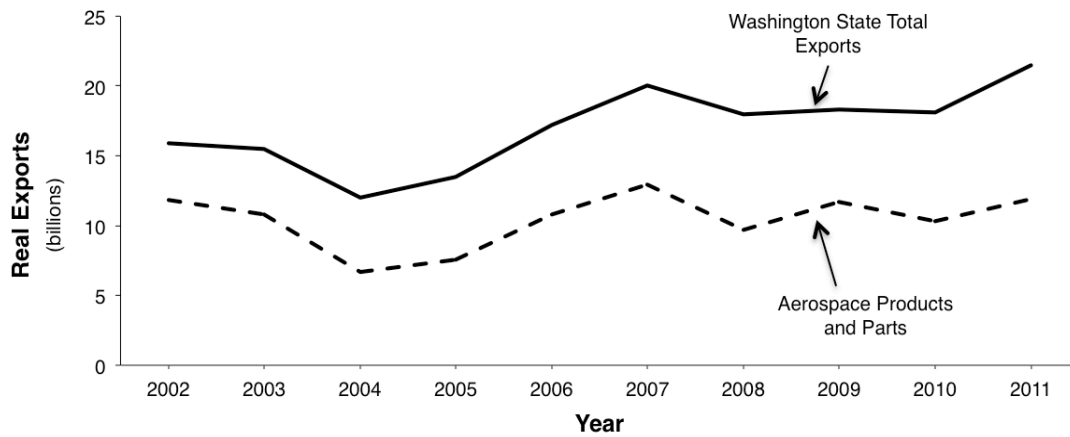


Figure 1. Inflation-adjusted exports for Washington State aerospace products and parts and total exports to the world by year.

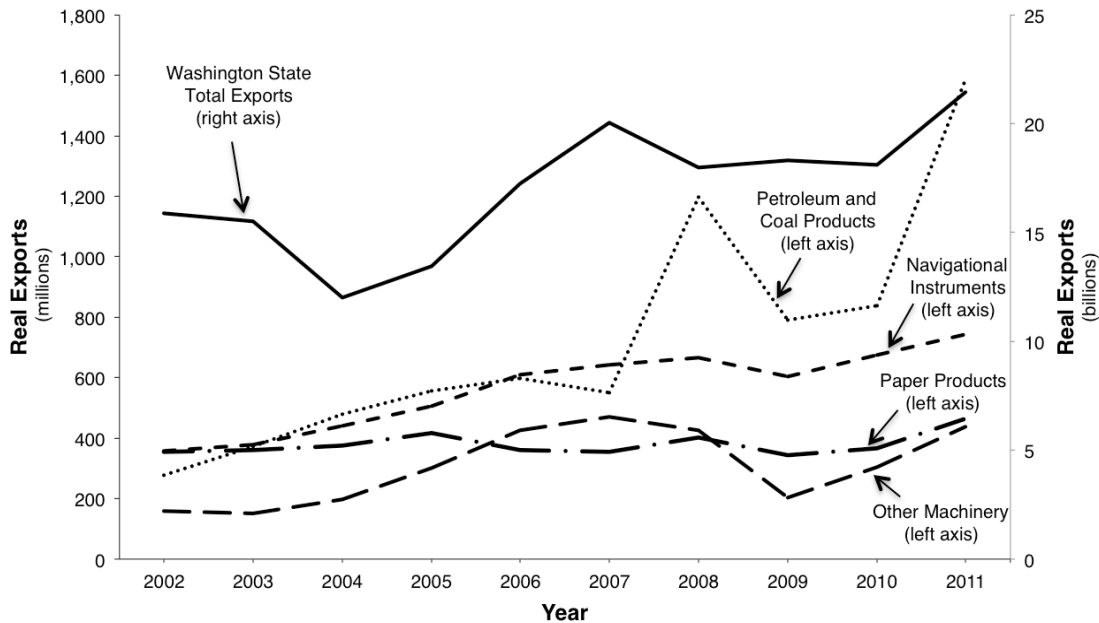


Figure 2. Inflation-adjusted exports for four Washington State industries and total exports to the world by year.

ment) all experienced an increase in inflation-adjusted export value. Total Washington State export data were taken from Figure 1 (scale is on the right axis of Figure 2), so that the trend in exports for these five industries can be compared to the state's export trend. The difference in scale is by a factor of 20, revealing that the other large export industries were dwarfed by the aerospace industry.<sup>3</sup>

The only one of Washington's leading export industries to see a decline in exports in 2011 was comput-

<sup>3</sup> Nonferrous metals and basic chemicals passed other machinery in 2011 in terms of leading export industries. We do not include these industries in the figures because without more recent data, we are not sure if this is a one-time event or a permanent trend. We will monitor them carefully in future volumes.

er equipment, down over 4% from a year earlier. The 2011 export value is the lowest level over the past decade. This industry has declined in export value steadily since 2005 and, as a result of its persistent decrease, it was not in the top 10 list of Washington's leading export industries in 2011. Therefore, we do not include it in Figure 2 or other figures.

