DISTRICTDIGEST

The Great Trade Collapse: Past, Present, and Future in Fifth District Export Activity

BY SONYA RAVINDRANATH WADDELL

For much of the past decade, and particularly as the recession began to take hold in 2007, international demand for U.S. consumer goods was hailed as a way to replace declining domestic demand. In fact, until October 2008, international trade was considered a bright spot in the U.S. economy, with exports of goods and services peaking in that month at 13.2 percent of U.S. GDP. In October 2008, however, U.S. exports began to plummet, and over the fourth quarter alone exports fell nearly II percent. Although output was also falling, by the second quarter of 2009 export activity had dropped to 10.6 percent of GDP.

Trade activity in the Fifth Federal Reserve District also contracted notably during that period. In fact, while goods exports in the nation fell 26.9 percent from the third quarter of 2008 through the second quarter of 2009, Fifth District exports fell 22.2 percent. This was the sharpest export contraction on record for the Fifth District. And, although trade activity has recovered considerably since the middle of 2009, exports are still below their prerecession levels. Analyzing export changes in the Fifth District over the past two years requires an understanding of what happened to trade on a national and global level. Any speculation on the magnitude of export activity in the Fifth District going forward, and its role in the Fifth District economy, will also require a careful understanding of the industrial and geographic makeup of Fifth District exports.

The Great Trade Collapse

U.S. export activity experienced an unprecedented contraction in the winter of 2008-2009. From the third quarter of 2008 to the second quarter of 2009, total real export values fell at a 10 percent average quarterly rate. But the decline in



U.S. trade activity was really a decline in global trade. World trade experienced its sharpest drop in recorded history and deepest contraction since World War II. All 104 nations for which the World Trade Organization reports data experienced contracting imports and exports during the second half of 2008 and into 2009.

It is no coincidence that the trade contraction coincided with a slump in global output. As a country's economy slows, demand for goods — including imports — will decline. There is a close connection between trade and GDP: Falling demand for imports in a country typically is connected to a decline in export activity with the country's major trading partners which will, all else equal, contribute to output falling further. In fact, according to a 2010 paper by economists Rudolfs Bems, Robert C. Johnson, and Kei-Mu Yi, of the 14 countries that collectively account for three-quarters of world GDP, only India and China experienced growth in the last quarter of 2008 and the first quarter of 2009.

It would be easy to conclude, then, that it was simply falling GDP, and reduced demand for global goods, that led to this unprecedented fall in trade activity. However, world trade activity contracted considerably more than world GDP — anywhere between four and 25 times more, depending on the source (and time period) chosen. In the United States, for example, while real export activity fell almost 28 percent from the third quarter of 2008 through the second quarter of 2009, over the same period real GDP declined only 3.2 percent (at a 1.1 percent average quarterly rate).

There are a number of theories as to why the trade contraction so considerably outpaced the drop in GDP. First, the composition of GDP and the composition of traded goods can be quite different. There is strong evidence that the drop in demand was dominated by a narrow range of "postponable" goods, such as consumer durables and investment goods. These goods make up a small share of world GDP but a large share of world trade.

Bems, Johnson, and Yi cited data from the Bureau of Economic Analysis that showed domestic demand for durable goods decreasing by 18 percent, while demand for nondurables decreased by only 1 percent. A contraction in demand for manufactured goods would affect trade in the United States and the Fifth District more severely than it would tend to affect the overall economy of either. In the third quarter of 2008, the manufacturing sector accounted for less than 10 percent of employment in the United States, but almost 80 percent of total goods exports. In the Fifth District, the manufacturing sector accounted for almost 90 percent of exports in the same quarter, but less than 9 percent of payroll employment.

Another explanation for the global trade decline — or at least for its synchronized nature — lies in the increasing globalization of production processes, or the expansion of "vertical linkages" in production. An increasingly large share of trade involves goods at different stages of the production process, and creating a final good involves many different countries. These vertical linkages can propagate shocks because a reduction in demand for a final good is felt in every country with a role in the good's production. Negative demand shocks can also asymmetrically affect industries whose production processes involve more vertical linkages.

