

Virginia International Trade Profile

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Executive Summary

Virginia International Trade Profile

Swift integration of international markets and the rapid expansion of a global consumer class have ushered in a new era that is driving state and metro areas to more intentionally engage in the global economy. The vast majority of economic growth worldwide over the next several decades is projected to occur outside the United States. U.S. firms are increasingly taking advantage of these dynamics, boosting national exports to a record \$2.35 trillion in 2014. In the five years following the recession (2009-2014), exports accounted for 27% of U.S. economic growth. Further, exports support local jobs. In 2014, an average of 5,796 jobs were supported by every \$1 billion in U.S. exports.

This evolution in the worldwide economy, and its impact on domestic firms, is forcing U.S. state and metro economic development organizations (EDOs) to reimagine their roles, diversify program offerings, and consider dedicating resources towards new priorities, including international trade. Virginia stands out nationally because it has implemented and maintained innovative international trade programs that are at the forefront of U.S. states and are widely valued and respected by companies. In this regard, Virginia has established a strong platform on which to build a next generation international trade development program.

The objective of this report is to improve the understanding of export activity in Virginia and establish a baseline from which to expand and monitor future international trade efforts. Key findings of this analysis are:

- **Virginia's economy is increasingly tied to exports.** Total state exports reached \$35.9 billion in 2014, an increase of \$12.9 billion, or 56%, since 2003. Export intensity, or the proportion of gross state product (GSP) attributable to direct exports, has increased from 5.6% in 2003 to 7.8% in 2014. From 2009 to 2014, nearly 30% of Virginia's economic growth was driven by exports.
- **Exports contribute significantly to Virginia jobs, income, and taxes.** The estimated direct, indirect, and induced economic impact of Virginia's \$35.9 billion in direct exports in 2014 represented 6.4% of GSP (measured in terms of value added, or total exports minus inputs from other states and countries), 8.5% of total state employment (320,963 jobs), \$18.7 billion in labor income, and \$2 billion in tax revenue. Average income per export-related job was \$58,333.
- **Nearly half of Virginia's exports are in services sectors, a significantly higher share than the U.S. overall.** Virginia is much more services-oriented than the U.S. in the composition of its exports, with services representing 47% of Virginia exports and goods 53%. The composition of U.S. exports is

34% services and 66% goods. After Manufacturing, which remains the state's largest exporting sector, the next largest exporting sectors, in order, are in services: Information & Technology; Education, Medical, & Tourism; and General Business Services. From 2008 to 2014 the three largest sectors also contributed the most to Virginia's export growth.

- **The top seven export subsectors in Virginia each generated over \$1 billion in exports in 2014.** These include Management & Consulting, Meat & Poultry Products, Resins & Synthetic Rubbers, Credit Issuance & Lending, Freight & Port Services, R&D Services, and Computer Services. Subsectors are the more detailed components of sectors. For example, Management & Consulting is a subsector of the General Business Services sector. The top 10 Virginia subsectors represented over 35% of Virginia total exports in 2014.
- **While the majority of exports in Virginia come from the three largest export regions, exports represent a greater share of the local economy in other regions of the state.** Over 60% of Virginia's total exports originate in the Virginia portion of Greater Washington (31.5%), Virginia Beach (15.8%) and Richmond (15%). However, 14 of the remaining 15 regions have higher export intensity (exports as a percentage of GSP) than the three largest regions. In the top four regions for export intensity (Bristol, Harrisonburg, Other Rural Southwest, and Blacksburg), exports represent over 15% of the local economy, compared to 7.8% for Virginia as a whole.
- **Virginia's economy is less export-intensive than the U.S. and comparison states.** Virginia is not as export intensive as the U.S. or comparison states, largely because it is highly dependent on U.S. government spending, is a more services-oriented economy, and is not home to one very large, highly export intensive manufacturing company or industry subsector. Like the U.S. overall, Virginia's economy has become more export intensive over the past decade; however, in 2014 the state's export intensity (7.8%) remained below the U.S. average of 11.6%. The more manufacturing oriented of the comparison states (Kentucky, South Carolina, North Carolina, and Tennessee) have export intensities that are above the U.S. average, while states that are more services oriented (Virginia, Georgia, Pennsylvania, Florida and Maryland) have lower export intensities.
- **Middle market firms represent the greatest opportunity for new export activity that can be assisted by state trade development efforts.** Virginia is home to approximately 6,500 traded sector business establishments in the middle market (20-499 jobs and/or \$10 million to \$1 billion in revenues) offering a large pool of potential exporting firms. The state's international trade programs are already focused on this segment.

Virginia International Trade Profile

Purpose and Approach

The purpose of this report is to provide an improved understanding of Virginia's export activity and the impact of exports on the state economy, and to establish a baseline from which to expand and monitor future international trade efforts. This report highlights dynamics in the global and U.S. economies that make exports an increasingly important component of economic development, clarifies how export activity varies across Virginia's regions and in relation to comparison states, and identifies key export trends across Virginia's industry sectors.

Findings are primarily based on data from the Brookings Institution that for the first time provides estimates for state and regional exports by point of production and for both goods and services exports. Export data from the U.S. Census Bureau, previously the only available source of local export data, provides state and regional data by point of movement out of the U.S., but does not clarify where the goods were actually made and does not provide services data (see appendix for more explanation). Research also included interviews with 18 exporting firms from throughout Virginia and, for the first time, an assessment of the impacts of export activity on economic output, employment, income, and tax revenues.

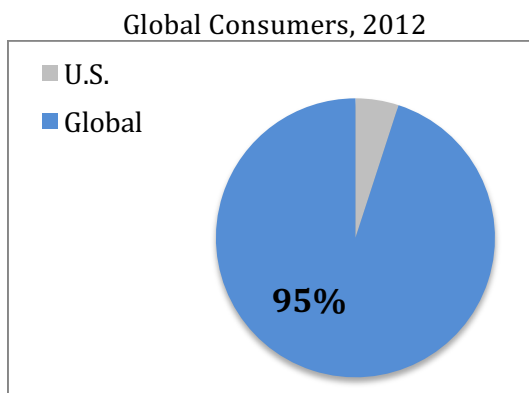
The Virginia Chamber of Commerce Foundation contracted McDearman Associates and the Raymond A. Mason School of Business, College of William & Mary to serve as consultants on this project. The consultants representing McDearman Associates, Brad McDearman and Ryan Donahue, are the individuals who developed and managed the Global Cities Initiative (GCI) Exchange program for the past four years. The GCI Exchange, a joint project of the Brookings Institution and JPMorgan Chase, is a five-year project designed to catalyze change in economic development practice through new research and by collaborating with U.S. metro areas (and their states) to develop global trade and investment plans. Key lessons related to trade from this experience working across the U.S. are shared in this report. Roy L. Pearson, Professor Emeritus, William & Mary, prepared the economic impact analysis. This report captures the key highlights of that impact analysis; however, a more detailed version is available as an addendum to this document.

The Imperative to Go Global

Rapidly changing global dynamics make it imperative that U.S. states and metro areas, and their firms, engage globally as never before. The vast majority of global economic growth over the next several decades is projected to occur outside the United States, driven by expanding middle class populations in the Asia Pacific region and other emerging countries. U.S. exports reached a nationwide record of \$2.35 trillion in 2014, representing over 11.7 million jobs supported by exports (up 1.8 million since 2009). Exports have been a major driver of U.S. economic growth post-recession, accounting for 27% of GDP growth since 2009. While the current slowdown in many global markets impacts near-term U.S. export growth potential, including in Virginia, prospects for international trade remain strong over the longer-term.

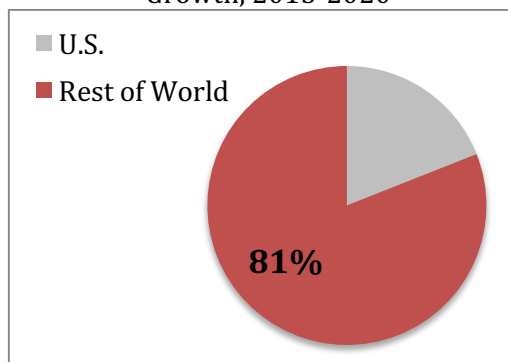
Large, U.S.-based multinationals are keenly aware of these trends and engagement in global markets is part of their everyday business. Small- to mid-size enterprises (SMEs), particularly middle market firms (firms with 20 to 499 employees or \$10 million to \$1 billion in revenues), are increasingly positioned to take advantage of opportunities to grow and maintain competitiveness by selling their products and services to international markets. Beyond tapping new global customers, exports enable companies to weather up and down business cycles in domestic and global markets and to develop new products and services. However, engaging in international markets requires major up-front investments, executive-level acumen, and global connections. Therefore, SMEs often require outside support to begin or expand their international trade efforts.

The bulk of economic growth is occurring outside the U.S.



95% of global consumers live outside of the U.S.

