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# The Contribution of the Textile and Apparel 

# Cluster to the South Carolina Economy 

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# The Contribution of the Textile and Apparel Cluster To the South Carolina Economy 

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## The Contribution of the Textile and Apparel Cluster To the South Carolina Economy

## I. Introduction

Amid the headlines of textile and apparel plant closings, there is an undercurrent of industry restructuring that suggests the emergence of a revitalized textile and apparel sector in South Carolina. In contrast to the textile and apparel industrial complex of the 1980s and 1990s, the textile and apparel cluster over the next decade is likely to have fewer low skilled laborers, and will pay higher wages and salaries in the industries that prosper. The purposes of the research report are to document the current contributions of the textile and apparel industrial cluster to the South Carolina economy, and to examine how the emerging textile and apparel cluster will impact the state economy over the next decade, if its component industries are able to compete effectively in domestic and World markets.

Methodology. The analysis in this report was undertaken in several steps.

1. Building on the 528 industry grouping of the latest U.S. interindusty model, the textile and apparel industries were sorted into traditional and emerging sectors. Trend analysis of growth and decline across these sectors for South Carolina was documented in the companion report to this document, "South Carolina's Textile and Apparel Industries: An Analysis of Trends in Traditional and Emerging Sectors, " by Eades, Barkley and Henry (2007).
2. Using the IMPLAN model for South Carolina (2006), the economic contributions that both traditional and emerging sectors have on the state economy were estimated -- both directly and through supply chain linkages.
3. The performance of South Carolina's textile and apparel industry is compared with industry trends in the North Carolina and Georgia to assess the competitiveness of South Carolina's industry in world and domestic markets. Given the competitive environment, a set of textile and apparel cluster growth targets are used to examine the contribution that the textile and apparel sectors can make to the South Carolina economy over the next decade.

## II. Industry Trends

Analysis in Eades, et al documents employment declines in South Carolina from 1990 to 2005 that are pervasive at the aggregate level for Textiles (NAICS 313), Textile Mill Products (NAICS 314) and Apparel (NAICS 315). The quarterly trends since 2004 that are displayed in Figure 1 reveal that these downward trends continued through the end of calendar year 2006.

Figure 1. Employment in the SC Textiles and Apparel Industries, 2004-2006.


Source: Local Employment Dynamics, QWI, U.S. Dept. of Commerce
With the elimination of quotas in 2005 under the Multifiber Arrangement (MFA) and the Agreement on Textiles and Clothing (ATC, see Brambilla 2007), it was expected that U.S. Textile and Apparel output would decline at even faster rates than in the previous decade. In South Carolina, this appears to be the case for the time period 2004 through the final quarter of 2006 (most recent data available from BLS) for each of the aggregate sectors as illustrated in Figure 1. Total employment in all sectors fell from 50,084 in the 2004 to about 35,691 in the third quarter of 2006 (see the Appendix for definitions of sector employment). Note that the Apparel industry (NAICS 315) is a minor part of the overall industry with only about 3700 employees at the end of 2006 (see Table 1).

## Table 1. Recent Textile and Apparel Employment Dynamics in South Carolina

Table 1. Textile and Apparel Industry Employment Dynamics in South Carolina

| Industry 313 Textile Mills |  | 2004_1 | 2005_1 | 2006_1 | 2006_2 | 2006_3 | 2006_4 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |
|  | Avg Monthly Earnings | \$2,502.00 | \$2,878.00 | \$2,743.00 | \$2,783.00 | \$2,786.00 | N/A |
|  | Job Creation | 545 | 2,114 | 3,065 | 501 | 1,002 | N/A |
|  | Net Job Flows | -1,720 | 466 | 2,112 | -1,494 | -1,508 | N/A |
|  | Total Employment | 35,520 | 31,685 | 28,044 | 30,014 | 27,769 | 26,288 |
| Industry |  | 2004_1 | 2005_1 | 2006_1 | 2006_2 | 2006_3 | 2006_4 |
|  |  |  |  |  |  |  |  |
| Product Mills | Avg Monthly Earnings | \$2,175.00 | \$2,420.00 | \$2,329.00 | \$2,492.00 | \$2,463.00 | N/A |
|  | Job Creation | 298 | 637 | 1,343 | 194 | 165 | N/A |
|  | Net Job Flows | -6 | 134 | 1,034 | -271 | -660 | N/A |
|  | Total Employment | 9,646 | 8,094 | 5,786 | 6,541 | 6,213 | 5,677 |
| Industry |  | 2004_1 | 2005_1 | 2006_1 | 2006_2 | 2006_3 | 2006_4 |
| Manufacturing | Avg Monthly Earnings | \$1,818.00 | \$1,869.00 | \$2,087.00 | \$2,156.00 | \$2,025.00 | N/A |
|  | Job Creation | 87 | 88 | 299 | 160 | 88 | N/A |
|  | Net Job Flows | -178 | -158 | 207 | 0 | -37 | N/A |
|  | Total Employment | 4,918 | 4,099 | 3,466 | 3,796 | 3,733 | 3,726 |
| Industry <br> All Textiles and Apparel |  | 2004_1 | 2005_1 | 2006_1 | 2006_2 | 2006_3 | 2006_4 |
|  | Avg Monthly Earnings | \$2,371.86 | \$2,699.26 | \$2,617.81 | \$2,676.84 | \$2,657.47 | N/A |
|  | Job Creation | 930 | 2,839 | 4,707 | 855 | 1,255 | N/A |
|  | Net Job Flows | -1,904 | 442 | 3,353 | -1,765 | -2,205 | N/A |
|  | Total Employment | 50,084 | 43,878 | 37,296 | 40,351 | 37,715 | 35,691 |

Source: Local Employment Dynamics, QWI, U.S. Dept. of Commerce.
As revealed in Table 1, there is substantial job churning (hiring and firing) within the traditional Textile and Apparel industries, and there has been a loss in net jobs over the past several years. Total Employment is the "total number of workers who were employed by the same employer in both the current and previous quarter." Job creation is the "number of new jobs that are created by either new area businesses or the expansion of employment by existing firms." Finally, Net Job Flows is "the difference between current and previous employment at each business." For more information see: http://lehd.dsd.census.gov/led/datatools/qwi-online.html Each of these measures of local employment dynamics gives a feel for which industries are hiring and firing as well as monthly earnings trends. For our purposes, it is useful to note the following trends:

1. Stable employment by individuals in firms that comprise the traditional textile and apparel industries has declined over the past several years. Total employment has declined steadily from 50,084 in the first quarter 2004 to 37,296 in the first quarter of 2006.
2. Quarterly trends since quarter one of 2006 suggest negative Net Job flows in the past year.
3. However, comparing first quarter results for 2004, 2005, and 2006, there are signs of "life" in the industry. Net Job Flows changed from a loss of 1,904 in the first quarter 2004 to a gain of 3,353 in quarter one, 2006. First quarter results for 2007 should provide evidence on whether or not this is a "seasonal" bump or more encouraging trend in employment in the industry.