Finally, an explanation for the steep and sudden trade decline lies in the nature of this particular recession. In September 2008, a number of exceptional things happened: The U.S. government put mortgage giants Fannie Mae and Freddie Mac into conservatorship, the investment firm Lehman Brothers filed for bankruptcy, and U.S. policymakers took action to prevent the failure of the insurance company AIG. These events not only created uncertainty about the future, forcing many households and businesses to rein in spending, but they also led to a global credit market freeze. The deteriorating credit conditions could have affected trade finance, thus contributing to the sharp contraction in activity. However, research suggests that the decline in demand for goods – which stemmed in part from uncertainty about the economy - and the vertical integration of supply chains had a stronger impact on trade than did a decline in credit availability.

The Fifth District in the Trade Collapse

To what extent was the decline in Fifth District export activity the result of the factors discussed above? To answer this question, it is important to explore changes in the economic environment faced by the District's major trading partners and explore the types of industries that faced the sharpest contraction in exports. It will also be

instructive to better understand the makeup of District exports and how they differ from exports in the United States as a whole. Because there is not much state-level data on services exports, "exports" in this section refers to exports of goods. Goods exports make up about 70 percent of U.S. export activity, and the U.S. decline in goods exports was more severe (26.9 percent) than the decline in services exports (10.3 percent). Furthermore, our industry analysis includes only exports of manufactured goods, which make up about 80 percent of U.S. goods exports and 90 percent of Fifth District goods exports.

Clearly, a drop in international demand was a factor in the Fifth District export con-

Export Similarity Index 100 90 80 70 60 50 40 30 20 10 0 2000 2008 2009 2001 2002 2003 2005 2006 2007 2010 1999 200 SOURCE: Calculated using data from WISER/Haver

traction. Of the top 20 importers of District goods, which together consume almost 80 percent of District exports, at least 15 saw notable declines in GDP from the third quarter of 2008 through the second quarter of 2009. Overall, the demand conditions faced by District exporters do not differ much from those faced by exporters in the United States as a whole, since the Fifth District's major export destinations are not significantly different from the major destinations of national exports.

Of the top 20 export destinations of U.S. and Fifth District goods, only six destinations are not shared. (The Fifth District's major importers include the United Arab Emirates, Saudi Arabia, and Egypt, while those of the United States include Switzerland, Malaysia, and Colombia.)

The industrial makeup of Fifth District exports is also very similar to that of the United States. To measure the similarity between the sectoral concentration of Fifth District states' manufacturing exports and that of the United States as a whole, we calculate an export similarity index. We use the measure proposed by Finger and Kreinin (1979) and used in a similar manner by Coughlin and Pollard (2001). The index ranges from zero to 100, with zero indicating complete dissimilarity and 100 indicating that the state's sectoral distribution of exports is identical to the national distribution.

QUICK

The Export Similarity Index is constructed by calculating a particular industry's share of a state's total exports and comparing that to the same industry's share of national exports. For each industry, we compare the state share to the national share, take the minimum, sum the 20 values, and multiply by 100. The Fifth District export similarity index has hovered around 80 for most of the past decade, indicating a sectoral distribution that is quite similar to the U.S. distribution. The two jurisdictions with consistently the lowest index — West Virginia and the District of Columbia — are also the two regions of our District that contribute the least to total manufactured exports (7.1 percent and 1.3 percent, respectively, in the first quarter of 2010).

Another interesting note about the Fifth District similarity index is that it has trended up in the last 10 years, indicating that the industry makeup of Fifth District exports is slowly converging to that of the nation. In the fourth quarter of 2008 and the first quarter of 2009, when exports were falling most severely, the export similarity index reached a series high of more than 85. At least part of the explanation for this convergence lies in the declining auto sector; the transportation equipment's share of District exports fell notably in this period and began to match the national share.

Exports of transportation equipment did, in fact, make up the largest portion (34 percent) of the District export decline. In the second quarter of 2008, transportation equipment made up almost 24

percent of all Fifth District exports; that number had dropped to about 18 percent by the second quarter of 2009 and did not improve much in the ensuing quarters. This coincides with national problems in the motor vehicles sector that also helped to drive the collapse in total U.S. trade. Exports of transportation equipment in that year fell 38 percent in the United States compared to 34 percent in the Fifth District, but the industry's share of total exports remained around 19 percent in the United States.

