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Tennessee and the International Economy

State Export Competitiveness

by Steven G. Livingston

With exports equaling almost 14% of the total American economy, success or failure in foreign markets is of increasing concern across the U.S. and across Tennessee. Much of future economic growth resides in those markets. On one hand, it's relatively easy to assess current trade performance. One can look at the growth in the value of exports, at trade balances, or at comparisons to other exporters. It's harder, however, to examine the future! How well will a region's exports fare going forward? Much of the answer of course resides in trends in global growth and trade openness, but competitiveness is also an important consideration. Not all local economies are similarly placed to take advantage of global market trends.

There are several ways to attempt to assess export competitiveness. One is at the level of firms. How many exporters are there? Are they exporting as much as they "ought to" given their size and product mix? Does the economy have more exporters, or fewer, than one might expect given the industries located there? We have devoted several past issues of *Global Commerce* to examining Tennessee from this perspective. Another way to assess competitiveness, though, is to ask whether an economy is producing what markets want. The best typewriter company in the world (if such a company still exists!) is in desperate straits. There's no market. That's an extreme example, but the idea holds. A key to competitiveness is to be invested in goods and services that are experiencing increasing, not falling, demand.

From this perspective, how does Tennessee stack up? Is its production evolving with changes in world markets? There are several methods to get at this question, but the central idea is to determine which industries and goods are increasing their global share of trade and then see if the local economy is invested in those sectors. If it is, that bodes well for future exporting success. If not, that may spell trouble and at least suggests a significant headwind in coming years.

Many people assume the fastest growing products are those that involve new technologies or high tech. They are wrong. Over the past decade, growth in world markets has come largely from China and other emerging markets, and the products gaining market share reflect their needs and industries. The chart of those products that have gained the most market share in recent years shows that while, yes, there are a few electronics items, in fact most are commodities used in basic industrial production. (These calculations exclude trade in oil and gas. In 2012, that amounted to about 17% of the total value of global imports.) In fact, if we look at those products for which either the U.S. or Tennessee has forged the biggest gains in global market share, we see a mix of high- and low-tech goods.

Two ways to evaluate whether an economy is producing in the "right sectors," the ones growing disproportionately rapidly, are to see what percentage of its trade is in these sectors and to calculate its demand-adaptability index. The first is straightforward. The larger the percentage of exports that are in dynamic, growing areas, the better the likely future export performance. The demand-adaptability index, developed by the Cambridge economist José Gabriel Palma, is a more formal measure of the degree to which an economy is able to adapt to changing global markets. Essentially it's the ratio of the value of exports that are in dynamic, growing sectors over the value of exports that are not, weighted by the sizes of all the sectors.[1]

The hardest part of either calculation is to choose the baseline years. The global crash of 2008 was so large that it can easily distort comparisons. For that reason, we provide a comparison using 2007 as the baseline

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1. Appendix I, J.G. Palma's "Flying Geese and Waddling Ducks: The Different Capabilities of East Asia and Latin America to 'Demand-Adapt' and 'Supply Upgrade' their Export Productive Capacity," in Mario Cimoli et al., *Industrial Policy and Development* (Oxford University Press, 2009); Nalitra Thaiprasert, "U.S. Export Adaptability at the State Level," Ball State University Center for Business and Economic Research (2011). Palma's index was developed using OECD imports. The indices calculated in this article use total world imports.

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and a second using 2002. (The most recent world trade figures are for 2012.) A higher percentage of exports in dynamic sectors is a positive sign. Both the U.S. and Tennessee have improved on this measure over the past decade. If we evaluate exports based on growing market share since 2002, about 53% of American exports are in dynamic sectors, whereas about 47% of Tennessee exports are in these same sectors. If we take 2007 as the baseline, the U.S. share rises a bit to 55%, while Tennessee's rises significantly to 57%. This might lead us to conclude that Tennessee began with a less competitive export profile at the start of the century but has more rapidly shifted into stronger export sectors.