Figures 1 and 2 show that most of Washington's export industries experienced export growth in 2011. Figure 3 shows how much exports grew by industry as the percent change from 2010. Petroleum and coal products had the largest gain, an increase of nearly 90%, followed by other machinery at just over 40%, and paper products at just over 25%.

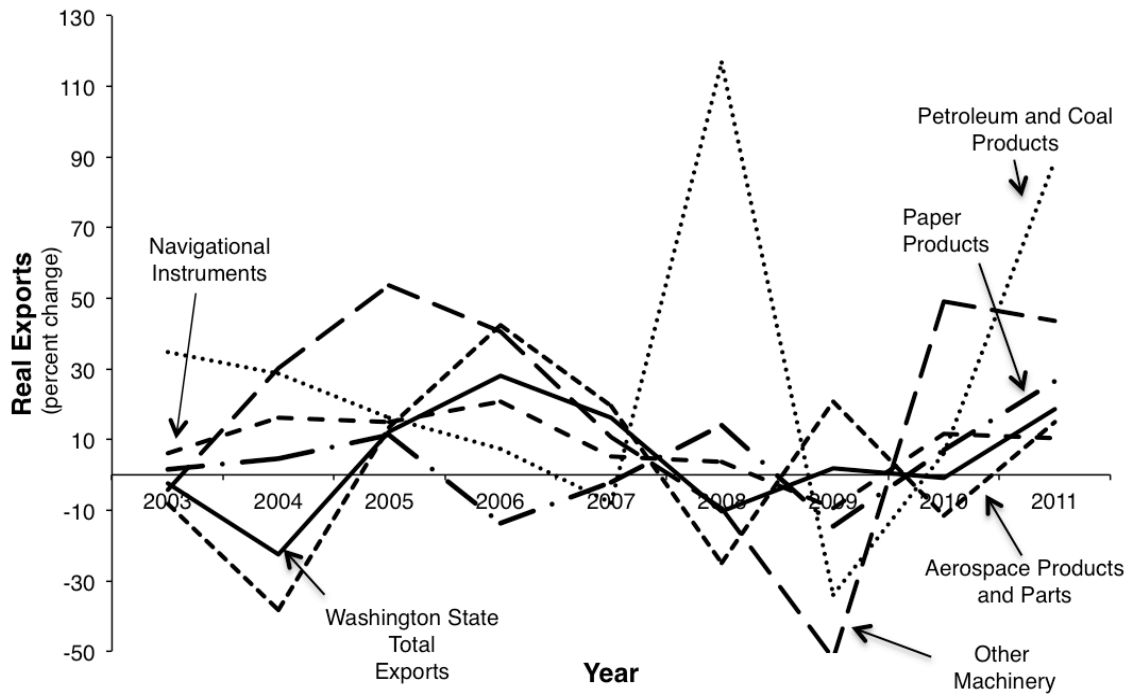


Figure 3. Year-to-year percent change in real exports of five Washington State industries.