Despite the transportation equipment industry's high share of total losses, five District industries saw export levels fall at a faster pace than the transportation equipment industry. Petroleum and coal products had the sharpest fall, followed by primary metals, beverages and tobacco, furniture, and apparel. In other words, firms across District industries suffered declining exports in this period; firms exporting transportation equipment did not dominate the trade collapse in our region. And, although all industries experienced accelerated export declines from the third quarter of 2008 through the second quarter of 2009, a few industries had been seeing falling exports for some time.

Exports from the apparel industry, for example, fell at an average quarterly rate of 2.4 percent from the beginning of the decade to the third quarter of 2008 (at which point the decline accelerated to an average 14 percent quarterly). The beverages and tobacco industry exports also declined at a 3.3 percent average quarterly rate before the trade collapse, and

	U.S.	Fifth District
(1)	Canada (19.5%)	Canada (18.1%)
(2)	Mexico (12.5%)	China (8.1%)
(3)	China (7.1%)	Germany (5.9%)
(4)	Japan (4.9%)	Mexico (5.8%)
(5)	U.K. (4.2%)	U.K. (4.8%)
(6)	Germany (3.9%)	Japan (4.7%)
(7)	South Korea (3.2%)	Netherlands (3.4%)
(8)	Brazil (2.6%)	France (2.9%)
(9)	Netherlands (2.6%)	Brazil (2.9%)
(10)	Singapore (2.4%)	Belgium (2.8%)
Total	62.9%	59.4%

17.4 percent starting in the third quarter of 2008.

Although no industry has yet recovered to the export levels seen before the collapse, only three industries have continued to see export declines. For two industries — printing and chemicals — the average quarterly decline has abated notably. Although declines in District exports of petroleum and coal products moderated, exports continued to fall at a 12.5 percent average quarterly rate since the second quarter of 2009.

Export Diversification

Globalized production processes almost certainly contributed to export declines in certain industries. However, it is outside of the scope of this article to examine the extent to which that was a factor in their decline. It seems likely that the role of various factors in the trade decline differed across industries; certainly the disproportionate decline in demand for durables played a role in the transportation equipment and furniture export sectors. We do, however, explore the extent to which the recent trade collapse might have altered the level of diversification of Fifth District exports. Were certain industries permanently affected by the trade collapse? To better understand the diversification of Fifth District exports and how that might have changed, we engage the Hirschman-Herfindahl (HH) index used by Gazel and Schwer (1998). We use the index to measure the relative concentration of tradeable sectors and individual export markets for the United States and for Fifth District states. See tables on page 39.

The HH index is the sum of squares of all market shares and therefore ranges from one, which indicates total concentration in one sector, to one divided by the number of sectors, which indicates complete diversification. Because we would like to be able to compare industry and export destination diversification within a state, we use the same number (20) of international markets as we had

The Origin of Movement (OM) data contain export sales (or free-alongside-ship costs if the good is not sold) from U.S. states and territories to 242 foreign destinations, classified by NAICS subsectors. The data are published by the Census Bureau and the World Institute for Strategic Economic Research (WISER). The OM data reflect the transportation origin of exports, not their origin of production, a limitation that has deterred many academics and practitioners from using the data set. However, work by Andrew Cassey in 2006, and Ron Cronovich and Ricardo Gazel in 1999, indicates that OM data are usable for Origin of Production data with the primary disclaimer that OM data can be inaccurate for agricultural and mining exports. In order to limit inaccuracy, we confine our analysis primarily to data on manufactured goods and, for time-series reliability, only to data collected after the institution of NAICS categorization in 1997. NAICS codes for manufactured exports. For every state, the top 20 export destinations accounted for at least 75 percent of all exports and as much as 92 percent in the District of Columbia.

On the whole, once again, the Fifth District and the nation look rather similar. Turning first to the HH indexes for export destination, it is clear that although District exports began the decade more concentrated than national exports, they later became less concentrated. This does not mean that the Fifth District had more export destinations, since in creating this index we constrained ourselves to the top 20 importers of District and U.S. goods. The lower index in the District simply means that regional exports were more widely spread among those top 20 export destinations than total U.S. exports. There is some intuition behind this finding - many states in the United States are geographically and culturally closer to some of our nation's major trading partners such as Mexico, Canada, and parts of Asia than Fifth District jurisdictions. Within the District, exports from Washington, D.C., are the most concentrated, with more than 50 percent of D.C. exports going to the United Kingdom or the United Arab Emirates. On the other hand, Maryland and, increasingly,

Virginia have had the lowest export destination HH indexes among the Fifth District states.

