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An Economic and Statistical Analysis of the Retail Sector in the Tri-Cities

Introduction

The retail sector in the Tri-Cities has undergone dramatic changes in recent years with the development of large-scale shopping centers, accompanied by the closing of a number of existing retail stores. The purpose of this study is: (1) to examine the factors affecting retail sales in the Tri-Cities Combined Statistical Area (TC-CSA) and (2) to estimate the extent to which the retail sector contributes to the region's economic base. The TC- CSA as defined by the U.S. Census Bureau consists of the Kingsport-Bristol and Johnson City metro areas. This market area includes Carter, Hawkins, Sullivan, Unicoi, and Washington counties in Tennessee; Virginia locations include Bristol city and Scott and Washington counties.

The retail sector is often the largest non-basic industry in any regional economy. This is certainly true for the TC-CSA as employment in the retail sector accounts for 13 percent of total employment. However, retail has been described as a *zero-sum game* in which gains by one retailer tend to be offset by losses among other, competing retailers, with no net benefit to the local economy. This view holds that retail trade is supported by the economic base of a region but contributes little to the expansion of the economic base.

The tendency for competition among retailers to be a zero-sum game is lessened by *import substitution* and *nonresident spending*. New retail development may induce residents to forego some of the shopping they previously did online or in stores outside the TC-CSA (import substitution). By the same token, the new retail stores may draw shoppers from outside the region, and in doing so, increase the customer base. Attracting shoppers from outside the region is especially critical if new retail development is to add to the region's economic base.

We define firms or industries that produce goods and services for sale to customers outside the TC-CSA as *basic industries*. These (exporting) industries bring income and employment into the region that would otherwise not exist. These firms constitute the region's *economic base*. Basic industries normally include manufacturing, mining, warehousing, medical centers, company headquarters, tourism, and state or federal facilities like universities, prisons, and military bases. Firms or industries that support basic industries by providing services or inputs, and firms that provide goods and services to households in the region are called *non-basic industries.*

Factors Affecting Retail Sales

The primary factors affecting retail sales are population, per capita income, sales to nonresidents and residents' spending at stores outside the region, including online purchases. We define the

difference between sales to nonresidents and residents' spending at stores outside the region as *net export sales*. We have direct measures of population and per capita income (Tables 1 and 2). We present an indirect measure of net export sales (Table 3).

Table 1 shows population and per capita real incomes for the TC-CSA and the United States for 2010-16. During this post-recession period, the U. S. population rose 4.5 percent while there was a slight decline in the TC-CSA population, and the increase in TC-CSA per capita real income was less than one-half the increase for the U.S. With no population growth, the health of the retail sector in the TC-CSA, as measured by sales, is wholly dependent on residents' incomes and purchases by nonresidents. Slow growth in TC-CSA per capita real income amplifies the importance of nonresidents' purchases to the health of the local retail sector.

Table 1	Population		Per Capita Income (2016 dollars)	
Year	TC-CSA	U.S. (million)	TC-CSA	U.S.
2010	508,557	309.3	35,504	44,401
2011	508,875	311.7	36,532	45,372
2012	509,366	314.1	37,068	46,311
2013	508,754	316.2	36,074	45,827
2014	507,871	318.6	36,308	47,082
2015	507,322	320.9	37,254	48,704
2016	507,995	323.1	37,363	49,571
	Percent change from 2010 to 2016			
	-0.1	4.5	5.2	10.9
Data source: Bureau of Economic Analysis (BEA), U.S. Department of Commerce				

Table 2 presents data on retail sales and total personal income for the TC-CSA and the U.S. for the 2010-16 period. Retail sales are defined as combined "retail and food service "sales. Nationally, retail sales accounted for 88.1 percent of the combined total in 2016. Total personal income is calculated as per capita income times population. Changes in total personal income reflect changes in both per capita income and population. The values are in nominal dollars as our interest is the ratio of retail sales to total personal income (RS/TPI).

TC-CSA retail sales as a percent of total personal income (RS/TPI) rose each year from 2012 through 2016, the last year for which complete annual data are available. There has been little change in the RS/TPI ratio for the United States over the same time period. In 2016, TC-CSA residents spent 41.6 percent of their total personal income on retail purchases, compared to 34.4 percent for the U.S.