That conclusion seems supported by looking at the demand-adaptability indices. The U.S. index over the entire 10-year period is 1.22, a modestly positive export profile if 1 is average. When we divide the decade into "pre" and "post" crash, we find the U.S. emerged after the crash with a stronger adaptability to global demand (1.42) than it had in the years just before it (1.07). Tennessee, with a .58 overall index, is even starker. In the first years of the century, it scored quite poorly (.449). (You may recall several years of rather insipid state export growth over this period.) However, after the crash, its index of 3.24 is signaling the state economy has become markedly stronger in its export profile.

Why did Tennessee shift so much? In a nutshell, at the start of the century, Tennessee still exported significant amounts of apparels, a relatively declining export industry globally, while its other major export sectors (cotton, transportation equipment, chemicals) were experiencing what turned out to be temporary global lulls. After the crash, these three industries came back strong. They were joined by newer or greatly expanded export industries (computer products, pharmaceuticals, medical goods, artificial filament tow) and a few old reliables (whiskey) that are all increasingly large sectors of global trade. As a result, the state's exports, weighted by commodity market shares, are more heavily located in relatively growing markets than even 10 years ago.

At the local level

We can extend this analysis within Tennessee. Which regions of the state might be considered the most competitive based on their adaptability to changing global market demands? To calculate this, we made a few changes. Because global trade is compiled based on the Harmonized System, while most local economic

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Largest Increase in World Trade Share 2002-12

(HS codes in parentheses)

Iron Ores (2601)	382%
Printers (8443)	311%
Cow Hides & Leather (4104)	292%
Copper Scrap (7404)	271%
Gold (7108)	249%
Copper Ores (2603)	248%
Ethyl Alcohol (2207)	227%
Cell Phones and Parts (8517)	221%
LCDs and Lasers (9013)	215%

Share of World Market

America's Dominant Commodities

Civil Aircraft and Parts	92%
Bombs and Ammunition	85%
Prepared Fruits and Nuts	69%
Forage	65%
Food Starch Residues	57%
Nuts	53%
Artificial Filament Tow	42%
Cow Hides	37%

Tennessee's Dominant Commodities

Artificial Filament Tow	27%
Cellulose and Derivatives	11%
Coloring Matter and Pigments	5%
Cotton	5%
Miscellaneous Pharmaceuticals	4%
Sauces and Condiments	0%
Medical Instruments	3%
Whiskey	2%

Largest Increases in World Market Share

(HS codes in parentheses)

U.S.

Semifinished Iron and Steel (7207)	693%
Nucleic Acids and Salts (2934)	484%
Soybean Flour (1208)	455%
Palm Oil (1511)	291%
Copper Ore (2603)	250%
Prepared Milk and Cream (0402)	233%

Tennessee

Soybeans (1201)	28,457%
Whey and Milk Products (0404)	24,189%
Steel Bars (7228)	6,436%
Miscellaneous Pharmaceuticals (3006)	4,889%
Spark-Ignition Engines (8407)	2,894%
Prepared Unrecorded Media (8523)	2,663%
Iron Bars and Rods (7214)	2,453%
Civilian Aircraft and Parts (8800)	1,770%
Electric Signaling Apparatus (8531)	1,148%

4th Quarter 2013 — TENNESSEE'S LARGEST EXPORT SECTORS

	Value of Exports	Change from Last Year	Change from Last Quarter
Medical Equipment	$884,071,949	12.3%	-2.2%
Motor Vehicle Parts	$711,518,088	-1.9%	0.7%
Motor Vehicles	$711,327,821	81.2%	24.6%
Computer Equipment	$583,955,044	10.8%	12.5%
Basic Chemicals	$526,465,010	11.1%	-2.6%
Aerospace Products	$465,413,699	19.6%	35.5%
Synthetic Fibers and Filaments	$429,320,148	4.2%	-7.7%