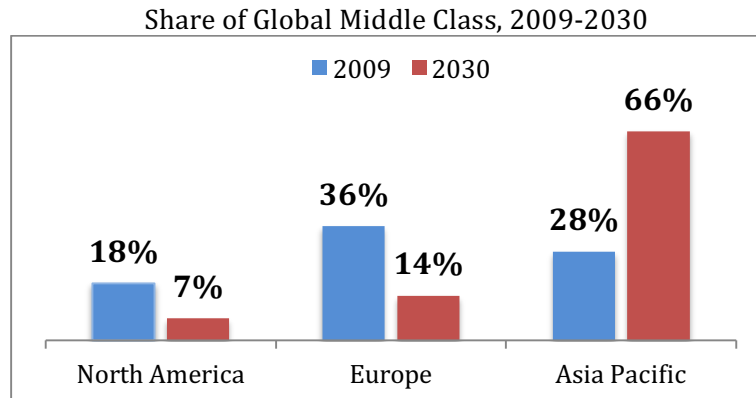
Projected Contribution to Global GDP Growth, 2015-2020



81% of global economic growth is projected to occur outside the U.S. from 2015-2020.

Sources: U.S. Department of Commerce; International Monetary Fund, *World Economic Outlook 2014*.

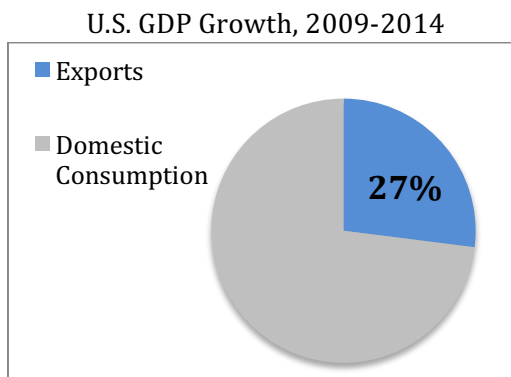
A rising global middle class is shifting growth opportunities to the Asia Pacific region.



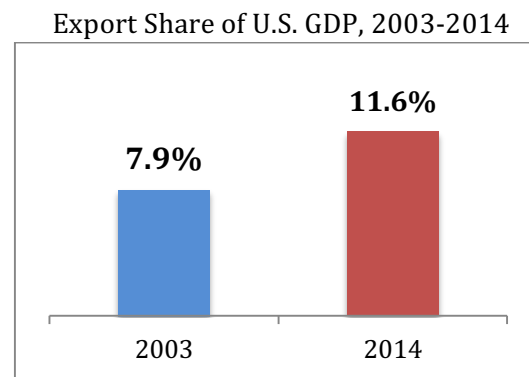
In 2009, North America accounted for 18% of the global middle class, while the Asia Pacific region accounted for 28%. By 2030, the North American share is projected to shrink to 7%, while the Asia Pacific share is projected to grow to 66%.

Source: Homi Kharas and Geoffrey Gertz, "The New Global Middle Class" (Washington: Brookings Institution, 2010).

The U.S. is increasingly export-oriented.



Exports accounted for 27% of U.S. GDP growth post-recession.

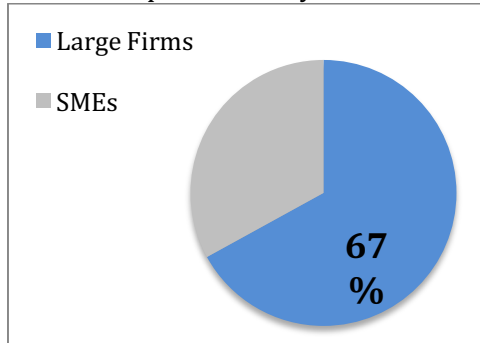


From 2003 to 2014, the export share of U.S. GDP rose from 7.9 % to 11.6%.

Source: Brookings Institution, *Export Monitor* 2015.

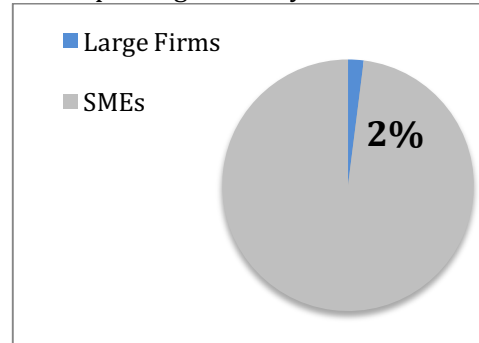
However, large firms dominate U.S. trade activity.

Share of Export Value by Firm Size, 2013



Large firms of 500 or more employees account for **67%** of export value.

U.S. Exporting Firms by Size, 2013



However, large exporters account for **2%** of exporters in the U.S., highlighting the global growth potential of mid-sized firms.

Changing Economic Development

The evolution of the global and domestic economies is forcing U.S. state and metro economic development organizations (EDOs) to reimagine their roles, diversify program offerings, and consider dedicating resources towards new priorities. There are fewer large business attraction projects in the U.S., making it impossible for most states to maintain the pipeline of project activity that defined traditional economic development in previous decades. Further, only a small proportion (1.9%) of new jobs in U.S. states are generated through business relocation from one state to another.

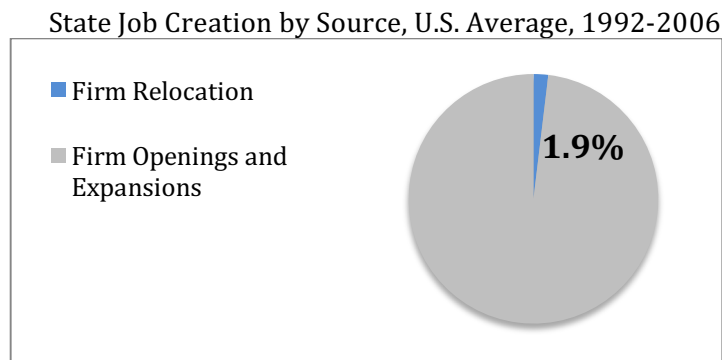
No single data source tracks and provides comparable data, at the national, state, and/or metro area level, on how the pool of business attraction prospects has changed over time. However, a growing set of data and interviews with EDOs and consultants from across the country suggest that the pipeline of large business attraction projects is shrinking and that business relocation is not a major contributor to state job creation.

There is increasing evidence that there are fewer major business attraction projects nationwide.

50% decline in business relocation and expansion projects of 50 jobs+ or \$1 million or more investment, 2000-2012.

Source: Conway Data, Inc.

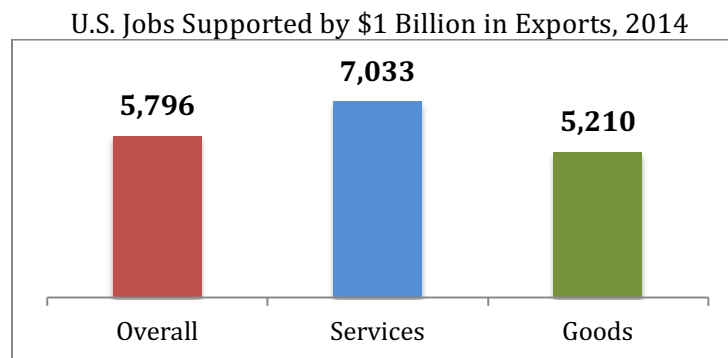
Firm relocation is a minor contributor to job growth in U.S. states.



While it can represent one of many components of a robust economic development program, firm relocation accounts for only 1.9% of state job creation.

Source: Jed Kolko, *"Business Relocations and Homegrown Jobs, 1992-2006"*, 2010.

Exports support local jobs.



\$1 billion in exports supported an estimated 5,796 jobs in 2014. Services sectors are more employment-intensive, as \$1 billion in services exports supports 7,033 jobs while \$1 billion in goods exports supports an estimated 5,210 jobs.

Source: U.S. Department of Commerce International Trade Administration, *"Jobs Supported by Exports 2014: An Update"*, 2015.

Against this backdrop, exports represent a primary economic driver that has received relatively little attention or resources from most U.S. state and metro area EDOs. Firms from across the country interviewed as part of the Global Cities Initiative Exchange, as well as Virginia firms interviewed for this project, stress that exports are critical, not only to maintain and grow jobs, but just as importantly to companies' ability to remain competitive and diversified over the longer-term.

As described in the Brookings document, "10 Lessons from Global Trade and Investment Planning in U.S. Metro Areas", firms are becoming increasingly

intertwined with, and impacted by, the global economy, but most state and local EDOs have not kept pace, hindered by the significant cultural, behavioral, and structural changes required to adapt. Further, while most U.S. state EDOs continue to dedicate, or increase, resources and incentives to business attraction, they have not committed adequate resources to international trade programs to tap into global business opportunities. To gain the full benefits of global markets, and to support existing SMEs in the 21st century economy, global engagement (including international trade), must be a demonstrated economic priority.

The imperative to focus on global markets is perhaps even more critical to the Virginia economy, given anemic economic growth in recent years due to federal government downsizing and sequestration, particularly in defense. One of the primary means by which government contractors– as well as firms in other sectors – can grow will be through diversification of their client base, including developing new clients in foreign markets.