## The South Carolina Textile and Apparel Cluster (TAC)

The importance of the individual industries that comprise the Textile and Apparel industrial complex has changed over the past decade. Some of these industries have done well while others have experienced severe contractions in sales and employment. By examining the supply chain linkages in this industrial complex, it is possible to depict a more complete picture of the nature and performance of the set of industries with textiles and apparel at its core. In this report, sixteen industries comprise the Textile and Apparel Cluster (TAC) in South Carolina. Industries in the TAC are:
Traditional Textiles and Apparel industries:

1. NAICS 313 Textile Mills
2. NAICS 314 Textile Mill Products
3. NAICS 315 Apparel

Key raw material suppliers and equipment:
4. NAICS 111920 Cotton Farms
5. NAICS 115111 Cotton Gins
6. NAICS 325222 Noncellulosic Organic Fiber Manufacturing
7. NAICS 325221 Cellulosic Organic Fiber Manufacturing
8. NAICS 325131 Inorganic Dye and Pigment Manufacturing
9. NAICS 325132 Synthetic Organic Dye and Pigment Manufacturing
10. NAICS 333292 Textile Machinery

Wholesaling (margin activities only):
11. NAICS 424310 Piece Goods, Notions, and Other Dry Goods Merchant Wholesalers
12. NAICS 423220 Home Furnishings Merchant Wholesalers
13. NAICS 424320 Men's and Boys' Clothing and Furnishings Merchant Wholesalers
14. NAICS 424330 Women's, Children's, and Infants' Clothing and Accessories Merchant Wholesalers and,
Emerging producers of textile/fiber products:
15. NAICS 339113 Surgical Appliances and Supplies Manufacturing
16. NAICS 336360 Motor Vehicle Seating and Interior Manufacturing
III. Contributions of the Textile and Apparel Cluster to the SC Economy, 2006

To estimate the contributions to the SC economy made by the TAC, we proceed as follows. First, sales by each of the 16 TAC industries to all other industries in South Carolina (interindustry sales) and to final users (consumers, investment, government, and
exports) are obtained from the IMPLAN model and database for 2006 with some adjustments for the six digit NAICS industries using the Harris 2007 data for SC establishments. To avoid double counting, only sales to final users are counted as the "driving force" behind the total contributions that the TAC makes to the SC economy.

In Table 2, we document the current (2006) total sales and total sales to final demand (investment, government and exports) for each of the TAC industries. The final demand sales do not include sales to SC consumers ${ }^{1}$ or to SC businesses that use TAC products. Instead, these impacts are captured during the supply chain rounds of spending (direct and indirect) and in household income induced rounds of spending.

| TABLE 2. SOUTH CAROLINA SALES: TEXTILES APPAREL INDUSTRIAL CLUSTER (TAC) | TOTAL <br> SALES IN 2006 millions of dollars | FINAL DEMAND SALES IN 2006^ millions of dollars |
| :---: | :---: | :---: |
| Traditional Textiles and Apparel industries: |  |  |
| 1. NAICS 313 Textile Mills (EXC 313230, 313320) | \$5,448.260 | \$4,996.372 |
| 313230 Nonwoven fabric mills | \$557.865 | \$520.824 |
| 313320 Fabric coating mills | \$154.192 | \$144.732 |
| 2. NAICS 314 Textile Mill Products (EXC 31491, 31499, 31499) | \$1,370.496 | \$1,345.770 |
| 31491 Textile bag and canvas mills | \$68.776 | \$67.099 |
| 31499 Tire cord and tire fabric mills | \$23.520 | \$22.863 |
| 31499 Other miscellaneous textile product mills | \$219.316 | \$216.063 |
| 3. NAICS 315 Apparel | \$522.109 | \$271.648 |
| Traditional Textiles and Apparel industries SUBTOTAL: | \$8,364.533 | \$7,585.370 |
| Key raw material suppliers and equipment: |  |  |
| 4. NAICS 111920 Cotton Farms | \$97.650 | \$91.370 |
| 5. NAICS 115111 Cotton Gins | \$218.596 | \$1.138 |
| 6. NAICS 325222 Noncellulosic Organic Fiber Manufacturing | \$3,575.349 | \$3,300.080 |
| 7. NAICS 325221 Cellulosic Organic Fiber Manufacturing | \$251.977 | \$251.322 |
| 8. NAICS 325131 Inorganic Dye and Pigment Manufacturing | \$993.925 | \$754.083 |
| 9. NAICS 325132 Synthetic Organic Dye and Pigment Manufacturing | \$703.462 | \$507.244 |
| 10. NAICS 333292 Textile Machinery | \$165.906 | \$150.073 |
| Key raw material suppliers and equipment SUBTOTAL: | \$6,006.866 | \$5,055.311 |
| Wholesaling (margin activities only): |  |  |
| 11. NAICS 424310 Piece Goods, Notions, and Other Dry Goods Merchant Wholesalers |  |  |
| 12. NAICS 423220 Home Furnishings Merchant Wholesalers |  |  |
| 13. NAICS 424320 Men's and Boys' Clothing and Furnishings Merchant Wholesalers |  |  |
| 14. NAICS 424330 Women's, Children's, and Infants' Clothing and Accessories Merchant Wholesalers SUBTOTAL: | \$385.073 | \$385.073 |
| Selected emerging producers of textile/fiber products |  |  |
| 15. NAICS 339113 Surgical Appliances and Supplies Manufacturing | \$208.496 | \$208.496 |
| 16. NAICS 336360 Motor Vehicle Seating and Interior Manufacturing | \$81.177 | \$81.177 |
| Selected emerging producers of textile/fiber products | \$289.673 | \$289.673 |
| TOTALS: | \$15,046.144 | \$13,315.426 |

In 2006, the TAC industries accounted for $\$ 15.046$ billion in total gross sales with $\$ 13.315$ billion in final demand sales to exports, government and investment. These final demand sales represent "basic" sales by this industry that generate the need for added production in the TAC supply chain that enables the TAC sectors to make their deliveries

[^0]to final users of their goods and services. The final demand sales also begin a process that generates added income for SC households as they earn wages, salaries and profits from the final demand sales and from the supply chain sales. This added household income induces consumption of goods and services in other industries in SC.

As shown in Table 3, TAC final demand sales of $\$ 13.315$ billion in 2006 resulted in total sales in all SC industries of $\$ 21.196$ billion, total value added (approximately equivalent to income accruing to SC households) of $\$ 7.824$ billion and 113,258 jobs in SC establishments. Impacts on approximately 80 industries in South Carolina are listed in the Appendix.


Source: IMPLAN 2006 for SC totals; IMPLAN estimates by the authors for TAC totals
The TAC accounted for almost $5 \%$ of the total jobs in South Carolina in 2006. Gross sales were about $8.4 \%$ of the SC total and Value Added from TAC activities was about $6 \%$ of the SC total in 2006. These results are consistent with trends documented in Eades, et al that generally reveal a declining TAC employment base in South Carolina even as TAC earnings per worker increase over time. This combination of declining employment with higher levels of earnings (and output) per worker is likely to continue over the next decade as the next section in this report suggests.

The underlying shifts from lower skill jobs in Apparel to higher skill (and more output per employee) jobs in other components of the TAC are attributable to several economic and institutional factors. First, the low skill jobs are and have been better suited for low skill/low wage labor overseas. The phased elimination of quotas under the Agreement on Textiles and Clothing (ATC) in 2005, with exceptions for China until the end of 2008, has accelerated the declining share of U.S. products in the market for a variety of TAC goods (see Brambilla, et al 2007 for analysis of the impacts of the ATC on imports to the U.S.). The effects of quota elimination have been most dramatically revealed in the decline of Apparel jobs as illustrated below.

## IV. How Competitive Is the South Carolina Textile and Apparel Cluster?

## World Exports by the Traditional Textile/Apparel Industry in SC.

One indicator of the future vitality of the TAC, and its potential to expand on its 2006 contribution to the SC economy, is its ability to compete with other states for textile and apparel products in World export markets. Table 3 provides evidence that SC has competed effectively in NAICS 313 Textiles and Fabrics, maintaining its rank as the number 5 state in exports from 2001 to 2006 -- even increasing the nominal value of exports over that time period. However, SC has become less competitive in NAICS 314 and 315 -- both industries in SC saw declines in exports and in rank among the states.