4th Quarter 2013 — WHAT'S HOT AND WHAT'S NOT*

**Among Tennessee's top 100 exported goods*

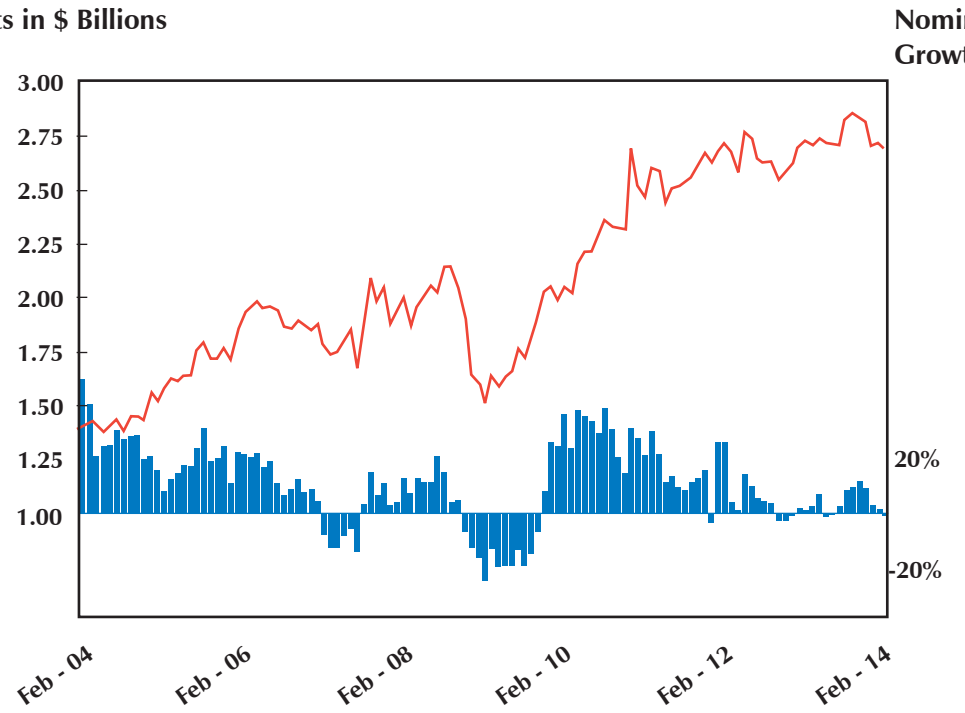
	Value of Exports	Growth	Decline
Sectors with the Greatest Growth			
Miscellaneous Iron and Steel Articles	$39,650,813	133.4%	
Refined Oil	$13,299,549	123.9%	
Passenger Cars	$707,234,532	82.0%	
Aluminum Waste and Scrap	$10,339,372	81.1%	
Printers	$24,749,529	78.1%	
Sectors with the Greatest Decline			
X-Ray Equipment	$6,478,374		-79.1%
Coated Paper	$8,167,248		-61.0%
Antisera and Blood	$12,890,146		-48.3%
Video Game Machines	$20,027,394		-43.1%
Engines and Parts	$7,065,582		-40.4%