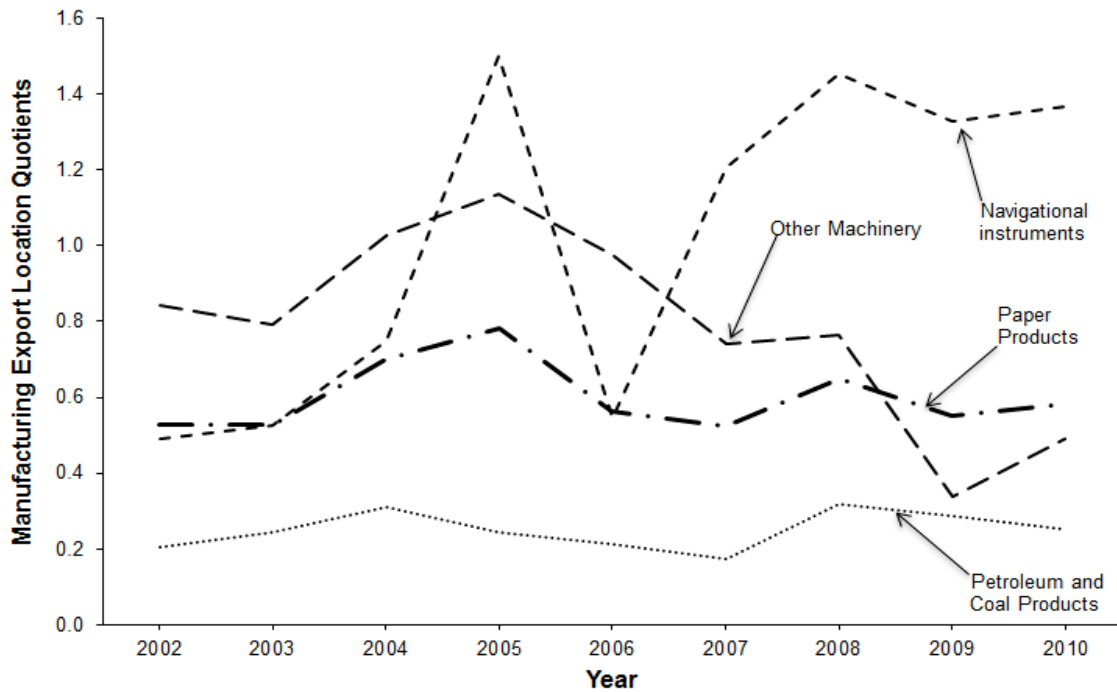


Figure 4. Export location quotient for five Washington State industries by year.

Petroleum products only increased 6% in 2010. Overall state exports increased 18% and aerospace exports increased 15%. Figure 3 does not include 2002 since the 2003 point is the percent change from 2002 to 2003; likewise for the other points.

Figure 4 shows the export location quotients by industry. A location quotient is a statistic measuring the economic concentration in an industry relative to the overall state concentration. To be more precise, we define export location quotient as the

fraction of industry exports to industry shipments divided by the fraction of Washington's total exports to Washington's total shipments. A quotient greater than one indicates an industry is more concentrated in export activities than Washington overall. Data from the Census Bureau on shipments is available from 2002–10.

Except for 2005, the only industry that is concentrated in exports more than Washington is the navigational instruments industry. This can be seen in Figure 4 as the only industry greater than one. Thus Washington's other leading export industries, such as petroleum products and paper products, are actually concentrated in domestic sales. The reason is that the aerospace industry is highly concentrated in exports, and thus increases the state's concentration.<sup>4</sup> Thus, though Washington is among the U.S. leaders in exporting as a fraction of overall shipments, most of Washington's leading export industries are concentrated in domestic shipments.

### Inflation-Adjusted Processed Agricultural Exports

Throughout this section, we use Census Bureau terminology and its data categorizations to facilitate export examination. In some cases, these Census Bureau terms will not match the terminology used within the industry.

<sup>4</sup>The aerospace products and parts industry is not pictured in Figure 4 because the Census Bureau does not release shipments data for that 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 considered processed if it is to count as a manufactured good. Processing methods include freezing, cutting, and packaging. Thus, the Census Bureau counts many products informally considered agricultural goods as manufactured products. The export data for unprocessed agricultural products (crop and animal production, NAICS 111 + 112) are not considered because the data collection method used attributes goods to the port state regardless of what state actually produced the good. Consequently, 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.

Washington is the fourth largest state in exports of manufactured food products. As Table 2 shows, Washington's leading export industries include fruit and vegetable preserves and specialty foods, dairy products, meat and meat-packaging products, foods not elsewhere specified, grain and oilseed milling products, and seafood products, prepared, canned, and packaged.

Figure 5 shows the inflation-adjusted export value for Washington processed agricultural products industries. As with manufacturing exports, most major agricultural industries increased exports in 2011 over 2010. The fruit and vegetable preserves indus-