Other key lessons from the Global Cities Initiative Exchange that are highly pertinent to Virginia’s international trade agenda include:

- **The primary benefit is increased competitiveness.** Exports and FDI better position capable firms – and their states – for the long term by allowing them to become more competitive, diversified, and sustainable.
- **The most important firms are the ones you already have.** The foundation of a strong global effort is a heightened focus on the needs of existing firms. Successful international trade programs require EDOs to become experts on their own companies and add value by connecting them with new market opportunities.
- **The middle market is the sweet spot.** Mid-sized firms represent the bulk of potential new global business activity that can be assisted by EDOs. Large multinational firms do not typically require any assistance to go global, while the smallest firms are often simply not ready to export.
- **International trade and FDI are closely linked.** The strong interplay between FDI, exports, and imports means related programs are best implemented in tandem under a global umbrella, even though they require distinct approaches. Imports can lead to FDI as foreign firms switch from importing to producing in, and exporting from, the U.S. International efforts by EDOs converge on the middle market because mid-sized firms are both high-potential exporters and the primary targets of FDI in the form of mergers and acquisitions, which account for more than 80% of FDI into the U.S as measured by capital investment.

Virginia's Response

Virginia has established a strong platform on which to build a next generation international trade program. It is poised to take greater advantage of dynamics in the global economy because, unlike most states, it is not simply reacting to the current trend of export promotion. Virginia stands out in the U.S. because it has made an invested commitment to global trade for over 30 years. The state has implemented and maintained innovative export programs that are widely considered 'best practice' in the United States, that other states seek to replicate, and that local firms find highly valuable.

Most U.S. state and metro area EDOs are now realizing that they must respond to new global economic realities through more intentional global trade programs. However, they are playing catch up at a difficult time. Due to resource constraints, the inability to adapt their current economic development efforts to meet today's realities, a lack of a culture of global trade, and a lack of experienced staff, most states struggle to figure out how to develop and implement an effective international trade program. In this regard, Virginia stands apart from the pack.

Through the Virginia Economic Development Partnership's (VEDP) International Trade division, the state is already focused on most critical aspects of global trade highlighted in Brookings' "10 Lessons" report discussed previously. Virginia has made global trade a demonstrated priority, placed focus on expanding services to support additional firms, and targeted high potential middle market firms for more intense and engaged support. The International Trade division has 17 staff members, including seven regional trade managers with significant international experience, dedicated to exports.

What distinguishes Virginia from other states is that it not only offers the basic set of programs and staff needed to support exporters (which many states claim to offer), but that the programs and staffers are solid, effective, and highly respected by both business clients and other states. The most critical export services are well covered, including Export 101 basic training, market research supported by an established network of trade specialists in over 75 countries, and trade missions. A large number of states have sent representatives to Virginia in an attempt to understand and replicate its programs. Virginia is considered a 'best practice' by the U.S. Small Business Administration for management of its State Trade and Export Promotion (STEP) grant program. In addition, the U.S. Department of Defense has awarded Virginia's trade program over \$5 million in the past three years to support defense contractors entering international markets.

The Virginia Leaders in Exports Trade (VALET) program, Virginia's signature export program established in 2002 as an export accelerator, is one of the programs that positions Virginia at the forefront. This program works intensely with 50 Virginia companies at all times (typically middle market firms with, on average, 111 employees, 25 years in business, and \$36 million in annual sales), with 12 companies entering and 12 graduating every six months. These businesses have

firmly established domestic operations and are accepted into the two-year program based on their commitment to international exporting. On average, companies experience a 54% increase in international sales during their time in VALET.

The level of praise from Virginia firms for the VALET program and Virginia's overall international trade programs is unparalleled when compared with U.S. state and metro areas that have been involved in the Global Cities Initiative Exchange (see example quotes from interviews with Virginia businesses below). In no state has the feedback from business leaders involved with state export programs been as uniformly positive as in Virginia.

One of the reasons that the VALET program is so successful is that Virginia has placed intensive focus on serving middle market firms, which as noted previously represent the greatest potential for export growth that can be assisted by EDOs. Further, firms enter the program through a selective application process that better ensures they are prepared to successfully expand export markets. Within Virginia there are over 6,700 mid-size business establishments in traded sectors (sectors that produce goods and services that are, or could be, traded internationally), providing a healthy pool of current and potential exporters.

Virginia has a healthy pool of 6,700 current and potential mid-sized exporters.

Virginia Mid-Sized Establishments in Traded Sectors, 2013		
Establishment Size	Number of Establishments	Share of Mid-Sized Total
20 to 49 employees	3,830	57%
50 to 99 employees	1,522	23%
100 to 249 employees	1,005	15%
250 to 499 employees	395	6%
Total	6,752	

Through the recently announced Virginia International Trade Alliance (VITAL) initiative, Virginia seeks to expand its outreach to these firms. VITAL aims to double the number of companies that Virginia works with and create \$1.6 billion in additional export sales and 14,000 trade-supported jobs over five years. This initiative involves formal partnerships with Virginia's public universities, industry associations, and the Virginia Chamber of Commerce to serve their member companies as they expand international sales.

Representative quotes from Virginia companies interviewed for this project.

“A lot of companies don’t think it is feasible to export. They need more help to understand the potential and take them through the process.”

“From what I’ve seen, what the state of Virginia is doing is head and shoulders above what any state is doing. Virginia definitely has a program to model.”

“What Virginia is doing on exports is an incredibly important role for the state to play. They got us to the point where we are capable and have networks and connections.”

“Virginia is probably the best of any state that provides exports services. Our ownership group was against government involvement with our business, but we’ve learned that government is critical to our export efforts. “

“Working through VALET has put us in front of people we absolutely would not have been able to meet. We have gotten a lot out of it.”

“In our experience, Virginia is very well connected in the geographies that we are interested in. We were a much smaller player when we started with them.”

“Being affiliated with a government trade mission gave us a seal of approval. We can secure the right business meetings and skip a few steps in the trust building process.”

“It’s actually really frustrating that we have picked Virginia, but are told that the Governor’s opportunity fund is only for recruiting new companies. The economy has changed but policies around incentives have not.”

“Virginia companies can’t just sell to government anymore. We must learn to do things differently.”

“The VALET program staff got to know us and what we do. Even though we have graduated from the program they are constantly emailing and letting us know of new opportunities for relevant grants, conferences and other support.”

In Virginia, as in any other state, the quality of international trade programs is not the sole determinant of overall export volumes. The data presented in the remainder of this report, therefore, is not intended to assess Virginia’s programs, but rather to establish the contribution of exports to Virginia’s economy and to provide insight on export trends that may guide future efforts.

Virginia Export Performance

The Role of Exports in Virginia's Economy

The Brookings data used in this report is only available for the period from 2003 to 2014. Three time periods are employed in this analysis. The primary focus is on the 2008 to 2014 period, which captures trends that begin with the 2008 pre-recession export peak. The full 2003 to 2014 period is used in certain cases to reveal long-term trends. The 2009 to 2014 period is also used in certain cases to describe the contribution of exports to the post-recession recovery, starting with the 2009 low point.

Exports are an increasingly important driver of Virginia's economy. Total state exports reached \$35.9 billion in 2014, an increase of \$12.9 billion, or 56%, since 2003. Export intensity, or the proportion of gross state product (GSP) attributable to exports, has increased from 5.6% in 2003, to 7% in 2008, and to 7.8% in 2014.

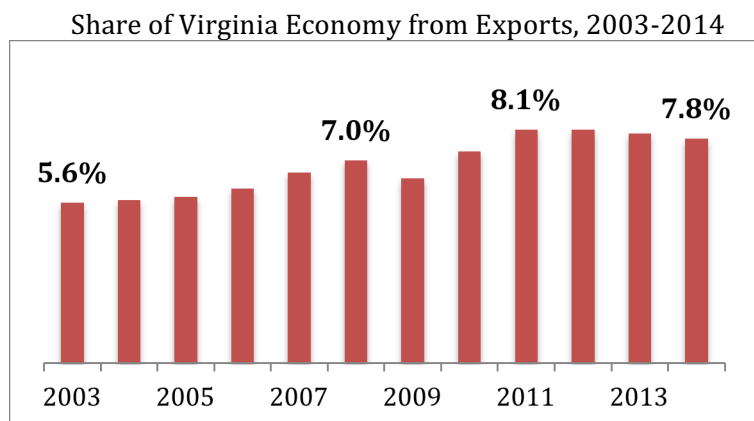
Exports represent a bright spot for Virginia's economy, which has experienced somewhat anemic economic growth during the post-recession years. Exports drove nearly 30% of the state's economic growth from 2009 to 2014, playing a larger role in Virginia's post-recession recovery than in the U.S. overall. From their pre-recession peak in 2008, exports grew at 2.4 times the rate of the state's economy overall through 2014.

Virginia total exports were nearly \$36 billion in 2014.

Total Exports, 2003	Total Exports, 2014
\$22.9 billion	\$35.9 billion
Increase: \$12.9 billion or 56%	

Source: Brookings Institution, Export Monitor 2015.

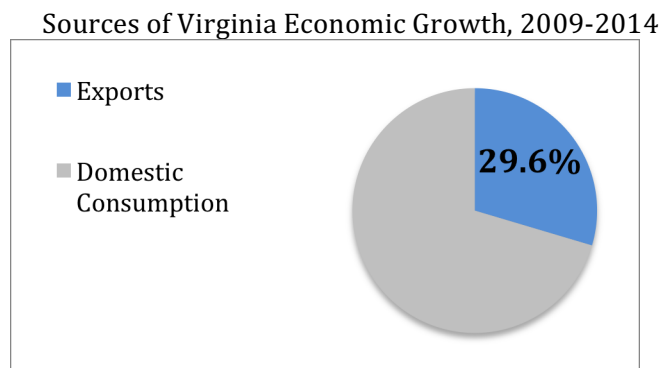
Virginia's economy is increasingly export-oriented.