4th Quarter 2013 — FASTEST-CHANGING EXPORT DESTINATIONS*

**Among countries averaging > $5m sales/quarter*

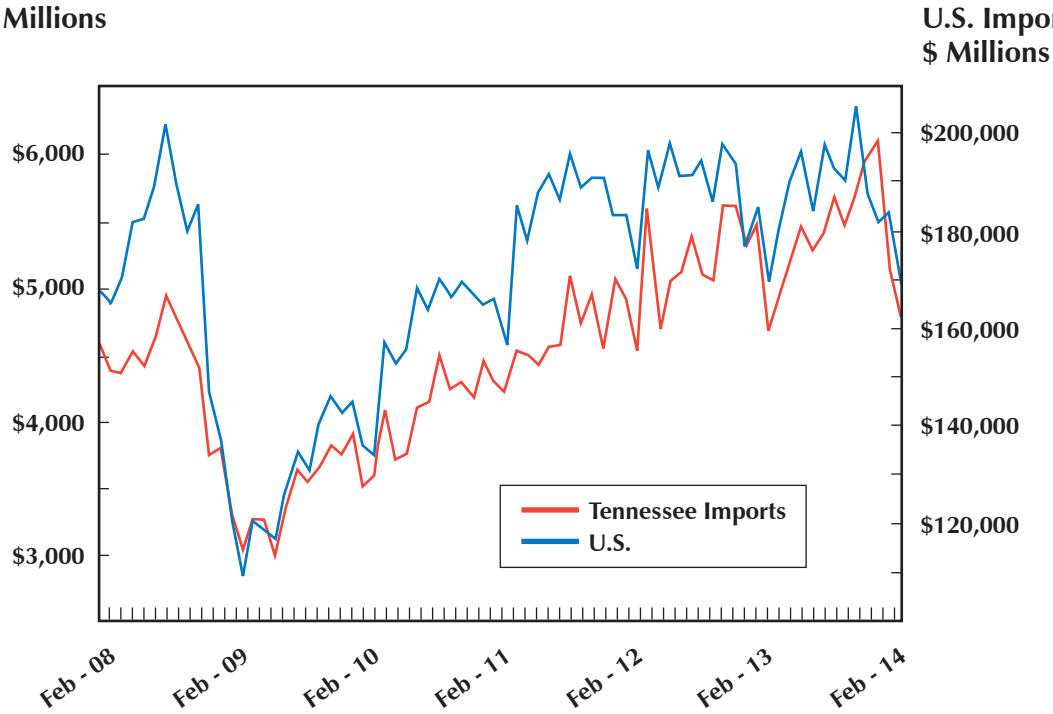
	Value of Exports	Gain	Decline
Countries with the Greatest Growth			
Egypt	$34,375,235	256.9%	
Luxembourg	$23,829,318	224.2%	
Morocco	$4,743,386	124.6%	
Saudi Arabia	$108,378,996	109.7%	
Turkey	$102,940,668	95.5%	
Countries with the Greatest Decline			
Bangladesh	$1,748,184		-81.2%
Nigeria	$8,468,248		-57.9%
Jamaica	$4,757,577		-49.3%
Venezuela	$13,874,689		-43.3%
Ukraine	$5,036,104		-43.1%

TENNESSEE MONTHLY EXPORTS

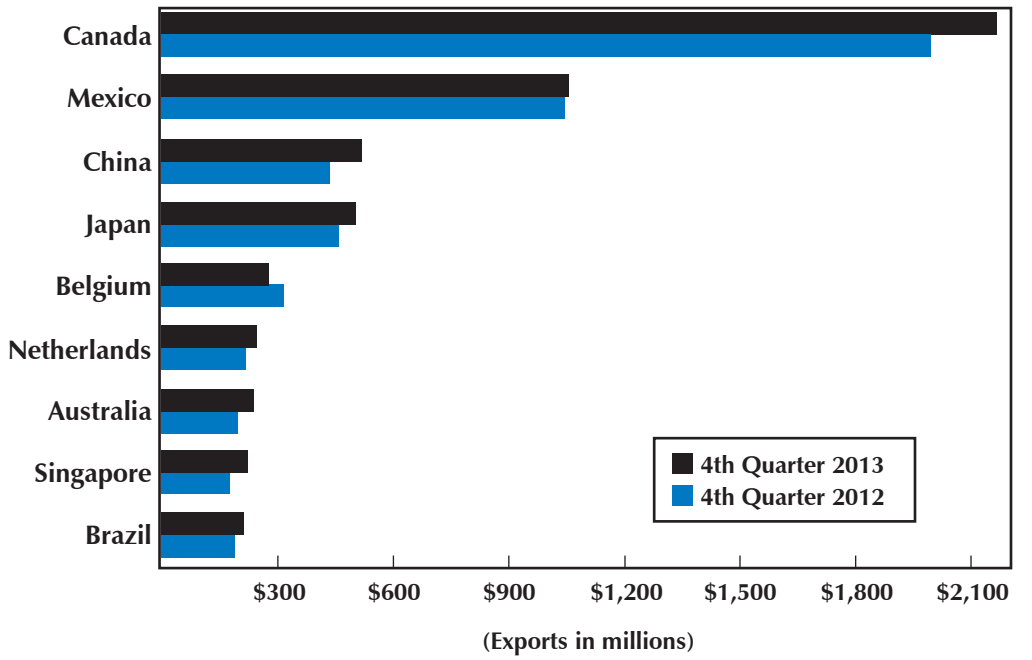


(Seasonally adjusted, expressed in 2013 dollars)