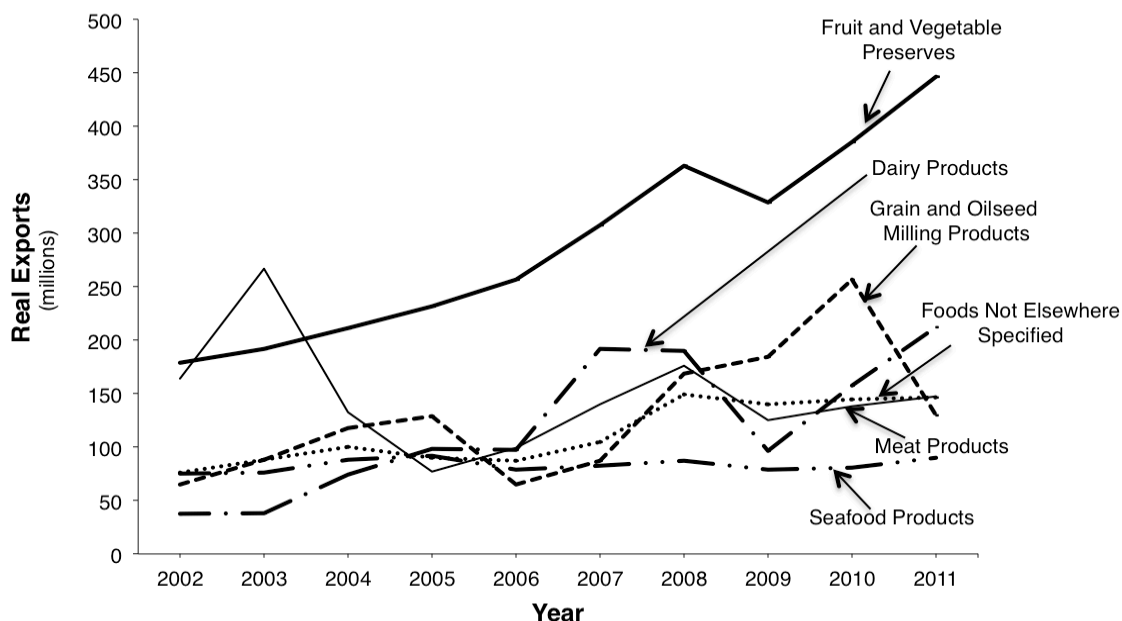


Figure 5. Real exports of processed agricultural products for Washington State by year.

try continues its strong export growth. It is by far the most important export industry in the processed foods category, accounting for 35% of exports. Dairy products rebounded from down years in 2009 and 2010. On the other hand, grain and oilseed milling products suffered its first decrease in exports since 2006. This industry has been Washington's most successful sector in terms of export expansion during that time. However, grain and oilseed milling production is a pass-through industry, meaning that many exports could have been produced in another state before being consolidated and shipped from Washington. Thus, this decrease in 2011 exports

could be the result of a change in shipping patterns rather than a decrease in exports per se.

Figure 6 shows the year-to-year percent change in exports. Compared to the industries in Figure 3, processed agricultural products industry exports show greater volatility, expanding and contracting quickly. For example, Washington exports of dairy products have oscillated from years of tremendous expansion to years of contraction.

Besides dairy products, which increased 35%, other industries that increased exports include vegetable

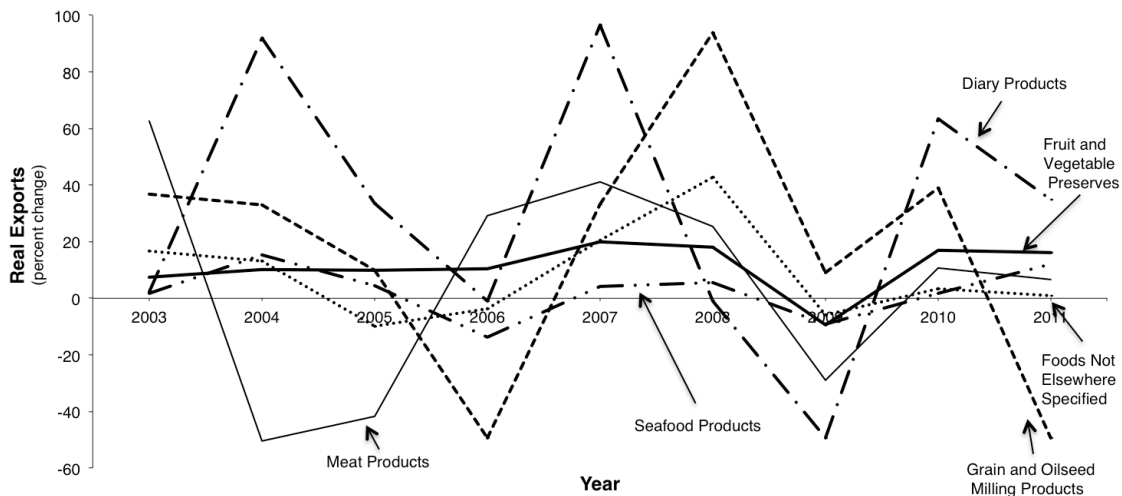


Figure 6. Year-to-year percent change in real exports of processed agricultural products for Washington State.