7.8% of Virginia's economy is from exports, up from 5.6% in 2003 and down slightly from a post-recession peak of 8.1% in 2011.

Source: Brookings Institution, Export Monitor 2015.

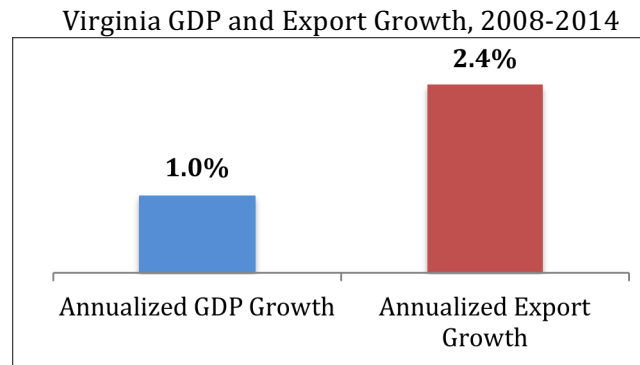
Exports have driven a significant share of Virginia's economic growth since the low point of the recession in 2009.



From 2009 to 2014, nearly 30% of economic growth in Virginia was driven by exports.

Source: Brookings Institution, Export Monitor 2015.

Virginia export growth was 2.4 times greater than GSP growth from 2008 to 2014.



Exports grew at 2.4 times the rate of the state economy from 2008 to 2014.

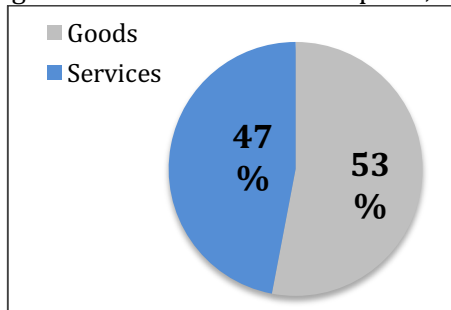
Source: Brookings Institution, Export Monitor 2015.

Services Orientation of Virginia's Exports

Virginia is much more services-oriented than the U.S. in the composition of its exports, with services representing 47% of Virginia exports and goods 53%. The U.S. average is 34% services and 66% goods. Goods represent Manufacturing, Agriculture, and Mining (tangible products), and services represent a range of subsectors, such as Business Services, Architecture & Engineering, and Education, Medical & Tourism services. The goods-services breakdown is important to understand because the most export-intensive states are driven by larger, export-oriented manufacturing and mining (including petroleum) sectors. Services exports are difficult to estimate and are likely under-counted. However, services sectors and their exports are high potential contributors to future economic growth.

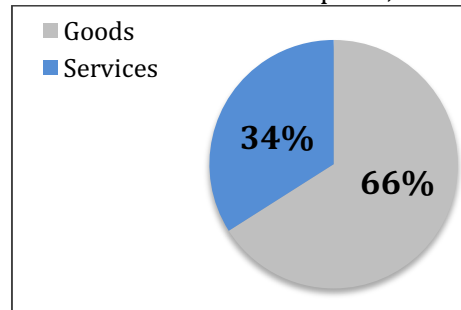
Nearly half of Virginia's exports are in services, a significantly higher share than the U.S. overall.

Virginia Goods and Services Exports, 2014



47% of Virginia exports are from services-producing industries.

U.S. Goods and Services Exports, 2014



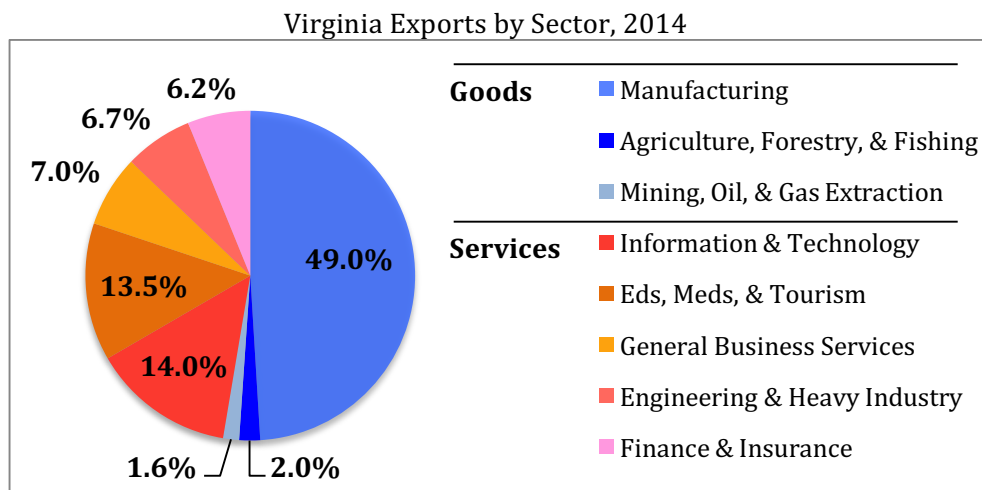
34% of U.S. exports are from services-producing industries.

Source: Brookings Institution, Export Monitor 2015.

Virginia Exports by Sector (High Level)

While Virginia is more services oriented than the U.S., Manufacturing is still Virginia's largest sector, accounting for almost half of overall exports in the state. The service sectors of Information & Technology and Education, Medical, & Tourism are the two next highest sectors, together representing over 25% of state exports. The Manufacturing and Information & Technology sectors together grew by \$2.5 billion from 2008 to 2014, representing over 50% of Virginia's total export growth during that period. At the other end of the spectrum, Mining, Oil, & Gas Extraction contracted over this period while Agriculture, Forestry & Fishing was stagnant. In terms of average annual growth rate from 2008 to 2014, Finance & Insurance led at nearly 8%. Manufacturing, despite contributing the most to absolute growth, only expanded at 1.5% annually.

Virginia is more services oriented than the U.S., but Manufacturing still plays an important role in export production, accounting for 49% of Virginia exports.

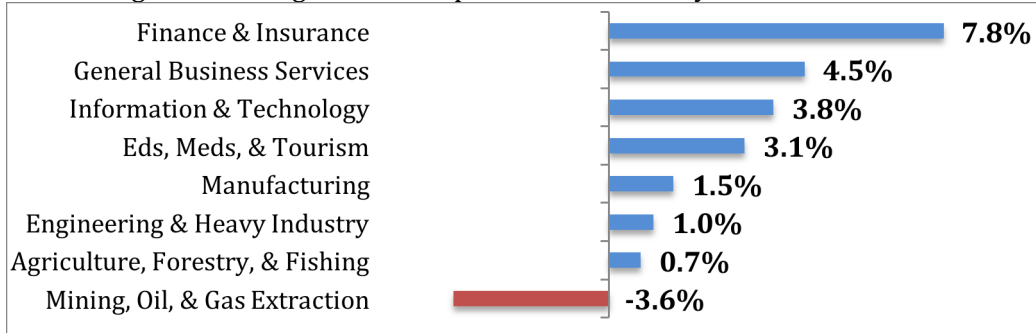


49% of Virginia's export value is from Manufacturing, followed by Information & Technology and Ed, Meds, & Tourism, which together account for 28% of Virginia's export value.

Source: Brookings Institution, *Export Monitor* 2015.

Finance & Insurance led on annual growth rate, while Manufacturing grew relatively slowly despite contributing the most to absolute growth.

Virginia's Average Annual Export Growth Rate by Sector, 2008-2014

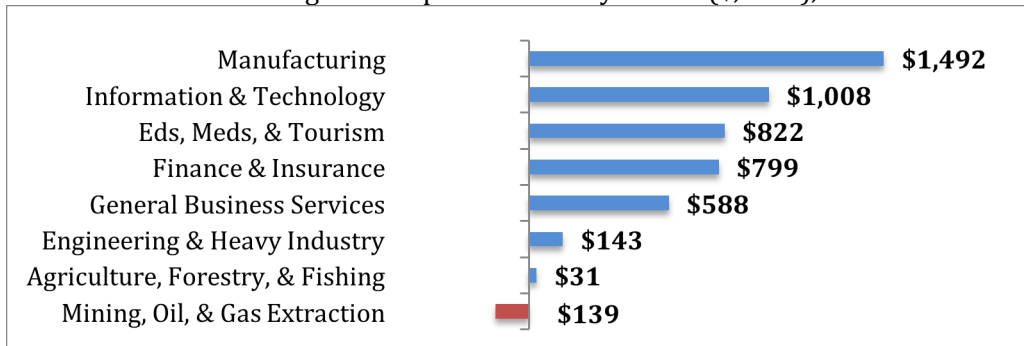


Finance & Insurance ranked fourth in absolute export growth from 2008 to 2014, but was the fastest growing sector during that period with average annual export growth of 7.8%. Manufacturing was the fifth fastest growing, at just 1.5% annually.

Source: Brookings Institution, *Export Monitor* 2015.

Manufacturing and Information & Technology contributed the most to absolute growth from 2008 to 2014.

Contribution to Virginia's Export Growth by Sector (\$, Mill.), 2008-2014



Manufacturing and Information & Technology accounted for \$2.5 billion in export growth, over 50% of Virginia's total, from 2008 to 2014. Agriculture, Forestry, & Fishing and Mining, Oil, & Gas Extraction were stagnant to declining.