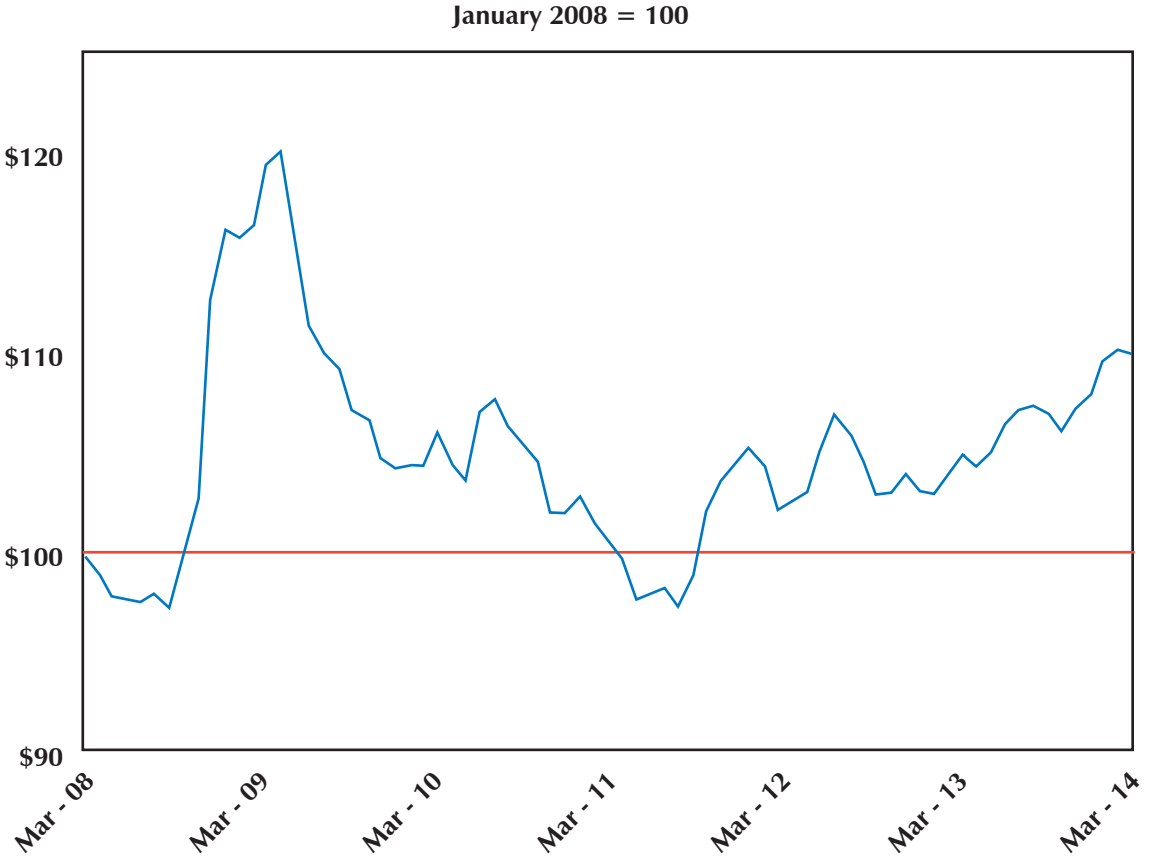
TENNESSEE MONTHLY IMPORTS



TENNESSEE'S LEADING TRADE PARTNERS



TENNESSEE TRADE-WEIGHTED DOLLAR INDEX



Third consecutive quarter over $8 billion

Tennessee export growth far outstripped that of the nation in the fourth quarter. Tennessee exports grew at double the country's rate (7.56% to 3.7%). The $8.23 billion in exports marks the third consecutive quarter that state exports crossed the $8 billion mark. The strong quarter enabled Tennessee to end the year with an increase of $1.2 billion in foreign sales over 2012 (to $32.4 billion). The year's 4.02% export growth rate also just about doubled America's (2.14%).