The HH export destination index has been generally trending down. This index reached a low of 0.074 in the fourth quarter of 2008 and has since returned to first quarter 2009 levels. It is not clear, though, if we are going to see a reversal in the downward trend of the index. It is likely that at least part of the drop in the index can be attributed to the collapse in exports to Canada in the fourth quarter of 2008. Fifth District exports to Canada fell by almost half in the fourth quarter of 2008 as Canada's share went from 17 percent of total District exports to 10 percent. By the fourth quarter of 2010, however, exports to Canada returned to about 18 percent of District exports.

Turning to the industry concentration of exports, we find that until 2008, Fifth District exports were often

Hirschman-Herfindahl Export Concentration Indexes: **Export Destination**

U.S.	Fifth District
0.137	0.141
0.125	0.123
0.130	0.117
0.132	0.121
0.128	0.115
0.132	0.126
0.131	0.127
0.121	0.111
0.115	0.103
0.111	0.091
0.113	0.097
	U.S. 0.137 0.125 0.130 0.132 0.132 0.131 0.131 0.121 0.115 0.111 0.113

SOURCE: Calculated using data from Bureau of the Census/Haver, WISER/Haver

Hirschman-Herfindahl Export Concentration Indexes: **Export Sector**

	U.S.	Fifth District		
2000:Q1	0.135	0.097		
2001:Q1	0.136	0.095		
2002:Q1	0.139	0.106		
2003:Q1	0.133	0.115		
2004:Q1	0.136	0.118		
2005:Q1	0.129	0.119		
2006:Q1	0.128	0.109		
2007:Q1	0.127	0.119		
2008:Q1	0.118	0.124		
2009:Q1	0.117	0.127		
2010:Q1	0.115	0.126		
SOURCE: Calculated using data from Bureau of the				

notably less concentrated than those in the nation. Again, D.C. has a high HH index, but we also find South Carolina and Maryland to have notably high levels of sector concentration. Almost 50 percent of South Carolina exports are in machinery and transportation equipment, and an additional 17 percent are exports in chemicals. Maryland also has more than 25 percent of its exports in transportation equipment, and an additional almost 25 percent in chemicals. Almost 15 percent of Maryland's exports are in computers and electronic products.

It is not immediately obvious that the trade collapse had a notable effect on the concentration by industry of District exports. The industrial concentration of regional exports trended up for most of the decade, and although the last few quarters have seen slightly lower index levels than the index peak in the second quarter of 2009, it is not clear that we are facing a regime shift.

The Fifth District is remarkably like the nation in export concentration by both industry and destination. It is not surprising, then, to see expansion and contraction in Fifth District export activity that closely tracks that of the United States as a whole.

Looking Forward: The Great Trade Recovery?

The export industry in the Fifth District has started to recover following the great trade collapse. District goods exports grew at an average quarterly rate of 4.8 percent from the second quarter of 2009 through the first quarter of 2010. U.S. export activity also expanded over the period as goods exports expanded an average 5.7 percent each quarter.

Nonetheless, international demand remains weak and total exports are not yet back to their pre-collapse levels either in the Fifth District or in the United States overall. Given the diversity of District exports, however, and the great similarity between regional and national export makeup and growth trends, Fifth District firms are well-placed to benefit from a national and global return to normal patterns – and growth – in trade activity. **RF**