Source: Brookings Institution, *Export Monitor* 2015.

Virginia Exports by Subsector (Detailed)

Seven Virginia subsectors (4-digit NAICS level) generated more than \$1 billion in exports in 2014, of which five were in services. Leading subsectors for total exports include Management & Consulting, Meat & Poultry Products, Resins & Synthetic Rubbers, Credit Issuance & Lending, Freight & Port Services, R&D Services, and Computer Services. Together, the top 10 subsectors represented over 35% of Virginia's total exports in 2014.

35% of Virginia exports are generated within the top 10 exporting subsectors.

Largest Export Subsectors in Virginia, 2014				
Rank	NAICS Codes	NAICS Subsector	Real Exports (\$, Mill.)	Share of Virginia Exports
1	5416; 5611	Management & Consulting	1,925	5.4%
2	3116	Meat & Poultry Products	1,889	5.3%
3	3252	Resins & Synthetic Rubbers	1,537	4.3%
4	5222; 5223	Credit Issuance & Lending	1,342	3.7%
5	481-484; 488	Freight & Port Services	1,176	3.3%
6	5417	R & D Services	1,163	3.2%
7	5415	Computer Services	1,021	2.8%
8	511; 517; 519	Information Tech. Royalties	922	2.6%
9	481; 4881	Air Transportation Services	876	2.4%
10	3361	Motor Vehicles	874	2.4%
Total for top 10			12,727	35.5%

Source: Brookings Institution, Export Monitor 2015.

Six of the 10 largest export subsectors are also among the 10 subsectors in Virginia with the largest absolute growth from 2008 to 2014. These six subsectors include Credit Issuance & Lending, Meat & Poultry Products, R&D Services, Management & Consulting, Computer Services, and Air Transportation Services. Three of the 10 fastest growing subsectors (Meat & Poultry Products; Snack, Coffee, & Condiments; and Beverage Products) are in the food and beverage sector.

Six of Virginia's largest exporting subsectors also experienced the most growth.

Virginia's Fastest Growing Exporting Subsectors, 2008-2014				
Rank	NAICS Code	NAICS Subsector	Export Growth (\$, Mill.)	Share of Virginia Exports
1	5222; 5223	Credit Issuance & Lending	714	3.7%
2	3116	Meat & Poultry Products	570	5.3%
3	5417	R & D Services	470	3.2%
4	5416; 5611	Management & Consulting	375	5.4%
5	3119	Snack, Coffee, & Condiments	352	2.1%
6	3121	Beverage Products	269	1.3%
7	5415	Computer Services	217	2.8%
8	481; 4881	Air Transportation Services	206	2.4%
9	722	Food & Drink Services	172	2.3%
10	31-33	Other Manufacturing Royalties	170	1.1%
Total top 10			3,515	29.8%

In 12 subsectors, Virginia is among the top five states nationally for export production. (Some of these subsector export figures do not align closely with Census export data; for a comparison of the two data sources, see the appendix.) Most of these subsectors are relatively small, with only three (Meat & Poultry Products, Computer Services, and Snack, Coffee, and Condiments) representing more than 2% of Virginia's total exports in 2014.

Virginia ranks in the top five nationally for export production in 12 subsectors.

Virginia Subsectors Ranked in the Top 5 Nationally for Exports, 2014				
National Rank in Subsector	NAICS Code	NAICS Subsector	Real Exports (\$, Mill.)	Industry Share of VA Exports
1	3366	Ships & Boats	656	1.8%
2	3141	Household Textile Products	95	0.3%
2	3122	Tobacco Products	148	0.4%
3	3116	Meat & Poultry Products	1,889	5.3%
3	5415	Computer Services	1,021	2.8%
3	3119	Snack, Coffee, & Condiments	752	2.1%
3	3117	Seafood Products	48	0.1%
4	3121	Beverage Products	477	1.3%
4	3132	Fabrics	431	1.2%
4	3113	Sugar & Confectionery Products	160	0.4%
5	2121	Coal Mining	469	1.3%
5	3131	Fiber, Yarn, & Thread Products	97	0.3%
Total for 12 subsectors			6,244	17.4%

Source: Brookings Institution, Export Monitor 2015.

Economic Impact of Virginia's Exports

Export impacts, based on original data from Brookings, were prepared by Roy L. Pearson, Professor Emeritus, Raymond A. Mason School of Business, at the College of William & Mary and are reported here by five measures:

1. Output (the dollar receipts from foreign customers for Virginia goods and services);
2. Value added (the local portion of production within Virginia's borders – the Virginia Gross State Product);
3. Labor income (compensation including benefits, and proprietor's income);
4. Number of employees (full-time and part-time);
5. Tax revenues (state and local).

For all five measures, the total economic impact is the sum of three types of impacts: direct, indirect, and induced. A detailed explanation of each type can be found in the full impact report, *Virginia Export Production Impacts*, in the addendum.

The estimated economic impact of the \$35.9 billion in Virginia exports sold directly to foreign residents in 2014, including indirect and induced impacts, was \$57.1 billion. However, the products sold included materials produced in other states, or even the rest of the world. The Virginia-made portion of the sales, the value added, totaled \$29.7 billion, comprising 6.4% of Virginia's total 2014 Gross State Product (GSP) of \$463.6 billion. The major component of value added is labor income, a total of \$18.7 billion directly and indirectly earned by Virginia workers in producing goods and services for export. This 2014 export production supported an estimated 320,963 jobs at an average income per job of \$58,333.

Virginia's Goods and Services Export Production Impacts, 2014					
Impact Type	Output (\$ Mill.)	Value Added (GSP) (\$ Mill.)	Labor Income (\$ Mill.)	Employment	Income per Job
Direct	\$35,856	\$16,960	\$11,197	169,670	\$65,992
Indirect	\$10,855	\$6,140	\$3,866	71,092	\$54,378
Induced	\$10,395	\$6,551	\$3,660	80,201	\$45,635
Total	\$57,106	\$29,652	\$18,723	320,963	\$58,333
Share of Virginia Total		6.4%		8.5%	

Economic Impact of Virginia's Goods Export Production

The estimated direct economic impact of goods sold to foreign residents was \$18.9 billion (53% of total exports) in 2014, and the total impact (including indirect and induced impacts) is \$28.5 billion. The companies selling these goods only internally produced \$6.2 billion of the goods value, the direct value-added, because much of the materials and most of the energy used came from other businesses. The actual

Virginia production was \$11.6 billion, accounting for 2.5% of Virginia's GSP, with \$6.3 billion in labor income earned by an estimated 110,957 employees.

Virginia's Goods Export Production Impacts, 2014					
Impact Type	Output (\$ Mill.)	Value Added (GSP) (\$ Mill.)	Labor Income (\$ Mill.)	Employment	Income per Job
Direct	\$18,878	\$6,198	\$3,108	45,978	\$67,601
Indirect	\$6,143	\$3,161	\$1,943	38,064	\$51,043
Induced	\$3,489	\$2,199	\$1,228	26,915	\$45,639
Total	\$28,511	\$11,558	\$6,279	110,957	\$56,593
Share of Virginia Total		2.5%		2.9%	

Economic Impact of Virginia's Services Export Production

Services exports have different impacts than goods. The nearly \$17 billion received for services to foreign residents was 47% of total Virginia exports. However, \$10.8 billion of the total was direct Virginia GSP, with \$8.1 billion of it paid to labor. Services are very labor-intensive and provided by people in Virginia, with less in material purchases from other businesses, so much more of the direct production is value-added within the state. The cumulative effect was about the same services output as goods output, but the services export sales created total Virginia GSP of \$18.1 billion, equal to 3.9% of the total, and 57% more than the \$11.6 billion value added for goods exports. Services exports resulted in \$12.4 billion in labor income, 210,006 jobs, and income per job of \$59,252.

Virginia's Services Export Production Impacts, 2014					
Impact Type	Output (\$ Mill.)	Value Added (GSP) (\$ Mill.)	Labor Income (\$ Mill.)	Employment	Income per Job
Direct	\$16,978	\$10,762	\$8,089	123,692	\$65,394
Indirect	\$4,712	\$2,980	\$1,923	33,028	\$58,222
Induced	\$6,906	\$4,352	\$2,432	53,286	\$45,633
Total	\$28,596	\$18,094	\$12,443	210,006	\$59,252
Share of Virginia Total		3.9%		5.6%	

Economic Impact of Virginia's Major Export-Related Taxes

Virginia goods and services export production is estimated to have contributed state and local tax revenues of at least \$2.0 billion in calendar year 2014. The 2014 export-related output sales of \$57.1 billion, generating \$29.7 billion in Virginia GSP and labor income of \$18.7 billion, created substantial Virginia state and local tax payments. A full explanation of the methodology can be found in the full impact report, *Virginia Export Production Impacts*, in the addendum.

Sales tax revenues are greater than income tax revenues. This is to be expected since much of export-related spending is subject to sales taxes. The motor vehicle license revenue includes estimates for business as well as individual licenses. The miscellaneous category includes a wide range of business licenses and taxes such as the severance tax.