The reason? In one word: cars. Passenger car and SUV exports soared at the end of 2013. In the fourth quarter of 2012, the state shipped passenger vehicles valued at $387 million. In 2013, their value was $703 million, an increase of over 80%. This accounted for more than half of the state's quarterly increase in exports. The remarkable thing is how global were the gains. In Australia, Tennessee automobile shipments rose from virtually nil to about $62 million, and in Brazil, from nothing to $17 million. Sales to China climbed $30 million (to $44 million), to the Netherlands $21 million (from virtually zero), and to Saudi Arabia $50 million. Canada saw the largest gains of all. Automobile shipments north of the border grew over $100 million from 2012 (from $119 million to $247 million). Ironically, the only major market to which car shipments fell was South Korea, where automotive exports were so recently at issue in its free trade pact with the U.S. Car sales to Korea halved, from $33 million to $16 million, in the fourth quarter. The big gains in Australia were likely a byproduct of several automotive plant closures down under. But elsewhere the gains reflect the growing model lines that Nissan, Volkswagen, and GM are exporting out of the state. To take two examples, the Nissan Pathfinders sold in Australia and New Zealand are coming from Smyrna while the Volkswagen Passats sold in the Middle East now come from Chattanooga.

Cars were definitely the quarter's big story, but the rest of the state economy also racked up over $250 million in new exports. A large portion of these were in the medical sector. The foreign sales of orthopedic goods increased by more than $70 million (to $277 million), while pharmaceuticals were up $14 million (to $134 million). Medical instruments added another $22 million (to $704 million). As per the past several quarters, the gains in this sector were primarily in Japan and Singapore, though several markets in Latin America, notably Brazil and Colombia, also performed very well. Just behind medical goods stood aircraft, computer industry, and whiskey exports. Aircraft-related exports gained almost 20% for the quarter (to $464 million). The single largest market gain was in Turkey, but Egypt, Singapore, the United Arab Emirates, and Colombia all increased their purchases of Tennessee-produced aircraft equipment by more than $10 million each. Solid gains by the state's printer manufacturers propelled the computer industry to increases in the neighborhood of $40 million. Whiskey sales broke the $200 million barrier for the quarter. That was an increase of 20%. Half of this increase was in Europe (France, Germany, and the UK, primarily), a remarkable feat in a region where imports are basically flat. In fact, total Tennessee sales to Europe were basically unchanged for the quarter (at just a shade over $1 billion).

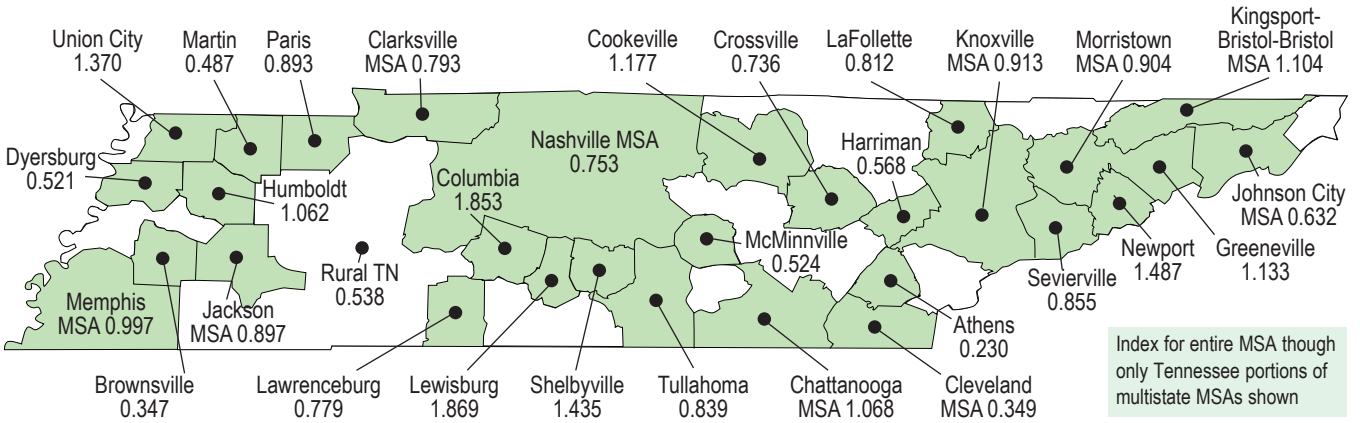
Only a handful of industries suffered serious export reverses. The largest was the video game industry. A large decline in shipments to Canada led to a quarterly fall of nearly $32 million from a year ago (a nearly 30% decline). Machinery exports were generally down, as were those of engines and generators. Cotton and synthetic fiber shipments both fell, suggesting a general slowdown in the global apparel industry.