Table 3. South Carolina's Place in the Domestic Competition for World Export Markets

| Exports of 313 TEXTILES \& FABRICS to World in thousands (\$ USD) |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | State | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
| 2001 Position | 2006 Position | U.S. Total | 7,365,202 | 7,642,419 | 7,805,386 | 8,637,711 | 8,755,874 | 8,780,734 |
| 2 | 1 | North Carolina | 1,204,686 | 1,297,029 | 1,375,877 | 1,590,554 | 1,719,594 | 1,841,198 |
| 1 | 2 | Texas | 1,364,129 | 1,402,166 | 1,412,689 | 1,353,280 | 1,323,932 | 1,250,258 |
| 3 | 3 | California | 553,743 | 613,775 | 650,306 | 726,848 | 743,329 | 688,799 |
| 6 | 4 | Georgia | 406,553 | 467,121 | 480,070 | 653,360 | 705,568 | 644,586 |
| 5 | 5 | South Carolina | 507,761 | 458,917 | 482,813 | 570,652 | 590,025 | 537,530 |
| 4 | 6 | Florida | 534,902 | 673,519 | 626,071 | 703,257 | 509,016 | 492,925 |
| 11 | 7 | Tennessee | 152,578 | 141,497 | 215,629 | 266,165 | 316,894 | 365,564 |
| 10 |  | Virginia | 157,584 | 201,777 | 244,612 | 266,209 | 342,288 | 349,499 |
| 8 |  | Alabama | 260,672 | 204,855 | 197,445 | 262,625 | 261,921 | 259,930 |
| 7 |  | New York | 382,011 | 328,425 | 309,557 | 292,557 | 234,407 | 241,572 |


| Exports of 314 TEXTILE MILL PRODUCTS to World in thousands (\$ USD) |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | State | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
| 2001 Position | 2006 Position | U.S. Total | 2,082,822 | 1,981,581 | 2,004,488 | 2,235,407 | 2,545,808 | 2,783,642 |
| 1 | 1 | Georgia | 422,267 | 363,980 | 367,853 | 406,727 | 465,621 | 531,302 |
| 2 | 2 | Texas | 196,417 | 179,407 | 170,897 | 215,199 | 290,281 | 307,760 |
| 3 | 3 | California | 152,873 | 150,434 | 156,713 | 166,700 | 174,504 | 187,802 |
| 4 | 4 | North Carolina | 152,338 | 146,591 | 129,555 | 126,035 | 121,521 | 140,884 |
| 5 | 5 | New York | 106,245 | 89,305 | 89,162 | 111,900 | 115,843 | 120,231 |
| 13 | 6 | Michigan | 43,625 | 45,178 | 36,025 | 71,377 | 108,774 | 112,438 |
| 9 | 7 | Florida | 78,108 | 76,323 | 76,317 | 90,451 | 86,707 | 104,377 |
| 8 | 8 | Virginia | 86,879 | 90,926 | 75,920 | 76,673 | 83,108 | 97,769 |
| 7 |  | Pennsylvania | 90,430 | 92,732 | 75,047 | 77,457 | 86,655 | 80,502 |
| 12 | 10 | Ohio | 55,188 | 46,735 | 48,033 | 55,902 | 64,540 | 71,549 |
| 6 |  | South Carolina | 98,659 | 92,011 | 81,444 | 79,790 | 65,093 | 61,665 |


| Exports of 315 APPAREL \& ACCESSORIES to World in thousands (\$ USD) |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | State | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
| 2001 Position 2006 Position | n U.S. Total | 6,956,292 | 5,994,072 | 5,469,699 | 4,962,129 | 4,899,135 | 4,776,411 |
| 2 | 1 California | 1,119,929 | 1,115,637 | 1,040,461 | 1,042,854 | 1,234,191 | 1,280,841 |
| 1 | 2 North Carolina | 1,241,958 | 1,153,768 | 1,118,984 | 1,005,365 | 808,166 | 757,165 |
| 5 | 3 New York | 423,069 | 347,691 | 309,590 | 333,512 | 412,760 | 452,233 |
| 3 | 4 Texas | 771,445 | 735,839 | 504,970 | 427,007 | 482,735 | 417,894 |
| 6 | 5 Alabama | 321,126 | 306,365 | 489,341 | 363,576 | 303,336 | 252,482 |
| 11 | 6 Puerto Rico | 153,231 | 199,528 | 204,361 | 245,084 | 259,485 | 221,488 |
| 4 | 7 Florida | 703,602 | 431,421 | 363,739 | 283,173 | 216,424 | 178,741 |
| 14 | 8 New Jersey | 107,918 | 87,595 | 80,747 | 96,242 | 113,421 | 141,990 |
| 23 | 9 Massachusetts | 30,676 | 21,608 | 20,613 | 19,673 | 24,491 | 84,987 |
| 1010 | 10 Pennsylvania | 198,100 | 168,024 | 137,404 | 88,592 | 92,330 | 79,888 |
| 71 | 14 South Carolina | 272,761 | 149,518 | 120,968 | 89,754 | 93,440 | 53,897 |
| Source: U.S.Office of Textiles and Apparel (OTEXA) |  |  |  |  |  |  |  |

Trends in Table 3 for neighboring states, NC and Georgia, show that SC has lost world export share to its neighbors in each of the three traditional components of the TAC. ${ }^{2}$ In the Textile and Fabrics industry (313), NC now ranks first in the nation in value of export

[^1]sales and has managed to increase the nominal value of its exports on the World market from $\$ 1.2$ billion in 2001 to $\$ 1.8$ billion in 2006. Georgia also increased its exports from $\$ 406$ million to $\$ 645$ million from 2001 to 2006, while SC exports remained flat increasing slightly in nominal values from $\$ 507$ million in 2001 to $\$ 534$ million in 2006.

In the Textile Mill Products industry (NAICS 314), SC fell from number 6 to number 14 in state ranking from 2001 to 2006. While Textile Mill Products account for a much smaller volume of exports than NAICS 313 (and NAICS 315), a striking finding from Table 3 is the ability of Georgia producers in NAICS 314 to expand exports from $\$ 422$ million in 2001 to $\$ 531$ million in 2006. Moreover, South Carolina's volume of exports fell from $\$ 98$ million in 2001 to $\$ 61$ million in 2006 while World Exports from North Carolina fell modestly from \$152 million in 2001 to \$141 million in 2006.

Similarly, SC fell from a number 7 ranking among states in 2001 to number 14 in 2006 for Apparel exports (NAICS 315). Exports of apparel and accessories (NAICS 315) from SC decreased from $\$ 272$ million in 2001 to $\$ 54$ million in 2006. While Georgia is not a top ten state in this industry, NC is the number 2 producer despite substantial reductions in exports from $\$ 1.2$ billion in 2001 to $\$ 757$ million in 2006.

Since NC, Georgia and SC are close competitors in terms of industry legacies, workforce characteristics and geographical setting, one might assume that establishments in Georgia, North Carolina and SC would be similar in their abilities to compete on World export markets. However, it appears that establishments in NC and Georgia have been a bit more successful than those in SC in protecting their export markets in NAICS 313 and 314 (Textiles and Apparel and Textile Mill Products). Even in NAICS 315 (Apparel) North Carolina has managed a slower pace of downsizing export sales than South Carolina. What mix of establishments and industry innovations has enabled NC and Georgia to out-compete SC in World export markets? These are open questions but answers to them could provide insights into options for improving the competitiveness of the TAC in South Carolina over the next decade.