Virginia's Export-Related Taxes, 2014	
Tax Categories	\$ Mill.
State & Local Sales Taxes	\$587
Property Tax	\$777
Individual Income Taxes	\$427
Corporate Income Taxes	\$57
Motor Vehicle Licenses	\$34
Misc. State & Local Taxes	\$124
Total State and Local Taxes	\$2,007

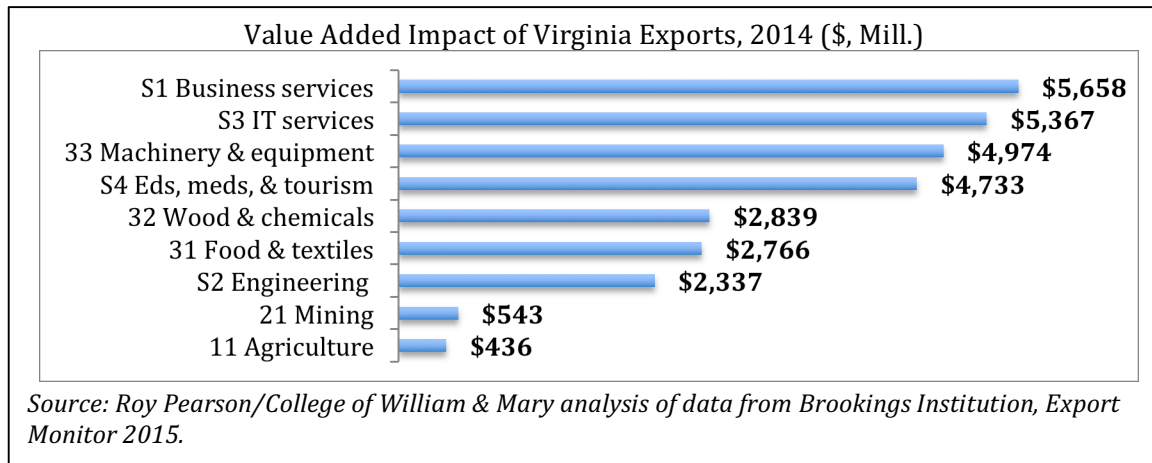
Economic Impacts of Virginia's Exports by Sector

Economic impacts were also produced for nine Virginia sector groupings (see the box below). The five goods sectors are represented by 2-digit NAICS codes. Services are represented by four sector groupings.

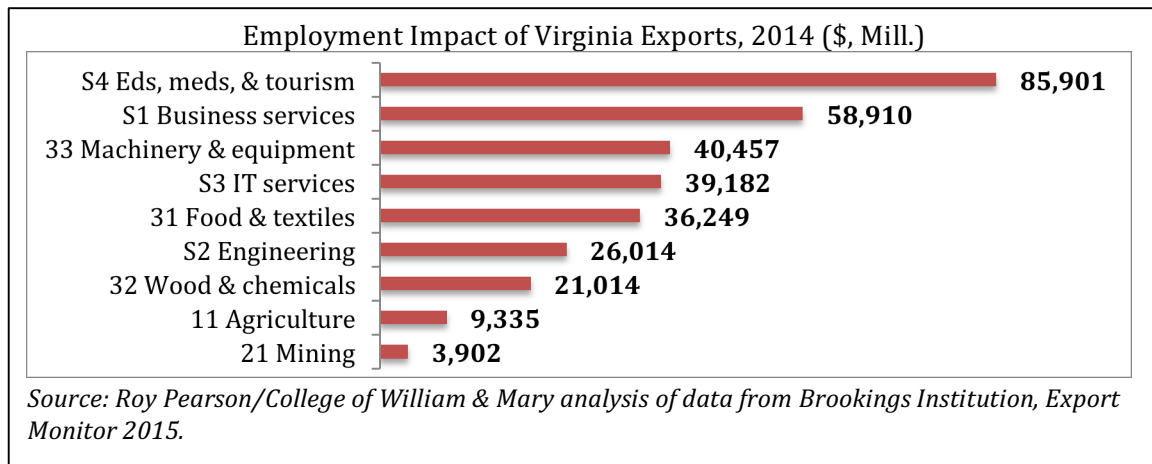
Sector Groupings for Economic Impact Analysis
11 Agriculture, forestry and fishing
21 Metal ore & mineral mining products
31 Food, beverage, textiles, apparel
32 Wood, paper, chemical, plastics
33 Metal, machinery, electrical, transportation, furniture
S1 Finance, insurance, general business services
S2 Engineering & heavy industry support services
S3 Information & technology services
S4 Education, medical & tourism services

Exports in the General Business Services and Information & Technology services sectors had the greatest overall economic impact on the Virginia economy in 2014, placing among the top half of the nine sector groupings for value added, employment, and income per job. Machinery & Equipment Manufacturing (NAICS 33) exports also provide significant impact on Virginia's economy, placing third in both value added and employment, and also having relatively high wages. Agriculture places near the bottom in all three measures; however, this may not capture the full contribution of agriculture to Virginia exports, as some might be attributed to processed goods captured in NAICS sectors 31 and 32 (which include processed food and wood products). Mining is also at or near the bottom for value added and employment; however, its relatively small employment base earns the highest average income among the sectors.

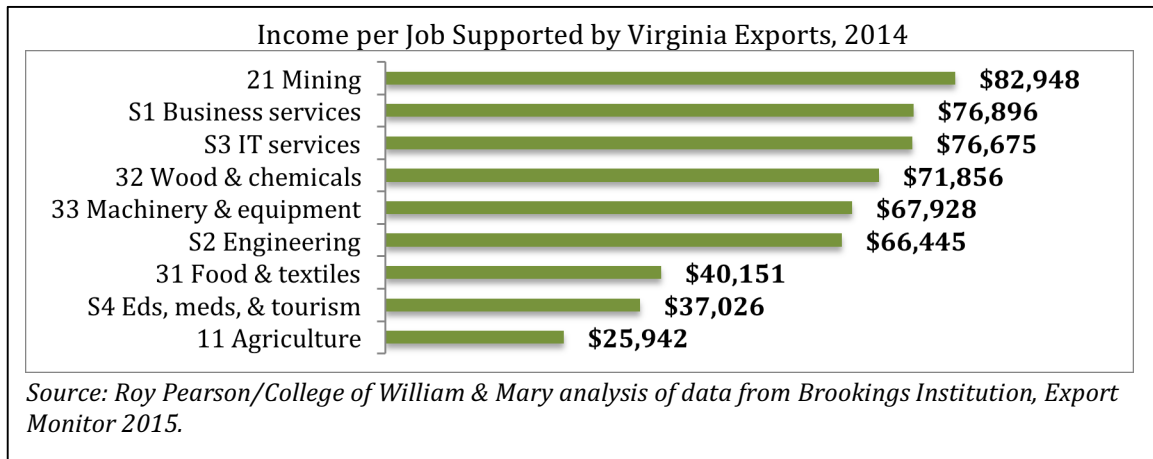
The sectors that provide the greatest impact on value added to Virginia GSP from exports are General Business Services, Information & Technology services, and Machinery & Equipment Manufacturing. Agriculture and Mining sectors trail the group with value added that is less than 10% of that for first place General Business Services.



The greatest employment impacts due to exports are attributable to the Education, Medical, & Tourism sector with direct, indirect and induced employment of over 85,000 jobs. General Business Services (58,910), and Machinery & Equipment Manufacturing (40,457), and Information & Technology services (39,182) round out the top four. Mining (3,902) and Agriculture (9,335) generate the lowest employment impacts due to exports.



The greatest impact on income per job due to exports is in Mining (\$82,948), General Business Services (\$76,896), and Information & Technology Services (\$76,896). While Mining has the highest income per job, this is based on direct, indirect, and induced labor income from just 1,629 direct jobs. Agriculture (\$25,942) and Education, Medical & Tourism (\$37,026) sectors have the lowest income per job.



Exports Across Virginia's 18 Sub-State Regions

Over 60% of Virginia's exports originate in the three largest export regions of the state. The Virginia portion of Greater Washington has the largest share of state exports at 31.5%. Virginia Beach (15.8%) and Richmond (15%) round out the top three. The state share of exports in the remaining regions is between 0.7% and 4.3%.

62% of Virginia's exports and 70% of direct export jobs are generated in the Washington DC, Virginia Beach, and Richmond regions.

Exports by Virginia Region, 2014				
Rank	Region	Share of State Exports	Share of Direct Export - Supported Jobs	Share of State GDP
1	VA portion of Washington DC	31.5%	42.0%	39.5%
2	Virginia Beach	15.8%	15.2%	19.7%
3	Richmond	15.0%	12.3%	15.5%
Total: 3 largest regions		62.2%	69.5%	74.7%
4	Roanoke	4.3%	3.9%	3.8%
5	Other Rural Southwest	4.2%	3.1%	2.2%
6	Harrisonburg	3.8%	2.8%	1.9%
7	Blacksburg	3.6%	2.7%	1.8%
8	Lynchburg	3.6%	2.9%	2.4%
9	Other Rural Northwest	3.1%	2.4%	1.8%
10	Other Rural Northeast	2.3%	1.7%	1.7%
11	Staunton	2.2%	1.8%	1.2%
12	Charlottesville	2.0%	2.3%	2.7%
13	Other Rural Southside	2.0%	1.8%	1.6%
14	VA portion of Bristol	1.8%	1.4%	0.8%
15	Winchester	1.6%	1.2%	1.3%
16	Danville	1.4%	1.1%	0.9%
17	Martinsville	1.0%	0.9%	0.6%
18	Big Stone Gap	0.7%	0.5%	0.6%

Source: RM Donahue analysis of data from Brookings Institution, Export Monitor 2015.