Over the post-recession period, 2010 – 2016, retail sales in the U.S. rose 28.9 percent about matching the 28.4 percent increase in total personal income. Meanwhile, retail sales in the TC-CSA rose 20.1 percent, well above the 15.7 percent increase in total personal income. These data alone suggest that retail sales in the TC-CSA are receiving a boost from nonresident spending. In the next section, we present a statistical technique to measure nonresident spending.

Table 2	TC-CSA			United States		
Year	Retail Sales (RS)	Total Personal Income (TPI)	RS/TPI	Retail Sales (RS)	Total Personal Income (TPI)	RS/TPI
2010	6,583	16,405	0.401	4,285,782	12,477,100	0.343
2011	6,977	17,423	0.400	4,597,569	13,254,500	0.347
2012	7,091	18,062	0.393	4,826,390	13,915,100	0.347
2013	7,059	17,813	0.396	5,001,242	14,073,700	0.355
2014	7,280	18,189	0.400	5,211,542	14,809,700	0.352
2015	7,649	18,665	0.410	5,330,044	15,458,500	0.345
2016	7,905	18,980	0.416	5,522,929	16,016,390	0.345
	Percent change from 2010 to 2016					
	20.1	15.7	NA	28.9	28.4	NA

TPI and RS are in millions of dollars. Data sources: Total personal Income: Bureau of Economic Analysis (BEA), U.S. Department of Commerce. Retail sales: United States - U. S. Bureau of the Census, *Monthly and Annual Retail Trade*, December 2017; TC-CSA - *Tri-Cities Retail Sales Reports* published by the ETSU Bureau of Business and Economic Research - http://faculty.etsu.edu/hipples/RS16q4.htm.

Location Quotient

We use the Location Quotient (LQ) statistic to estimate the portion of retail sales in a local economy that is attributable to purchases by nonresidents. The LQ for the TC-CSA retail sector is computed as follows: LQ = TC-CSA (RS/TPI) / U.S. (RS/TPI).

This technique is based on the assumption that TC-CSA residents have the same pattern of preferences for goods and services as the aggregate of U.S. residents. A location quotient greater than 1.0 means retail accounts for a greater share of total personal income in the TC-CSA than is the case for the U.S. Therefore, a LQ greater than 1.0 indicates that some portion of retail sales occurring in the TC-CSA is to satisfy nonresidents' purchases (export sales).

The LQ for the retail sector in the TC-CSA in 2016 was (0.416 / 0.345), or 1.207. The share of retail sales in 2016 attributable to nonresidents (export sales) is calculated as follows:
Export sales share = 1.0 – (1.0/LQ) = 1 – (1/1.207) = 0.1715, or 17.15 percent.

Table 3 shows the LQ's for 2010-2016, the associated (net) export sales share and exports in dollars. The LQ value has increased considerably since 2013 and the estimated dollar value of TC-CSA retail sales attributable to purchases by nonresidents has risen from $729 million to $1,356 million.

We developed a statistical model to test our hypothesis that total personal income (TPI) and the LQ coefficient are the main factors in determining dollar retail sales (RS) in the TC-CSA. Multiple regression analysis of the 2010 – 16 period gave the following equation:
RS = -5,274 + 3,893LQ + .445TPI.
This equation explains 98.4 percent of the year-to-year variation in retail sales over the 2010-16 period, leaving only 1.6 percent explained by other factors and statistical error.