- <

State Data, Q4:09

	DC	MD	NC	SC	VA	WV
Nonfarm Employment (000s)	702.1	2,499.1	3,890.9	1,809.4	3,602.5	735.4
Q/Q Percent Change	-0.2	-0.4	0.3	0.0	-0.4	-0.6
Y/Y Percent Change	-0.2	-3.1	-4.5	-4.3	-3.6	-3.4
Manufacturing Fundament (000s)	14	117 5	424.0	2075	222.0	40 5
	1.4	0.0	434.0	207.3	LJL.7	47.3
Q/Q Percent Change	0.0	0.9	-0.9	-0.0	-0.9	0.5
17 Y Percent Change	-0./	-0.0	-12.9	-12.1	-9./	-10.9
Professional/Business Services Employment	(000s) 149.0	383.5	464.4	208.4	636.7	59.0
Q/Q Percent Change	1.5	0.4	1.9	4.0	0.4	0.0
Y/Y Percent Change	-1.3	-2.6	-5.0	-2.7	-2.9	-3.0
Government Employment (000s)	245.0	491 3	777 2	351.8	697.4	148.6
Ω/Ω Percent Change	-0.6	-0.4	23	0.6	-0.4	-12
Y/Y Percent Change	4.0	0.2	2.3	12	-10	0.4
in thereene enange		0.2	2.1	1.2	1.0	0.1
Civilian Labor Force (000s)	332.5	2,960.5	4,521.7	2,172.7	4,147.3	788.5
Q/Q Percent Change	0.3	-0.6	-0.1	-0.3	-0.6	-1.1
Y/Y Percent Change	-0.4	-2.0	-1.3	0.4	-0.2	-1.8
Unemployment Rate (%)	11.6	7.3	10.9	12.3	6.8	8.9
Q3:09	10.8	7.2	10.9	12.1	6.9	8.6
Q4:08	7.7	5.4	7.8	8.7	4.8	4.9
Pool Percenal Income (CMil)	26 107 6	251 222 4	205 630 4	122 751 4	215 566 7	E2 340 4
Q/Q Percent Change	0.3	-01	0.2	0.3	-0.1	-0.3
V/V Percent Change	-0.5	-0.1	-0.0	-11	-0.1	-0.5
17 Trefeent Change	0.5	0.5	0.7	1.1	0.5	0.4
Building Permits	421	2,974	7,519	3,804	4,723	367
Q/Q Percent Change	158.3	23.3	-19.7	-12.9	-12.6	-50.1
Y/Y Percent Change	902.4	57.4	-6.7	10.5	-6.2	-8.9
House Price Index (1980=100)	572.8	442.0	327.7	333.5	420.6	225.3
O/O Percent Change	1.6	-1.7	-1.3	-0.7	-0.7	-0.4
Y/Y Percent Change	-1.5	-7.7	-3.4	-3.2	-4.3	-1.4
-						
Sales of Existing Housing Units (000s)	10.4	87.6	162.8	81.6	120.4	32.8
Q/Q Percent Change	18.2	16.5	13.7	11.5	-3.2	13.9
Y/Y Percent Change	62.5	49.0	32.6	25.2	14.0	41.4

NOTES: Nonfam Payroll Employment, thousands of jobs, seasonally adjusted (SA) except in MSAs; Bureau of Labor Statistics (BLS)/Haver Analytics, Manufacturing Employment, thousands of jobs, SA in all but DC and SC; BLS/Haver Analytics, Professional/Business Services Employment, thousands of jobs, SA in all but SC; BLS/Haver Analytics, Government Employment, thousands of jobs, SA; BLS/Haver Analytics, Unemployment, thousands of persons, SA; BLS/Haver Analytics, Unemployment Rate, percent, SA except in MSAs; BLS/Haver Analytics, Building Permits, number of permits, NSA; U.S. Census Bureau/Haver Analytics, Sales of Existing Housing Units, thousands of units, SA; National Association of Realtors*

Nonfarm Employment

Change From Prior Year First Quarter 1999 - Fourth Quarter 2009



-5%

-6%

99 00 01 02 03 04 05 06 07 08 09

Change From Prior Year First Quarter 1999 - Fourth Quarter 2009



FRB—Richmond Services Revenues Index First Quarter 1999 - Fourth Quarter 2009



Unemployment Rate

First Quarter 1999 - Fourth Quarter 2009



Unemployment Rate Metropolitan Areas Change From Prior Year First Quarter 1999 - Fourth Quarter 2009



FRB—Richmond Manufacturing Composite Index First Quarter 1999 - Fourth Quarter 2009





Change From Prior Year First Quarter 1999 - Fourth Quarter 2009





Building Permits

Change From Prior Year First Quarter 1999 - Fourth Quarter 2009



House Prices

Change From Prior Year First Quarter 1999 - Fourth Quarter 2009



NOTES:

 FRB-Richmond survey indexes are diffusion indexes representing the percentage of responding firms reporting increase minus the percentage reporting decrease.

The manufacturing composite index is a weighted average of the shipments, new orders, and employment indexes.