Figure 2. Value of Product Shipments 1997, 2002, and 2005: NAICS 313 Textile Mills


Source: Census of Manufactures, 1997, 2002; Annual Survey of Manufactures, 2005
Domestic and World Markets. The relatively lackluster World export performance of the SC TAC may reflect a SC industry focus on domestic markets. To evaluate this possibility, we examine trends for both domestic sales and export sales together.

Textile Mills. All three states had a decline in nominal value of shipments in NAICS 313 from 1997 to 2005, as shown in Figure 2. Despite its expanding value of World exports, NC total shipments fell from about $\$ 17$ billion in 1997 to around $\$ 9$ billion in 2005 while SC shipments fell from $\$ 10$ billion in 1997 to just under $\$ 6$ billion in 2005. In contrast to NC and SC, Georgia managed a small increase in the value of shipments from 2002 to 2005.

Figure 3. Value of Product Shipments 1997, 2002, and 2005: NAICS 313 Textile Mills, Components


Source: Census of Manufactures, 1997, 2002; Annual Survey of Manufactures, 2005

Within the 313 industry group are several sub sectors of interest that can help clarify the relative strengths and weaknesses of the SC Textile Mills industry. These subsector results are displayed in Figure 3. Sector 3131, Fiber, Yarn and Thread Mills is the source of expansion for Georgia. In contrast, SC shipments are dominated by Fabric Mills, NAICS 3132. NAICS 31321 (Broadwoven Fabric Mills), NAICS 31323 (Nonwoven Fabric Mills) and NAICS 31324 (Knit Fabric Mills) are the major subsectors in Fabric Mills with Nonwoven fabrics exhibiting the most potential for growth in SC (Eades, et al, 2007). Fabric finishing and coating (NAICS 3133) play the smallest role in value of shipments for the Textile Mills sector (NAICS 313) in each of state, with Georgia least reliant on this subsector. While SC had higher levels of Textile Mills output in 1997 and 2002 than Georgia, it has now fallen behind both Georgia and NC in NAICS 313 shipments.

Figure 4. Value of Product Shipments 1997, 2002, and 2005: NAICS 314 Textile Product Mills


Source: Census of Manufactures, 1997, 2002; Annual Survey of Manufactures, 2005
Textile Mill Products. Turning next to NAICS 314, Figure 4 shows a stable level of shipments for SC and NC of about $\$ 2$ billion from 1997 to 2005. Complementing the results displayed for World exports of Textile Mill products in Table 3, Georgia dominates the region in NAICS 314 sales with expanding shipments from just over \$10 billion in 1997 to over $\$ 14$ billion in 2005.

The subsector results for NAICS 314 are displayed in Figure 5. With just over $\$ 14$ billion in NAICS 314 shipments in 2005, Georgia plants are far outpacing sales of textile mill products made by establishments in SC and NC with Textile Furnishing Mills (NAICS 3141) as the dominant subsector. This success in textile furnishing mills is a favorite early story of the power of clusters of economic activity - in this case the role of carpet manufacturing cluster in the Dalton area of north Georgia (Krugman, 1991). It is important to recognize the staying power of this cluster in Georgia despite the intensification of foreign competition since the 1990s. Other Textile Mill Products (NAICS 3149) play a small role in the sector across all three states with sales less than about $\$ 1$ billion in 2005.

Figure 5. Value of Product Shipments 1997, 2002, and 2005: NAICS 314 Textile Product Mills, Components


Source: Census of Manufactures, 1997, 2002; Annual Survey of Manufactures, 2005

For Industry 314, Eades, et al find that value added estimates at the national level indicate a more economically stable industry than for SC employment and earnings in Carpet and Rugs Mills (31411) and Textile Bag and Canvas Mills (31491) industries. The impressive growth in the nominal value of shipments of the Carpet and Rugs Mills (31411) in Georgia suggests that this component of the textile industry is alive and well. Although the impact of housing building cycles on the demand for carpets and rugs is a problem for this sector, SC leaders in the TAC should be examining strategies for expanding their role in the supply chain for this regional growth center in the textile industry.

Apparel Manufacturing Finally, the value of shipments in NAICS 315 is shown in Figure 6 and decomposed into three subsectors in Figure 7. It is evident from Figures 6 and 7 that the apparel industry in SC has contracted substantially since 1997 with little activity in the cut and sew subsector, NAICS 3152. Georgia has experienced similar dramatic reductions in Apparel shipments. Only NC has maintained a sizeable industry in 2005 with almost $\$ 4$ billion in shipments, albeit about half its size in 1997. Even in this smaller industry in 2005, NC maintained its 2002 sales level in 2005 for the Apparel Knitting Mills subsector (NAICS 3151).

Figure 6. Value of Product Shipments 1997, 2002, and 2005: NAICS 315 Apparel


Source: Census of Manufactures, 1997, 2002; Annual Survey of Manufactures, 2005

Figure 7. Value of Product Shipments 1997, 2002, and 2005: NAICS 315 Apparel Manufacturing, Components


Source: Census of Manufactures, 1997, 2002; Annual Survey of Manufactures, 2005

Figure 8. Value of Product Shipments 1997, 2000, and 2005: NAICS 315 Apparel Manufacturing


Source: Census of Manufactures, 1997, 2002; Annual Survey of Manufactures, 2005
Finally, as revealed in Figure 8, SC and GA apparel shipments in 2005 were 20\% to 25\% of 1997 levels. In contrast, the apparel industry in NC has declined less rapidly than the U.S. maintaining about $55 \%$ of its 1997 levels of shipments of apparel products in 2002.

Sector strengths and weaknesses in the Textiles and Apparel Cluster. Eades, et al find several subsectors of the Textile and Apparel industries in South Carolina that showed strength from 2000 to 2005. Five of the state's seven sectors in the Textile Mill industry (NAICS 313) follow the industry-wide trends of significantly declining employment and earnings for the post 1990 period. Nonwoven Fabric Mills (NAICS 31323) and Fabric Coating Mills (NAICS 31332), however, have been relatively prosperous in the state. Earnings, employment, and establishment numbers exhibited a positive trend for the Nonwoven Fabric Mills industry in South Carolina. At the national level, value added in Nonwoven Fabrics increased by more than 50\% since 1997 providing further evidence of an expanding industry.

Fabric Coating Mills (NAICS 31332) in South Carolina reported increasing establishment numbers and relatively stable real earnings and employment for the last 10 years. At the national level, however, employment and value added in Fabric Coating Mills declined by approximately $20 \%$ since 1997. Thus, the state's Fabric Coating Mills industry has remained relatively stable in the face of a national industry decline. For Industry 314, Eades, et al find that value added estimates at the national level indicate a more economically stable industry than do state employment and earnings statistics in the Carpet and Rugs Mills (31411) and Textile Bag and Canvas Mills (31491) industries.

Finally, at the national level, all seven five-digit industries in the Apparel industry (NAICS 315) exhibited significant declines in employment, earnings, and value added from 1990 to 2005. In South Carolina, employment losses for the period generally exceeded $80 \%$.