While the bulk of overall exports originate from the three largest regions in the state, exports actually represent a greater share of the local economies in 14 of the remaining 15 regions. In the top four regions, (Bristol, Harrisonburg, Other Rural Southwest, and Blacksburg) exports represent over 15% of the total local economy.

In the Virginia sub-state regions outside of the largest metro areas, exports represent a greater share of the local economy.

Export Intensity by Virginia Region, 2014		
Rank	Region	Export Share of GDP
1	VA portion of Bristol	17.2%
2	Harrisonburg	15.4%
3	Other Rural Southwest	15.3%
4	Blacksburg	15.2%
5	Staunton	14.1%
6	Other Rural Northwest	13.2%
7	Martinsville	13.2%
8	Danville	13.0%
9	Lynchburg	11.6%
10	Other Rural Northeast	10.6%
11	Other Rural Southside	9.9%
12	Big Stone Gap	9.3%
13	Winchester	9.3%
14	Roanoke	8.9%
Virginia state average		7.8%
15	Richmond	7.5%
16	Virginia Beach	6.2%
17	VA portion of Washington DC	6.2%
18	Charlottesville	5.9%

Source: RM Donahue analysis of data from Brookings Institution, Export Monitor 2015.

Many regions have distinct export specializations, with one sector representing over 10% of total exports in 13 of 18 regions. In only two regions – the Virginia portion of the Washington DC metro area and Charlottesville – is the top sector a services sector.

In many regions, the top export sector accounts for over \$100 million in annual exports and more than 10% of the regional total.

Top Export Sectors by Virginia Region, 2014					
Region	NAICS Code	Sector Name	Region Exports (\$ Mill.)	Sector Share of Region Exports	
VA portion of Washington DC	14SV	Management & Consulting	1,478	13.1%	
Richmond	3252	Resins & Synthetic Rubbers	894	16.7%	
Harrisonburg	3116	Meat & Poultry Products	648	47.6%	
Virginia Beach	3366	Ships & Boats	611	10.8%	
Other Rural Northeast	3116	Meat & Poultry Products	280	34.2%	
Other Rural Southwest	3361	Motor Vehicles	249	16.4%	
Other Rural Northwest	3116	Meat & Poultry Products	200	18.0%	
Staunton	3132	Fabrics	150	19.3%	
Blacksburg, Christiansburg, Radford	3353	Electrical Equipment	141	10.9%	
Big Stone Gap	2121	Coal Mining	138	56.1%	
Roanoke	3353	Electrical Equipment	121	7.8%	
Lynchburg	3339	Misc. Gen. Purpose Machinery Ag., Constr., Mining	113	8.8%	
VA portion of Bristol	3331	Machinery	97	14.8%	
Winchester	3261	Plastics	90	15.6%	
Charlottesville	04SV	Educational Services	88	12.2%	
Other Rural Southside	3132	Fabrics	55	7.7%	
Danville	3262	Rubber Products	41	7.9%	
Martinsville	3252	Resins & Synthetic Rubbers	26	6.9%	

Source: RM Donahue analysis of data from Brookings Institution, Export Monitor 2015.

Virginia is home to over 6,700 middle market business establishments in traded sectors, which represent the primary targets for new export activity and support. Of these, almost 50% are in the Virginia portion of the Washington, DC metro area and most of these are in services sectors. The three largest regions are home to 78% of the state total and also have a high concentration in services. The approximately 1,500 remaining establishments are spread throughout the other 15 regions, with manufacturing establishments representing a much larger share of the total in these regions.

Nearly 80% of Virginia's mid-sized traded sector establishments are in three regions; many others have a smaller, more manufacturing-oriented pool.

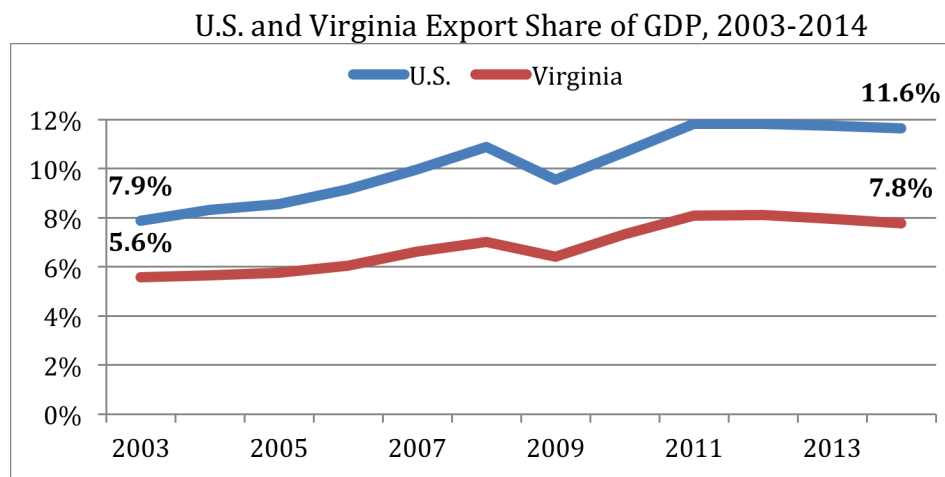
Mid-Sized Traded Sector Establishments, by Virginia Region			
Region	Mid-Sized Traded Sector Establishments	Share of State Total	Share in Manufacturing
VA portion of Washington DC	3,343	49.5%	6%
Virginia Beach	1,026	15.2%	22%
Richmond	898	13.3%	25%
Total in top three regions	5,267	78%	13%
Roanoke	248	3.7%	41%
Lynchburg	162	2.4%	57%
Charlottesville	151	2.2%	25%
Other Rural Southwest	129	1.9%	73%
Blacksburg, Christiansburg, Radford	100	1.5%	46%
Other Rural Northwest	94	1.4%	73%
Other Rural Southside	89	1.3%	75%
Other Rural Northeast	88	1.3%	39%
Winchester	80	1.2%	59%
Staunton	78	1.2%	58%
Harrisonburg	70	1.0%	53%
Danville	63	0.9%	52%
VA portion of Bristol	59	0.9%	8%
Martinsville	49	0.7%	73%
Big Stone Gap	25	0.4%	28%
Total	6,752		

Source: U.S. Census Bureau, County Business Patterns.

Virginia's Exports in Comparison to Other States and the U.S.

This section examines how Virginia compares to eight other states and the U.S. overall on a set of basic, high level export indicators. Virginia is not as export intensive (exports as a percentage of GSP) as the U.S. or many comparison states, largely because it is highly dependent on U.S. government spending, is a more services-oriented economy, and is not home to one very large, highly export intensive manufacturing company or industry sub-sector. Most states that are highly export intensive are driven by one key industry (or even firm), such as aerospace (led by Boeing) and software (led by Microsoft) in Washington state, computer and electronics (led by Intel) in Oregon, or petroleum in Louisiana, or they have a high concentration of firms in manufacturing, such as in Indiana. Like the U.S. overall, Virginia's economy has become more export intensive over the past decade, rising from 5.6% in 2003 to 7.8% in 2014. However, the state remains below the 2014 U.S. average of 11.6%.

Virginia's economy is not as export intensive as the U.S. overall.



Virginia's export intensity has remained below the U.S., but exhibits similar growth patterns. Virginia's export intensity was 5.6% in 2003, grew to a post-recession peak of 8.1% in 2011 and fell slightly to 7.8% in 2013.

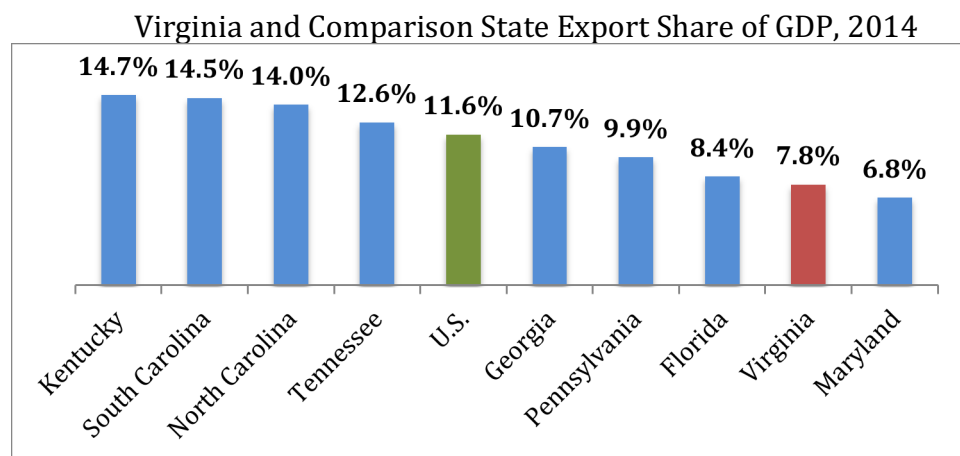
Source: Brookings Institution, *Export Monitor* 2015.