2) Building permits and house prices are not seasonally adjusted; all other series are seasonally adjusted.

SOURCES:

Real Personal Income: Bureau of Economic Analysis/Haver Analytics. Unemployment rate: LAUS Program, Bureau of Labor Statistics, U.S. Department of Labor, http://stats.bls.gov.

Employment: CES Survey, Bureau of Labor Statistics, U.S. Department of Labor, http://stats.bls.gov. Building permits: U.S. Census Bureau, http://www.census.gov.

House prices: Federal Housing Finance Agency, http://www.fhfa.gov.

Metropolitan Area Data, Q4:09 -

	Washington, DC	Baltimore, MD	Hagerstown-Martinsburg, MD-WV
Nonfarm Employment (000s)	2,393.1	1,270.7	96.8
Q/Q Percent Change	0.1	0.2	-0.5
Y/Y Percent Change	-1.7	-3.2	-4.0
Unemployment Rate (%)	6.2	7.6	9.4
Q3:09	6.2	7.7	9.1
Q4:08	4.3	5.4	6.3
Building Permits	2,874	1,325	145
Q/Q Percent Change	2.6	20.2	-30.3
Y/Y Percent Change	-1.8	93.7	-14.7
	Asheville, NC	Charlotte, NC	Durham, NC
Nonfarm Employment (000s)	165.7	806.6	284.6
Q/Q Percent Change	0.1	1.0	1.4
Y/Y Percent Change	-5.5	-6.1	-2.5
Unemployment Rate (%)	8.8	12.0	7.8
Q3:09	8.9	12.1	8.3
Q4:08	5.8	7.7	5.4
Building Permits	255	1,436	508
Q/Q Percent Change	-16.1	-28.0	27.6
Y/Y Percent Change	-3.0	-28.8	49.9
	Greensboro-High Point, NC	Raleigh, NC	Wilmington, NC
Nonfarm Employment (000s)	343.0	500.1	137.8
Q/Q Percent Change	1.1	0.9	-0.5
Y/Y Percent Change	-6.2	-4.2	-4.8
Unemployment Rate (%)	11.4	8.9	10.4
Q3:09	11.6	9.1	10.1
Q4:08	7.6	5.8	7.1
Building Permits	428	1,228	402
Q/Q Percent Change	-22.2	-7.8	-31.2
Y/Y Percent Change	-26.7	-1.3	-20.4

	Winston-Salem, NC	Charleston, SC	Columbia, SC	
Nonfarm Employment (000's)	208.7	283.6	347.6	
Q/Q Percent Change	1.0	0.3	1.0	
Y/Y Percent Change	-4.5	-4.3	-4.0	
Unemployment Rate (%)	10.0	10.3	10.0	
Q3:09	10.2	10.2	9.9	
Q4:08	6.8	7.0	7.2	
Building Permits	142	694	959	
Q/Q Percent Change	-56.8	-21.8	18.2	
Y/Y Percent Change	-46.0	-13.0	55.4	

	Greenville, SC	Richmond, VA	Roanoke, VA	
Nonfarm Employment (000's)	293.8	598.1	154.9	
Q/Q Percent Change	0.6	0.0	1.0	
Y/Y Percent Change	-6.2	-5.2	-4.6	
Unemployment Rate (%)	11.1	7.6	7.2	
Q3:09	11.1	7.8	7.5	
Q4:08	7.4	4.8	4.4	
Building Permits	352	816	103	
Q/Q Percent Change	-11.3	-16.2	-12.0	
Y/Y Percent Change	12.8	-21.9	0.0	

	Virginia Beach-Norfolk, VA	Charleston, WV	Huntington, WV	
Nonfarm Employment (000s)	734.1	147.3	116.4	
Q/Q Percent Change	-0.8	-0.3	1.4	
Y/Y Percent Change	-3.4	-4.7	-3.2	
Unemployment Rate (%)	6.9	7.3	7.8	
Q3:09	7.0	7.1	8.2	
Q4:08	4.8	3.4	5.2	
Building Permits	1,255	47	8	
Q/Q Percent Change	5.6	0.0	14.3	
Y/Y Percent Change	93.7	-17.5	60.0	

For more information, contact Sonya Ravindranath Waddell at (804) 697-2694 or e-mail Sonya.Waddell@rich.frb.org