Cars were definitely the quarter's big story.

Surveying by region, we have noted the large European market is essentially seeing no growth. However, it was a strong quarter in Southeast Asia, where Tennessee shipments gained 20% for the quarter, in China, in Japan, and in Canada. The Canadian figures were particularly welcome, as this has been a problematic market for the state for most of 2013. Led by cars and computers, Tennessee sent almost $200 million more to Canada than a year ago. The state's Canadian exports of $2.26 billion amounted to more than a quarter of all Tennessee exports in the fourth quarter. At the end of the day, Tennessee's export performance is first and foremost based on Canada.

Early returns on 2014 are mixed. Though car shipments are continuing to soar, overall exports were flat in January and February. However, much of that is the result of large declines in one exported good: cotton. As the year progresses, we will see if other state export industries can make up for the slack. ■

Demand-Adaptability Index* — Tennessee Regional Export Performance



* Ratio of the value of exports that are in dynamic, growing sectors over the value of exports that are not, weighted by the sizes of all the sectors. A value of 1 = average.

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statistics in the U.S. use the NAICS system, we compare state regions to total U.S. exports rather than world imports. (It is possible to convert between the two systems, but it isn't easy, and the results depend upon the level of detail at which the conversion is made). So we are now asking "to what degree is the region's economic activity located in America's strongest export sectors?" An index of 1 is average. We use the Brookings Institution's estimates of regional exports. These are imputations based on which industries are in the region, so we might better see these indices as telling us the industry component of a region's overall export competitiveness. That is, they do not totally capture the quality of the firms located in the region; they only account for the impact of which industries are located in the region. Finally, to dampen year-to-year swings, which are more important in a smaller economy, we compare the 2003/4 average to the 2011/12 average.

We see enormous diversity across the state in fundamental export competitiveness. For 2011/12, the highest (modified) demand-adaptability index is that of the Lewisburg micropolitan area (1.87). Though currently a relatively small exporting region, the metalwork, chemicals, and engines it produces are all among America's most robust export industries. Ten of the state's 31 statistical regions (30 metro- or micropolitan statistical areas + the remaining part of the state) scored above 1.[2] The lowest score is Athens' .23. Its economy is heavily based in auto parts and electronics, both of which are slowly losing their share of American exports. As might be expected from our look at the entire state, most of its regions have improved in competitiveness over the past decade. In 2003/4, not a single region scored as even average. In the years since, Athens was the only area that saw its index go down, and even that was trivial (.245 to .23). Columbia joined Lewisburg in basically tripling its score. The map above indicates each region's index. Please refer to *mtsu.edu/globalcommerce* for a map showing raw exports (in dollar amounts) and percent of those exports in industries that are gaining in their share of American exports.

There are many ways to evaluate an economy's export possibilities and competitiveness. Here we looked at what an economy produces and sells. Is it where the global demand is? Is it where that demand is growing most rapidly? We are heartened by a significant improvement in Tennessee's position from a decade ago. That said, things can change fast. Competitiveness is a continuing process, not a final result. ■

2. This article uses statistical areas as defined at the time the data was collected. The OMB redefined these areas in 2013.

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