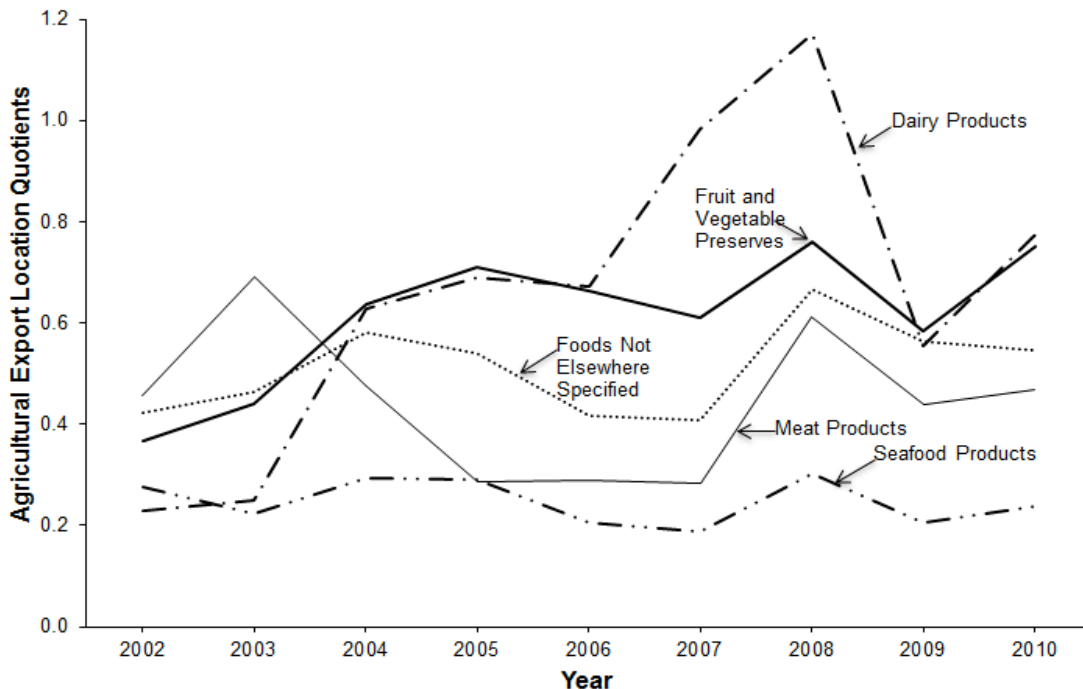


Figure 7. Export location quotient for five Washington State processed agricultural industries by year.

preserves at 16%, and seafood products prepared, canned, and packaged at 12%. The only decrease was a large contraction, however. Grain and oilseed milling products exports shrank nearly 50% in 2011.

Figure 7 shows export location quotient for selected processed agricultural products industries. Other than dairy products in 2008, the export location quotient for Washington's processed agricultural industries is less than one, indicating that these industries are concentrated in domestic sales.

## Washington Exports and Trade Agreements

Free trade agreements between the United States and other countries reduce tariff barriers to Washington exports. A tariff is a tax on an import, which makes the price of an American good greater than it otherwise would be. Tariff rates have been declining worldwide for most of the last fifty years, but these declines are not uniform across countries or across goods. The United States negotiates bilateral free trade agreements with specific countries. Though some exceptions may occur, typically these agreements mean that neither the United States nor the partner country may put a tariff on the entire spectrum of the other's goods. In 2011, the U.S. negotiated free trade agreements with Colombia, Panama, and South Korea. This brings the total number of agreements to 19 countries. In order to inform what *may* happen to Washington exports with the three countries recently signed to agreements, in the following figures we show Washington inflation-adjusted exports before and after thirteen previous free trade agreements for which there is enough data for analysis.

We split countries into large export destinations for U.S. goods to correspond to the potential of South Korea and also to small export destinations for U.S. goods to correspond to Panama. Figure 8 shows the value of Washington exports to each market before and after the free trade agreement was implemented with that country. Figure 8a shows the large export destinations and Figure 8b shows the small export destinations. We have centered the data around the implementation date of the agreement. Therefore, the x-axis is years before the agreement and years after the agreement.

Figure 8 makes clear that a free trade agreement does not automatically increase exports as soon it is implemented. Of the thirteen free trade agreements for which we have data, in the first year after an agreement, Washington exports increased to eight countries, but decreased to five countries. How-

ever, Washington exports do increase to most free trade partners five years or so after the agreement is implemented. Singapore is a notable exception.

Figure 9 focuses on processed agricultural exports from Washington before and after the United States implemented free trade agreements. As in Figure 8, we split Figure 9 into large export destinations (panel a) and small export destinations (panel b). Unlike total manufacturing exports, Washington often sees an initial boost to exports in processed agricultural products after the implementation of a free trade agreement. Washington's processed agricultural exports increase, on average, about 24% in the first year after the free trade agreement, whereas they only increase 3% on average the year the agreement is implemented. Australia, for example, received far fewer exports from Washington overall after the free trade agreement was implemented, but took in far more processed agricultural goods. Even though many countries show decreases in exports in subsequent years, all countries receive more goods from Washington after the free trade agreement is implemented.