## Selected Subsectors of the Textile and Apparel Cluster

The Location Quotient (LQ) (state industry employment share/national industry employment share) and relative employment growth rate (RGR) (state industry growth/national industry growth) analysis in Eades, et al identify five textile and apparel industries and five support industries as relatively promising candidates for dynamic clusters based on the state's comparative employment shares and growth rates. The selected industries are:

NAICS 31321 Broadwoven Fabric Mills
NAICS 31323 Nonwoven Fabric Mills
NAICS 31324 Knit Fabric Mills
NAICS 31332 Fabric Coating Mills
NAICS $31511 \quad$ Hosiery and Sock Mills
NAICS 32513 Synthetic Dye and Pigment Manufacturing
NAICS $336360 \quad$ Motor Vehicle Seating and Interior Manufacturing
NAICS 339113 Surgical Appliances and Supplies Manufacturing
NAICS 423220 Home Furnishing Merchant Wholesalers
NAICS 423330 Women's, Children's, and Infants' Clothing and Accessories Merchant Wholesalers

Industry Growth. The above 10 industries contain both growing and declining sectors in terms of recent production output and employment opportunities. Of principal interest to this study are the sectors with the greatest growth potential as indicated by 2000 to 2005 changes in state employment, national employment, or national value added. Three of the 10 industries exhibited positive growth in value added at the national level (31323, 32513,339113 ), one of the ten reported 2000 to 2005 employment growth in the state and nationally (423220), and two of the ten experienced 2000 to 2005 employment growth in the state but not for the nation as a whole ( 336360,424330 ). In sum, six state industries exhibited both a relative competitive advantage (high LQ and RGR) and the potential for future growth (positive trends in national value added, state employment, or national employment).

These six sectors are:
31323 Nonwoven Fabric Mills
32513 Synthetic Dye and Pigment Manufacturing
336360 Motor Vehicle Seating and Interior Manufacturing
339113 Surgical Appliances and Supplies Manufacturing
423220 Home Furnishing Merchant Wholesalers
424330 Women's, Children's, and Infants' Clothing and Accessories Merchant Wholesalers

The remaining four candidates for cluster promotion (Broadwoven Fabric Mills (31321), Knit Fabric Mills (31324), Hosiery and Sock Mills (31511) and Fabric Coating Mills (31324)) are well represented in the state, but recent employment and production trends are negative. At the national level, the 2000 to 2005 decline in total output (as indicated by value added) ranged from $-19 \%$ to $-41 \%$ and the decline in employment ranged from $-27 \%$ to $-52 \%$ for the four textile and apparel sectors.

The fortunes of three parts of the TAC are illustrated in Figures 9, 10 and 11. The traditional textile and apparel industries, NAICS 313, 314 and 315, have each shed employees steadily since 2004 (see Figure 9). Moreover, supply chain employment in textile related chemicals (NAICS 325222 Noncellulosic Organic Fiber Manufacturing, NAICS 325221 Cellulosic Organic Fiber Manufacturing, NAICS 325131 Inorganic Dye and Pigment Manufacturing and NAICS 325132 Synthetic Organic Dye and Pigment Manufacturing) has been relatively stable since 2004. However, employment has declined from about 15,000 in 2004 to about 12,000 employees at the end of 2006 (see Figure 10).

In contrast, SC employment in TAC related warehousing and wholesaling activities have shown a steady increase in employment since early 2004 as shown in Figure 11. This increase has been a result of the strong employment performance in NAICS 423220 (Home Furnishing Merchant Wholesalers). In the aggregate, employment in NAICS 424330 (Women's, Children's, and Infants' Clothing and Accessories Merchant Wholesalers), NAICS 424310 Piece Goods, Notions, and Other Dry Goods Merchant Wholesalers, and NAICS 424320 Men's and Boys' Clothing and Furnishings Merchant Wholesalers trended downward from the first quarter in 2004 to the beginning of 2006.

Figure 9. SC Traditional Textile/Apparel Employment


Figure 10. Selected TAC Suppliers Industries' Employment


Figure 11. SC Textile/Apparel Related Product Wholesalers Employment


## V. Impacts of Growth Targets for the Textile and Apparel Cluster

Over the next decade, the TAC industries will continue to be faced with an array of challenges from both foreign imports and other states with important textile and apparel industries. We have demonstrated in earlier sections and in Eades, et al that South Carolina has a mixed bag of growing and declining components in the Textile and Apparel Cluster. It is beyond the scope of this report to provide econometric estimates of future levels of shipments by the industries that comprise the TAC in South Carolina. As a pragmatic alternative, we define a set of growth targets for industry shipments to final users for each of the major components of the Textile and Apparel cluster over the next decade. Using the nomenclature in Cassill, et al 2007, there are subsectors and their constituent establishments that are: "Flourishing" "Coping" or "Potentially Vulnerable"."

[^2]Apparel companies in South Carolina appear to be the most vulnerable to further decline. The survivors in this sector may be those that can emulate the quick responsiveness to changing consumer tastes that 'lean retailing' requires, like companies in the fashion centers of New York and Los Angeles. As suggested in the trends in Figure 12, standard products from low cost "cut and sew" establishments will be hard pressed to compete with imports, especially after the lifting of temporary quotas on Chinese goods at the end of 2008. Accordingly, we assume that real value of apparel shipments trends will continue over the next decade so that NAICS 315 industries in SC will fall by $50 \%$ by 2016 from 2006 levels.

Figure 12. SC Establishment, Employment, and Earnings Trends 1990-2005: NAICS 31521 Cut and Sew Apparel Contractors
Source: Census of Employment and Wages (ES202), 1990-2005. MIG, Inc. 2005


Does this mean that there is an "Apparel Apocalypse" brewing in South Carolina? For the cut and sew operations, further decline seems likely. However, even after ATC quotas are lifted from China at the end of 2008, analysts expect that expanding World trade in Apparel will benefit textile companies in the U.S. For example, Abernathy and Weil (2004) note that "Much of the textiles used in garments made in Mexico and the Caribbean - and potentially from Central America - come from the United States." These "coping" textile firms in South Carolina can expand the textile supply chain, and fishbone diagram (e.g., traditional textile and apparel manufacturing efficiencies; basic/commodity product focus; limited product and market knowledge with limited product line(s))". Cassill, et al 2007 p. 76.
these gains may dominate the declining apparel sector effects in South Carolina. That is, fewer jobs in SC apparel establishments may be offset by added jobs in SC textile mill establishments that are providing supplies needed by apparel producers in Latin America and elsewhere to meet growth in demand for their exports.

Moreover, as noted above, Eades, et al identified growth opportunities across the NAICS 313 and 314 industry groups and in the supply chain. The "flourishing" firms in the industry are subsectors that have performed relatively well during the 2000-2005 period of aggregate industry decline. Specifically, South Carolina appears to have a competitive advantage relative to the U.S. in five subsectors of textile and apparel manufacturing and five supporting sectors to the industry.

## Textiles and Apparel

- Broadwoven Fabric Mills
- Nonwoven Fabric Mills
- Knit Fabric mills
- Fabric Coating Mills
- Hosiery and Sock Mills

Supporting Industries

- Synthetic Dye and Pigment Manufacturing
- Motor Vehicle Seating and Interior Manufacturing
- Surgical Appliances and Supplies Manufacturing
- Home Furnishing Wholesalers
- Women's Children's Infants' Clothing Wholesalers

To estimate the potential impacts of the TAC in 2016, we use targets for the real growth rates of shipments from 2006 to 2016 for each of the TAC industries shown in column 3 of Table 4.