Table 3	TC-CSA Location Quotient and Net Export Sales		
Year	Location Quotient	Net Export Sales (percent of total sales)	Net Export Sales (million dollars)
2010	1.168	14.40	948
2011	1.155	13.38	934
2012	1.132	11.65	826
2013	1.115	10.33	729
2014	1.137	12.08	879
2015	1.189	15.87	1,214
2016	1.207	17.15	1,356

Economic Impact of Export Sales

Several steps are required to estimate retail's contribution to the TC-CSA economic base. First, we need to estimate the share of retail sales attributable to nonresidents. The share of total retail sales in 2016 attributable to nonresidents (export sales) is estimated at $1,356 million (Table 3). This estimate includes sales by retail and food services establishments. Nationally, retail sales accounted for 88.1 percent of the combined total in 2016. Therefore, we use $6,964 million (0.881 x $7,905 million) as our estimated retail sales figure for the TC-CSA for 2016. Estimated export sales are 0.881 times $1,356, or $1,195 million. **Note: We measure the economic impact of retail sales only: we do not have all the information needed to estimate the economic impact of food services sales to nonresidents.**

Estimating the economic impact of a change in retail sales on earnings and employment requires some care. The appropriate measure to use is *margined* sales rather than total retail sales. The economic impact of new retail sales is considerably smaller when the products are sold, but not manufactured in the region nor shipped by firms located in the in the region. This is normally the case for the TC-CSA. The retail gross margin is defined as sales receipts less the cost of goods sold. These costs include the cost of goods purchased from manufacturers and the cost of transporting these goods to retailers in the TC-CSA. Retailers depend on gross margins to pay employees, purchase inputs from other businesses in the region, and earn a profit.

The average retail gross margin for the United States is 27-28 percent of sales according to the U.S. Census Bureau, although it varies considerably from one type of retail establishment to another, ranging from less than 20 to nearly 50 percent. We use a gross margin of 35 percent in our analysis. This is near the middle of the range and we believe more representative of the types of stores comprising new retail development in the TC-CSA. We estimate margined export sales at $418 million in 2016, that is, $1,195 million x 0.35.

We define the economic impact of retail as the net change in the region's economic base that can be attributed to the sector, that is, to net export sales. The net change in the economic base depends heavily on margined export sales - new revenues brought into the region via sales to nonresidents.

Economic Impact Multipliers

The Bureau of Economic Analysis (BEA) in the US Department of Commerce makes employment and earnings multipliers available through its Regional Input- Output Modeling System (RIMS II). These multipliers allow us to estimate the extent to which a one-time or a sustained change in economic activity will be supplied by businesses within a region and, consequently, how this change in economy

activity will affect total employment and earnings in the region. The RIMS II multipliers are based on interindustry relationships in the 2010 national input-output (I-O) accounts developed by BEA. To develop multipliers for the TC-CSA, the national I-O relationships were adjusted by BEA to reflect the industry structure and trading patterns in the region's economy.

We use the following RIMS II multipliers for the retail sector in the TC-CSA to estimate the economic impact of the retail sector in 2016:

Final demand earnings multiplier: 0.5222 … the change in total earnings of households employed in all industries for each additional dollar of margined export sales (2016 dollars).

Final demand jobs multiplier: 16.73 … the change in total employment (full-time and part- time) in all industries for an additional $1 million of margined export sales (2016 dollars).

Direct effect employment multiplier: 1.3662 … the change in total employment in all sectors for each additional job in the retail sector.

Based on the above multipliers and margined export sales of $418 million, the total economic impacts in 2016 are:

Earnings: $418 million times 0.5222 = $218 million. Earnings of households employed in all industries in the TC-CSA were $218 million higher as a result of retail purchases by nonresidents.

Jobs: 418 times 16.73 = 6,993 jobs … increase in full-time and part-time jobs in all sectors of the TC-CSA economy arising from sales to nonresidents. New jobs in the retail sector are estimated at 6,993 /1.3662 = 5,119 jobs; new jobs in the nonretail sectors total 1,874.

Conclusion

The vast majority of the $7,905 million in retail sales recorded in the Tri-Cities in 2016 were to local residents. That portion of retail trade does not produce an economic impact, *per se*. Our location quotient analysis indicated that 17.15 percent of retail sales were to nonresidents. That portion of retail trade can be considered a basic industry to the region, yielding the economic impacts noted above.

Our analysis should provide, at the least, a starting point to assess the economic impact of new retail development. The economic impact of new retail development must consider the potential for the new development to attract nonresident spending. Development which competes with existing retail stores likely will have an insignificant net impact on jobs and earnings in the region – a zero-sum game. On the other hand, new stores which are unique to the region and surrounding regions have the potential for a more significant impact.

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