Many states that are widely regarded as having the best international trade development programs (such as Virginia, Florida, and Pennsylvania) do not necessarily have the highest levels of export intensity currently. Since export intensity is dependent on exports from large multinational firms (typically in manufacturing), state EDOs have very little influence over this indicator, especially in the near term. The segment where state international trade development programs can have the greatest impact revolves around middle market firms, including programs that can increase the number of firms that export and the number of new markets for current exporters. As these firms grow larger over time,

and a culture of international trade is established, the potential for higher overall export intensity in the state economy should increase.

Comparison states were chosen based on a mix of factors, including being neighboring states, having a reputation for strong export services programs, and having an above average services orientation. The more manufacturing intensive states (Kentucky, South Carolina, North Carolina, and Tennessee) have export intensities that are above the U.S. average, while states that are more services oriented (Georgia, Pennsylvania, Florida, Virginia and Maryland) have lower intensities.

Manufacturing oriented states tend to have higher export intensities, while services oriented states tend to have lower export intensities.

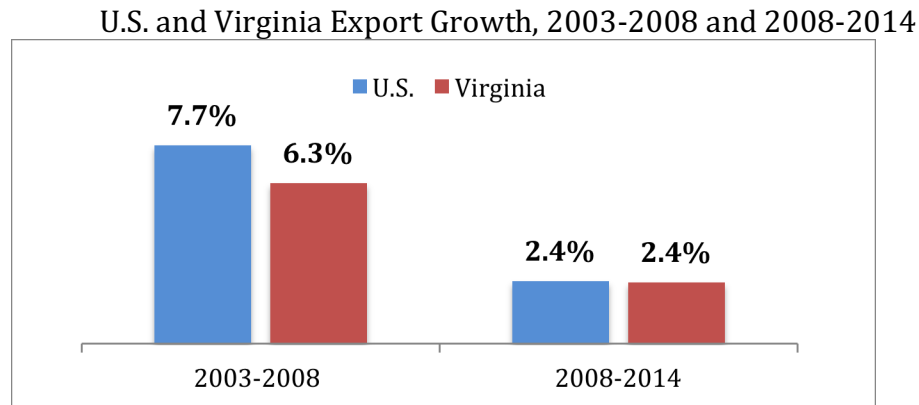


Virginia's export intensity is lower than a set of comparison states, most of which are significantly more manufacturing-oriented than Virginia (the average goods share of state exports in the top four states by export intensity in the above chart, is 81 percent, compared to 53 percent for Virginia).

Source: Brookings Institution, Export Monitor 2015.

From 2003 to 2008, Virginia's export growth of 6.3% was slower than the U.S. average (7.7%), even though the state's annual GSP growth (2.5%) during this period was slightly higher than the U.S. average (2.3%). However, from 2008 to 2014, the state's annual export growth of 2.4% matched that of the U.S. even though its annual GSP growth was lower than the U.S.

Virginia's export growth lagged the U.S. from 2003-08; however, the state performed at the U.S. average from 2008-14.

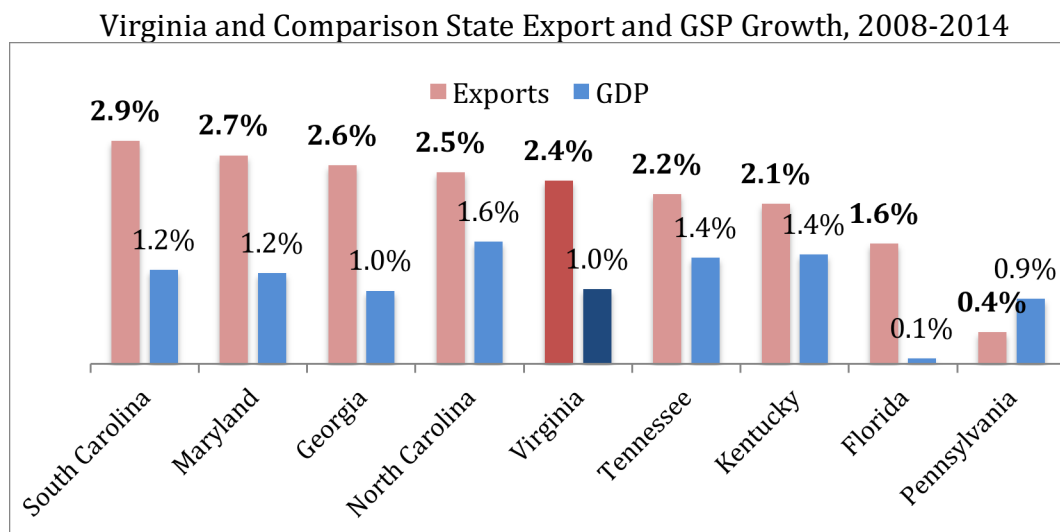


Like the U.S. as a whole, Virginia's export growth from 2008 to 2014 is significantly lower than from 2003 to 2008 (in part due to the effects of the recession from 2008 to 2009). However, from 2008 to 2014 Virginia's export growth matched the U.S.

Source: Brookings Institution, Export Monitor 2015.

From 2008 to 2014, export growth surpassed GDP growth in most states. The states with the largest GDP growth tended to be the states whose exports also grew fastest.

Export growth surpassed GSP growth in Virginia and most comparison states.



Virginia's annual export growth rate of 2.4% from 2008 to 2014 ranks 5th among a group of comparison states, while its annual GSP growth rate of 1% ranks 6th.

Source: Brookings Institution, Export Monitor 2015.

Addendum

Economic Impact Report

The Virginia Chamber of Commerce Education Foundation contracted with the Raymond A. Mason School of Business, College of William and Mary, for Dr. Roy L. Pearson, Professor Emeritus, to prepare estimates of the Virginia economic impacts of Virginia export production of goods and services for 2014. The impact estimates are based on the export production data available at the 4-digit NAICS level from the Brookings Institution Export Monitor released May 13, 2015. The database includes the current-dollar estimates by years of the gross output of Virginia exports for 91 goods industries and 40 service industries. Impact models were used to quantify the gross output, value added, compensation, employment (direct, indirect, induced, and total) and tax revenues related to Virginia export activity overall, for goods and services, and in nine sectors.

The full report, *Virginia Export Production Impacts*, is available for download here:

<https://www.dropbox.com/s/hciitnte0hjlxes/Virginia%202014%20Export%20Production%20Impacts.pdf?dl=0>

Detailed Data

The full set of export data used for this analysis is available for download here:

<https://www.dropbox.com/sh/sjlnaxyx9yy6d6y/AAD-ifyCpnKc0h8J-6DIg9t0a?dl=0>

Appendix

Brookings and Census Export Data

The Brookings data employed in this report is designed to differ from the Census data traditionally used to measure state and regional goods trade flows. Rather than tracking the value of exports based upon their point of departure from the U.S., the Brookings data estimates export values based on where exportable goods (and services) are produced. The majority of U.S. goods exports are not shipped from ports in the same region in which they were produced, so these two data sources often yield very different results. The table below shows the 10 goods subsectors that represent the largest differences between Brookings estimates and Census export values for Virginia in 2014.

Differences Between Brookings and Census Export Values, by Subsector			
Virginia Subsector	Difference (Brookings- Census), \$ Mill.	Census Value, \$ Mill.	Brookings Value, \$ Mill.
Meat & Poultry Products	1,338	552	1,889
Ships & Boats	650	6	656
Snack, Coffee, & Condiments	622	130	752
Beverage Products	399	78	477
Electrical Equipment	335	248	583
Petroleum & Coal Products	-341	619	279
Paper Products	-381	759	378
Computer Equipment	-572	627	55
Ag, Forestry, and Fishing Total	-740	1,474	734
Semiconductors	-805	999	193
Total	533	18,345	18,878

Meat & Poultry products, for example, is a subsector in which Virginia firms produce a large value of exported goods (estimated at \$1.8 billion), but shipments of those goods through Virginia ports are relatively small (\$552 million). Conversely, Semiconductors is an example of a subsector in which shipments through Virginia ports are large (\$999 million), but Virginia firms produce relatively little value for export (\$193 million). This difference implies that most of the semiconductors being shipped from Virginia ports are produced in other states.

Though the Brookings and Census values by subsector differ substantially in some cases, the aggregate goods export values from each source happen to be similar, at \$18.9 and \$18.3 billion, respectively.

Neither data source is better or more accurate than the other. Each is designed to capture different elements of export flows. The Brookings data is well suited for this

analysis because it is intended to provide state and metro area EDOs a detailed understanding of the role of goods and services export production in their economy, including trends by region and sector. For a more technical discussion of the Brookings methodology and its relation to Census and other data sources, see:

<http://www.brookings.edu/~media/research/files/interactives/2015/export-monitor/brookings-export-series-methodology-nm-5715.pdf>

Export Sector and Subsector Definitions

Export data produced by Brookings provides estimates for both goods and services at broad and more detailed sector levels. For this report, North American Industry Classification System (NAICS) 2-digit data (broad sectors) and 4-digit data (more detailed subsectors) are provided for goods exports. Services exports are not tracked by any source using NAICS sector categories; therefore Brookings has combined services industries (exports from which are tracked by the Bureau of Economic Analysis) into broad sector groupings and detailed subsectors that correspond to groupings of 2- to 4-digit NAICS categories. A table in the Brookings methodology document (link above) provides detail on the definitions of sectors and subsectors and the relationships between them.