Traditional Textile and Apparel Industries. "Coping" firms in NAICS 313 and 314 are targeted to expand, on average, by $25 \%$ over the decade, except for "Flourishing" firms in NAICS 31323 (Nonwoven Fabric Mills) and NAICS 31332 (Fabric Coating Mills) that target a $50 \%$ expansion of shipments to final users (primarily exports) over the ten year period. "Potentially Vulnerable" firms in NAICS 315, Apparel, are expected to see shipments decline by $50 \%$ over the decade.
Raw Material Suppliers and Equipment. No real growth in Cotton farming and ginning is assumed while "Coping" textile chemicals and fibers are targeted to grow at $25 \%$ over the period. "Potentially vulnerable" Textile machinery declines by $25 \%$ over the decade. Wholesaling. On average the four "Coping" textile and apparel wholesaling sectors are targeted to expand by $25 \%$ from 2006 to 2016.
Emerging textile sectors._ Both "Flourishing" textile related surgical devices and auto products have growth targets of $50 \%$ in real terms over the ten year period.

| TABLE 4. SOUTH CAROLINA SALES: APPAREL, TEXTILES AND FIBER TARGETED CHANGES IN FINAL DEMAND SALES | FINAL DEMAND SALES IN 2006^ millions of dollars | FINAL DEM SALES IN millions of dollars | MAND 2016^ |
| :---: | :---: | :---: | :---: |
| Traditional Textiles and Apparel industries: |  | GROWTH | LEVELS |
| 1. NAICS 313 Textile Mills (EXC 313230,313320) | \$4,996.372 | 25\% | \$6,245.465 |
| 313230 Nonwoven fabric mills | \$520.824 | 50\% | \$781.236 |
| 313320 Fabric coating mills | \$144.732 | 50\% | \$217.098 |
| 2. NAICS 314 Textile Mill Products (EXC 31491,31499,31499) | \$1,345.770 | 25\% | \$1,682.213 |
| 31491 Textile bag and canvas mills | \$67.099 | 25\% | \$83.873 |
| 31499 Tire cord and tire fabric mills | \$22.863 | 25\% | \$28.578 |
| 31499 Other miscellaneous textile product mills | \$216.063 | 25\% | \$270.079 |
| 3. NAICS 315 Apparel | \$271.648 | -50\% | \$135.824 |
| Traditional Textiles and Apparel industries SUBTOTAL: | \$7,585.370 |  | \$9,444.366 |
| Key raw material suppliers and equipment: |  |  |  |
| 4. NAICS 111920 Cotton Farms | \$91.370 | 0\% | \$91.370 |
| 5. NAICS 115111 Cotton Gins | \$1.138 | 0\% | \$1.138 |
| 6. NAICS 325222 Noncellulosic Organic Fiber Manufacturing | \$3,300.080 | 25\% | \$4,125.100 |
| 7. NAICS 325221 Cellulosic Organic Fiber Manufacturing | \$251.322 | 25\% | \$314.152 |
| 8. NAICS 325131 Inorganic Dye and Pigment Manufacturing | \$754.083 | 25\% | \$942.604 |
| 9. NAICS 325132 Synthetic Organic Dye and Pigment Manufacturing | \$507.244 | 25\% | \$634.056 |
| 10. NAICS 333292 Textile Machinery | \$150.073 | -25\% | \$112.555 |
| Key raw material suppliers and equipment SUBTOTAL: | \$5,055.311 |  | \$6,220.975 |
| Wholesaling (margin activities only): |  |  |  |
| 11. NAICS 424310 Piece Goods, Notions, and Other Dry Goods Merchant Wholesalers |  | 25\% |  |
| 12. NAICS 423220 Home Furnishings Merchant Wholesalers |  | 25\% | \$0.000 |
| 13. NAICS 424320 Men's and Boys' Clothing and Furnishings Merchant Wholesalers |  | 25\% | \$0.000 |
| 14. NAICS 424330 Women's, Children's, and Infants' Clothing and Accessories |  | 25\% | \$0.000 |
| Merchant Wholesalers SUBTOTAL: | \$385.073 | 25\% | \$481.341 |
| Selected emerging producers of textile/fiber products |  |  |  |
| 15. NAICS 339113 Surgical Appliances and Supplies Manufacturing | \$208.496 | 50\% | \$312.744 |
| 16. NAICS 336360 Motor Vehicle Seating and Interior Manufacturing | \$81.177 | 50\% | \$121.765 |
| Selected emerging producers of textile/fiber products | \$289.673 |  | \$434.509 |

Source: Estimates by the authors using IMPLAN 2006
The growth targets by industry in TAC from Table 4 suggest an optimistic view of the TAC growth potential, given trends over the last ten years in the traditional sectors of this industry cluster. With this scenario, the total impacts of the TAC on the SC economy in 2016 are displayed in Table 5.


SOURCE: IHPLAN 2006 COHPUTATIONS BY THE AUTHORS
Final demand sales (primarily exports to other states and on international markets) rise from about $\$ 13.1$ billion in 2006 to $\$ 16.5$ billion in 2016. These final demand sales
result in 139,626 jobs, $\$ 9.7$ billion in value added and about $\$ 26.5$ billion in total sales in South Carolina. If the South Carolina economy grows at a real rate of 3\% per year, the TAC contributions to the overall economy under our optimistic scenario, while larger than in 2006 in absolute terms, fall from $4.9 \%$ of employment in 2006 to $4.5 \%$ of employment in 2016, about $8.4 \%$ of gross output in 2006 to $7.8 \%$ in 2016 and from $6.1 \%$ of valued added in 2006 to $5.7 \%$ in 2016.

## VI. Summary

An interindustry model of the South Carolina economy for 2006 (IMPLAN) is used to estimate the contributions of the textile and apparel industrial complex, or cluster TAC, to the state's economy. This model generates a view of the 2006 linkages between sectors of the state's economy and provides estimates of the value of shipments (sales) by each state industry to domestic and foreign markets. The virtue of this approach is that a complete accounting is made of all state economic activity and thus it is possible to isolate the contributions made by a set of industries like textiles and apparel to total state levels of economic activity.

The Textile and Apparel Cluster (TAC) is defined by a group of industries that include: the traditional textile and apparel sectors (NAICS, 313, 314 and 315), direct supporting supply chain industries that provide key raw material suppliers and equipment ( NAICS 111920 Cotton Farms, NAICS 115111 Cotton Gins, NAICS 325222 Noncellulosic Organic Fiber Manufacturing, NAICS 325221 Cellulosic Organic Fiber Manufacturing, NAICS 325131 Inorganic Dye and Pigment Manufacturing, NAICS 325132, Synthetic Organic Dye and Pigment Manufacturing, and NAICS 333292 Textile Machinery), related wholesaling margin activities ( NAICS 424310 Piece Goods, Notions, and Other Dry Goods Merchant Wholesalers, NAICS 423220 Home Furnishings Merchant Wholesalers, NAICS 424320 Men's and Boys' Clothing and Furnishings Merchant Wholesalers, and NAICS 424330 Women's, Children's, and Infants' Clothing and Accessories Merchant Wholesalers), and two emerging producers of textile/fiber products (NAICS 339113 Surgical Appliances and Supplies Manufacturing and NAICS 336360 Motor Vehicle Seating and Interior Manufacturing).

TAC impacts now and in the future. A snapshot of the TAC contributions to the SC economy in (2006) is provided in Table 6 along with impacts in 2016 using growth targets for each component of the TAC over the next decade. The growth targets allow $25 \%$ real growth over the decade in "Coping industries," $50 \%$ growth in "Flourishing" industries and no growth or $50 \%$ declines in "Potentially Vulnerable" industries (see Table 4 for target growth rates for each industry in the TAC). This target scenario suggests overall growth in the TAC from 2006 to 2016. Employment is projected to grow from 113, 258 TAC related jobs in 2006 to 139,626 in 2016. Still, this suggests a fall in the TAC employment share in all SC industries from $4.9 \%$ in 2006 to $4.5 \%$ in 2016.