## Summary

2011 was a banner year for Washington exports. Washington exported more inflation-adjusted export value in 2011 than in any year in the previous decade. In total, Washington's exports increased 18% over 2010. This export gain was widespread across many leading industries. Though the aerospace industry increased exports by 15% and remains by far the dominant export industry in Washington State, the trend is for other industries, such as petroleum and coal products and fruit and vegetable preserves, to increase their share of Washington's exports. Nonetheless, the composition of Washington's leading export industries was relatively unchanged in 2011 compared with the average of 2005–10. That is not the case for Washington's export destinations, where considerable change has taken place. Previously leading destinations, such as India, Taiwan, and Singapore have been replaced on the top ten list by Australia, Hong Kong, and Turkey. While it is too early to say if this is a random one-year event or a new trend, we will keep an eye on the 2012 export data.

Computer equipment, once commonly associated with Washington, continued its 6+ year decline and, as of 2011, has fallen out of the top ten leading export industries. On the other hand, fruit and vegetable preserves continues its tremendous export growth. Dairy products had a banner year in 2011, after a few down years recently.

Figure 8a

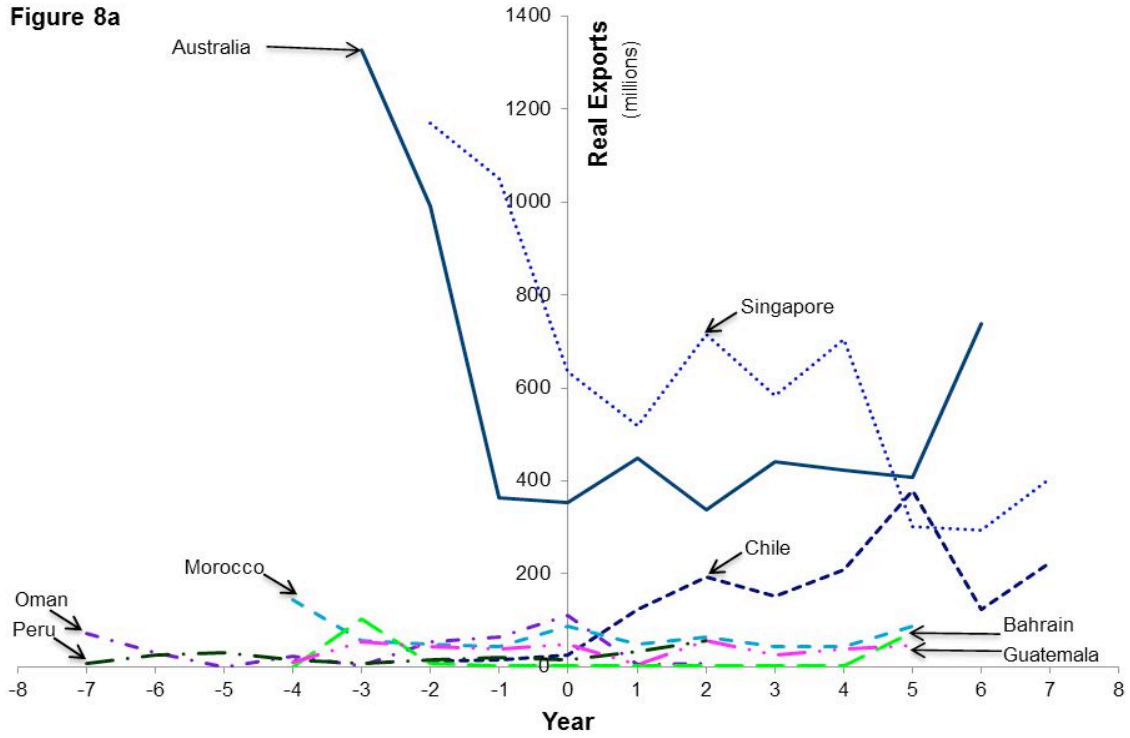


Figure 8b

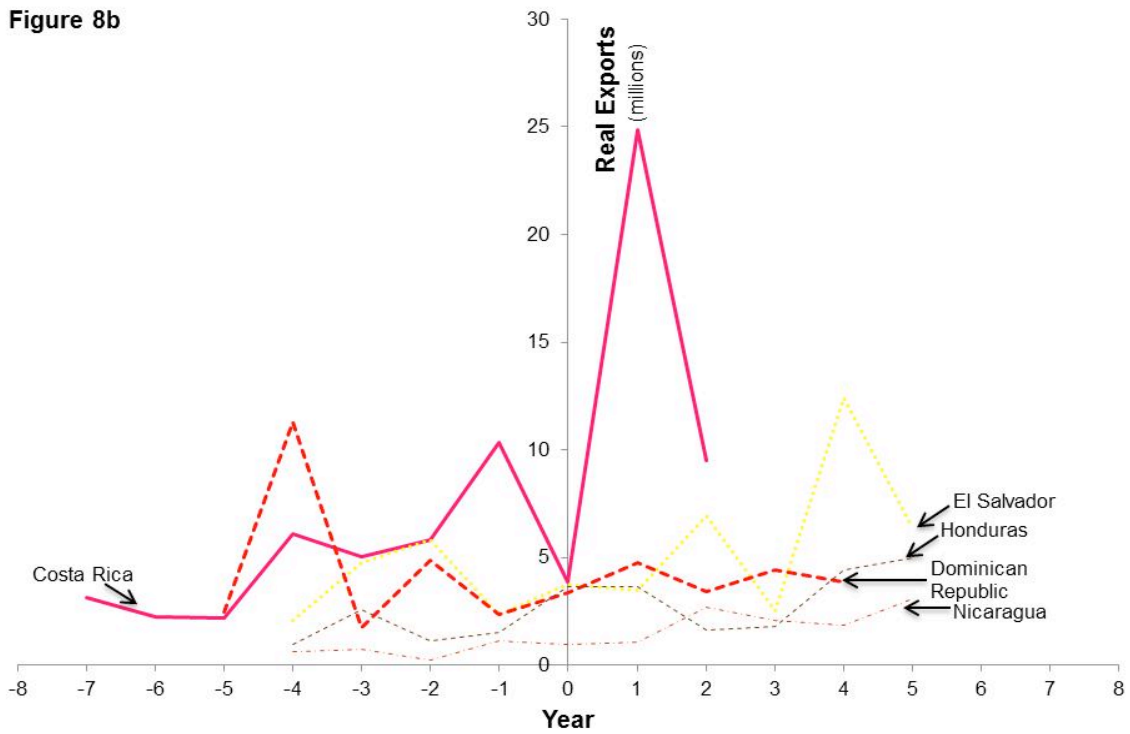


Figure 8. Inflation-adjusted exports for Washington State manufacturing products by country with a free trade agreement with the United States. The figure is centered around the year the agreement is implemented, marked 0. Years before the agreement are negative and years after the agreement are positive. Panel a shows large export partners whereas panel b shows small export partners.