While employment and earnings trends over the past 15 years in the TAC industries generally show decline, several sectors of the TAC have done well - especially in neighboring states. Over the past two decades, industry shipments in the "coping" and
"flourishing" sectors in South Carolina have not been able to offset the declines in "potentially vulnerable" sectors of the TAC in South Carolina so that overall TAC employment and earnings have declined since 1990. Accordingly, the scenario depicted in the growth targets for 2016 is in sharp contrast to most TAC industry trends since 1990.

To achieve the levels of economic activity in the 2016 targets will require a substantial effort by TAC industry leaders to exploit new and expanding markets for textile products and fibers in the supply chain for apparel production outside of South Carolina and the U.S. It may also require substantial growth in nonwovens and nontraditional textile products. Abernathy, et al (2005, p.1) contend that two major forces - lean retailing that provides incentives for close proximity to final customers, and trade and tariff policies that affect linkages between countries - can offset labor costs in establishing best locations for a variety of textile and apparel products. In their view, domestic firms that supply products where "responsiveness and flexibility" are important will continue to compete effectively with imports.

In this environment, some of the components of the South Carolina Textile and Apparel cluster are likely to maintain existing market shares and to find opportunities to grow in new product markets. As Eades, et al conclude, six state industries exhibited both a relative competitive advantage and good potential for future growth (positive trends in national Value Added, state employment, or national employment). These six sectors are: NAICS 31323, Nonwoven Fabric Mills, NAICS 32513 Synthetic Dye and Pigment Manufacturing, NAICS 336360 Motor Vehicle Seating and Interior Manufacturing, NAICS 339113 Surgical Appliances and Supplies Manufacturing, NAICS 423220 Home Furnishing Merchant Wholesalers and NAICS 424330 Women's, Children's, and Infants' Clothing and Accessories Merchant Wholesalers. These industries appear to have a good chance to become the leading sectors of the Textile and Apparel Cluster over the next decade in South Carolina.


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APPENDIX

## SC EMPLOYMENT ASSOCIATED WITH THE TEXTILE AND APPAREL INDUSTRY COMPLEX (TAC), 2006

## Number of jobs: FINAL SUPPLY CONSUMER DEMAND CHAIN INDUCED TOTAL

| IMPLAN SECTOR/NAICS |
| :---: |
| 1111 Crop Farming |
| 8 Cotton farming |
| 12112 Livestock |
| 14113 Forestry \& Logging |
| 16114 Fishing- Hunting \& Trapping |
| 18115 Ag \& Forestry Svcs |
| 19211 Oil \& gas extraction |
| 20212 Mining |
| 27213 Mining services |
| 30221 Utilities |
| 33230 Construction |
| 46311 Food products |
| 85312 Beverage \& Tobacco |
| 92313 Textile Mills |
| 95 Nonwoven fabric mills |
| 98 Fabric coating mills |
| 99314 Textile Products |
| 101 Textile bag and canvas mills |
| 102 Tire cord and tire fabric mills |
| 103 Other miscellaneous textile product m |
| 104315 Apparel Mfg |
| 109316 Leather \& Allied |
| 112321 Wood Products |
| 124322 Paper Manufacturing |
| 136323 Printing \& Related |
| 142324 Petroleum \& coal prod |
| 147325 Chemical Manufacturing |
| 149 Synthetic dye and pigment manufactu |
| 150 Other basic inorganic chemical manu |
| 154 Cellulosic organic fiber manufacturin |
| 155 Noncellulosic organic fiber manufact |
| 172326 Plastics \& rubber prod |
| 183327 Nonmetal mineral prod |
| 203331 Primary metal mfg |
| 224332 Fabricated metal prod |
| 257333 Machinery Mfg |
| 265 Textile machinery manufacturing |
| 302334 Computer \& oth electron |
| 325335 Electircal eqpt \& appliances |
| 344336 Transportation eqpmt |
| 350 Motor vehicle parts manufacturing |
| 362337 Furniture \& related prod |
| 374339 Miscellaneous mfg |
| 376 Surgical appliance and supplies manu |
| 39042 Wholesale Trade |
| 391481 Air transportation |
| 392482 Rail Transportation |
| 393483 Water transportation |
| 394484 Truck transportation |
| 395485 Transit \& ground passengers |
| 396486 Pipeline transportation |
| 397487 Sightseeing transportation |
| 398491 Postal service |
| 399492 Couriers \& messengers |
| 400493 Warehousing \& storage |
| 401441 Motor veh \& parts dealers |
| 402442 Furniture \& home furnishings |
| 403443 Electronics \& appliances stores |
| 404444 Bldg materials \& garden dealers |
| 405445 food \& beverage stores |
| 406446 Health \& personal care stores |


| 0.0 | 65.1 | 187.4 | 252.5 |
| :---: | :---: | :---: | :---: |
| 1,009.5 | 44.7 | 0.5 | 1,054.7 |
| 0.0 | 329.9 | 271.9 | 601.8 |
| 0.0 | 20.3 | 5.1 | 25.3 |
| 0.0 | 1.8 | 17.9 | 19.7 |
| 39.5 | 286.2 | 37.0 | 362.7 |
| 0.0 | 85.9 | 12.7 | 98.6 |
| 0.0 | 9.7 | 0.4 | 10.1 |
| 0.0 | 0.8 | 0.1 | 1.0 |
| 0.0 | 655.0 | 207.0 | 862.0 |
| 0.0 | 573.3 | 151.8 | 725.1 |
| 0.0 | 61.4 | 433.3 | 494.7 |
| 0.0 | 0.5 | 11.1 | 11.6 |
| 23,658.0 | 1,837.2 | 5.6 | 25,500.8 |
| 1,554.8 | 26.9 | 0.8 | 1,582.5 |
| 466.8 | 4.3 | 0.2 | 471.3 |
| 4,215.6 | 6.8 | 2.2 | 4,224.6 |
| 476.3 | 0.5 | 0.3 | 477.0 |
| 67.5 | 0.2 | 0.0 | 67.7 |
| 1,414.7 | 3.5 | 0.4 | 1,418.6 |
| 1,867.3 | 49.7 | 56.8 | 1,973.8 |
| 0.0 | 1.2 | 0.6 | 1.9 |
| 0.0 | 80.8 | 20.7 | 101.4 |
| 0.0 | 7.8 | 1.9 | 9.7 |
| 0.0 | 132.3 | 25.7 | 158.0 |
| 0.0 | 11.6 | 3.7 | 15.3 |
| 0.0 | 786.3 | 74.7 | 861.0 |
| 848.6 | 185.0 | 1.1 | 1,034.8 |
| 1,354.9 | 115.8 | 2.3 | 1,473.1 |
| 315.9 | 0.8 | 0.0 | 316.6 |
| 5,625.2 | 67.5 | 5.6 | 5,698.3 |
| 0.0 | 250.5 | 73.6 | 324.1 |
| 0.0 | 17.9 | 3.7 | 21.6 |
| 0.0 | 5.2 | 0.7 | 5.9 |
| 0.0 | 46.9 | 7.9 | 54.7 |
| 0.0 | 65.9 | 20.6 | 86.6 |
| 852.4 | 85.8 | 0.0 | 938.3 |
| 0.0 | 181.0 | 67.4 | 248.4 |
| 0.0 | 39.4 | 21.6 | 61.0 |
| 0.0 | 1.7 | 25.1 | 26.7 |
| 227.8 | 13.4 | 9.4 | 250.5 |
| 0.0 | 13.6 | 63.3 | 76.9 |
| 0.0 | 56.1 | 88.9 | 145.0 |
| 1,004.3 | 40.6 | 20.7 | 1,065.7 |
| 2,495.5 | 2,897.9 | 812.7 | 6,206.1 |
| 0.0 | 18.5 | 12.4 | 30.9 |
| 0.0 | 155.7 | 15.5 | 171.2 |
| 0.0 | 9.0 | 4.3 | 13.3 |
| 0.0 | 2,569.1 | 323.2 | 2,892.3 |
| 0.0 | 25.6 | 46.6 | 72.3 |
| 0.0 | 0.1 | 0.0 | 0.2 |
| 0.0 | 554.1 | 77.6 | 631.7 |
| 0.0 | 189.7 | 139.6 | 329.3 |
| 0.0 | 311.0 | 85.2 | 396.2 |
| 0.0 | 1,330.8 | 98.6 | 1,429.3 |
| 0.0 | 88.3 | 819.7 | 907.9 |
| 0.0 | 34.8 | 265.8 | 300.6 |
| 0.0 | 27.7 | 184.6 | 212.3 |
| 0.0 | 64.5 | 503.0 | 567.5 |
| 0.0 | 115.8 | 1,065.9 | 1,181.7 |
| 0.0 | 56.7 | 429.2 | 485.9 |