Figure 9a

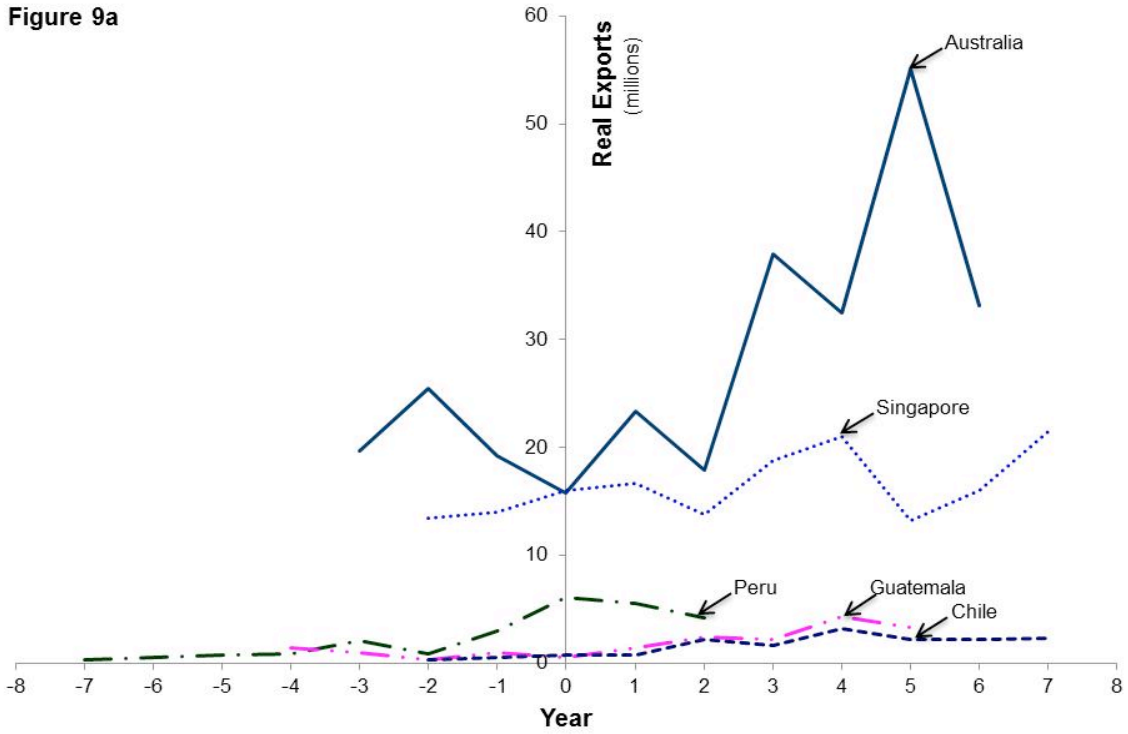


Figure 9b

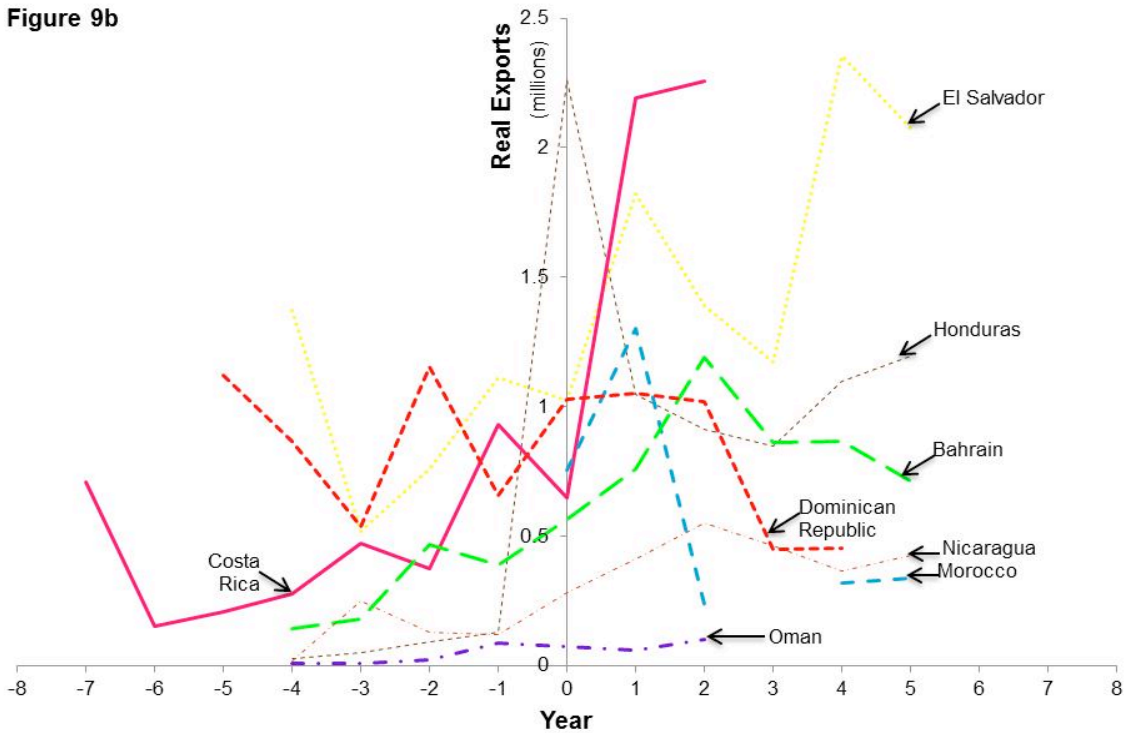


Figure 9. Inflation-adjusted exports of Washington State processed agricultural products to the U.S. free trade agreement small importers by year. The figure is centered around the year the agreement is implemented, marked 0. Years before the agreement are negative and years after the agreement are positive. Panel a shows large export partners whereas panel b shows small export partners. The following six industries are included: fruit & vegetable preserves, grain & oilseed milling products, dairy products, meat & meat-packing products, seafood products prepared, canned, and packaged, and foods not elsewhere specified. Data are not available for all years for Morocco.

The United States signed three trade agreements in 2011, with Colombia, Panama, and South Korea. The agreements with Colombia and South Korea entered into force in 2012, and the agreement with Panama is pending but will enter into force soon. Though we cannot forecast what these agreements will mean for Washington exports, we show what happened after previous free trade agreements with 13 countries. Though overall exports were mixed after these free trade agreements, processed agricultural exports show initial gains in exports that remain greater than the pre-agreement level.

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