## SC EMPLOYMENT ASSOCIATED WITH THE TEXTILE AND APPAREL INDUSTRY COMPLEX (TAC), 2006 <br> Number of jobs: FINAL <br> DEMAND <br> SUPPLY CONSUMER CHAIN INDUCED TOTAL

## IMPLAN SECTOR/NAICS

```
407447 Gasoline stations
408448 Clothing & accessories stores
4 0 9 4 5 1 ~ S p o r t s - ~ h o b b y - ~ b o o k ~ \& ~ m u s i c ~ s t o ~
4 1 0 4 5 2 ~ G e n e r a l ~ m e r c h ~ s t o r e s
411453 Misc retailers
4 1 2 4 5 4 ~ N o n - s t o r e ~ r e t a i l e r s ~
4 1 3 5 1 1 ~ P u b l i s h i n g ~ i n d u s t r i e s ~
4 1 8 5 1 2 \text { Motion picture \& sound recordin}
420 515 Broadcasting
423518 Internet & data process svcs
425 522 Credit inmediation & related
4 2 6 5 2 3 \text { Securities \& other financial}
427 524 Insurance carriers & related
429525 Funds- trusts & other finan
430521 Monetary authorities
4 3 1 5 3 1 ~ R e a l ~ e s t a t e
432532 Rental & leasing svcs
4 3 6 5 3 3 \text { Lessor of nonfinance intang asset}
4 3 7 5 4 1 ~ P r o f e s s i o n a l - ~ s c i e n t i f i c ~ \& ~ t e c h ~ s v ~
451 551 Management of companies
452 561 Admin support svcs
460 562 Waste mgmt & remediation svcs
4 6 1 6 1 1 \text { Educational svcs}
464 621 Ambulatory health care
4 6 7 6 2 2 \text { Hospitals}
4 6 8 6 2 3 \text { Nursing \& residential care}
4 6 9 6 2 4 \text { Social assistance}
471711 Performing arts & spectator sport
475 712 Museums & similar
476 713 Amusement- gambling & recreat
479721 Accomodations
481722 Food svcs & drinking places
4 8 2 8 1 1 ~ R e p a i r ~ \& ~ m a i n t e n a n c e ~
4 8 7 8 1 2 \text { Personal \& laundry svcs}
4 9 1 8 1 3 ~ R e l i g i o u s - ~ g r a n t m a k i n g - ~ \& ~ s i m i l a ~
4 9 3 \text { Civic- social- professional and simila}
4 9 4 8 1 4 ~ P r i v a t e ~ h o u s e h o l d s
49592 Government & non NAICs
```


## SC GROSS OUTPUT (SALES) BY THE TEXTILE AND APPAREL INUSTRY COMPLEX (TAC), 2006

| IMPLAN SECTOR/NAICS |  |
| :---: | :---: |
| 1111 Crop Farming | 0 |
| 8 Cotton farming | 91,370,000 |
| 12112 Livestock | 0 |
| 14113 Forestry \& Logging | 0 |
| 16114 Fishing- Hunting \& Trapping | 0 |
| 18115 Ag \& Forestry Svcs | 1,138,000 |
| 19211 Oil \& gas extraction | 0 |
| 20212 Mining | 0 |
| 27213 Mining services | 0 |
| 30221 Utilities | 0 |
| 33230 Construction | 0 |
| 46311 Food products | 0 |
| 85312 Beverage \& Tobacco | 0 |
| 92313 Textile Mills | 4,996,371,968 |
| 95 Nonwoven fabric mills | 520,823,968 |
| 98 Fabric coating mills | 144,732,000 |
| 99314 Textile Products | 1,345,769,984 |
| 101 Textile bag and canvas mills | 67,099,000 |
| 102 Tire cord and tire fabric mills | 22,863,000 |
| 103 Other miscellaneous textile product m | 216,063,008 |
| 104315 Apparel Mfg | 271,648,000 |
| 109316 Leather \& Allied | 0 |
| 112321 Wood Products | 0 |
| 124322 Paper Manufacturing | 0 |
| 136323 Printing \& Related | 0 |
| 142324 Petroleum \& coal prod | 0 |
| 147325 Chemical Manufacturing | 0 |
| 149 Synthetic dye and pigment manufactu | 507,244,000 |
| 150 Other basic inorganic chemical manu | 754,083,008 |
| 154 Cellulosic organic fiber manufacturin | 251,322,000 |
| 155 Noncellulosic organic fiber manufact | 3,300,080,128 |
| 172326 Plastics \& rubber prod | 0 |
| 183327 Nonmetal mineral prod | 0 |
| 203331 Primary metal mfg | 0 |
| 224332 Fabricated metal prod | 0 |
| 257333 Machinery Mfg | 0 |
| 265 Textile machinery manufacturing | 150,072,992 |
| 302334 Computer \& oth electron | 0 |
| 325335 Electircal eqpt \& appliances | 0 |
| 344336 Transportation eqpmt | 0 |
| 350 Motor vehicle parts manufacturing | 81,177,000 |
| 362337 Furniture \& related prod | 0 |
| 374339 Miscellaneous mfg | 0 |
| 376 Surgical appliance and supplies manu | 208,496,000 |
| 39042 Wholesale Trade | 385,072,992 |
| 391481 Air transportation | 0 |
| 392482 Rail Transportation | 0 |
| 393483 Water transportation | 0 |
| 394484 Truck transportation | 0 |
| 395485 Transit \& ground passengers | 0 |
| 396486 Pipeline transportation | 0 |
| 397487 Sightseeing transportation | 0 |
| 398491 Postal service | 0 |
| 399492 Couriers \& messengers | 0 |
| 400493 Warehousing \& storage | 0 |
| 401441 Motor veh \& parts dealers | 0 |
| 402442 Furniture \& home furnishings | 0 |
| 403443 Electronics \& appliances stores | 0 |
| 404444 Bldg materials \& garden dealers | 0 |

## SC GROSS OUTPUT (SALES) BY THE TEXTILE AND APPAREL INUSTRY COMPLEX (TAC), 2006



Source: IMPLAN 2006 computations by the authors

## SC VALUE ADDED BY THE TEXTILE AND APPAREL INUSTRY COMPLEX (TAC), 2006 <br> SUPPLY CONSUMER CHAIN INDUCED TOTAL



| $\begin{array}{r} 0 \\ 35,140,888 \end{array}$ |
| :---: |
|  |  |
|  |
| 0 |
| 0 |
| $802,335$ |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 1,226,387,328 |
| 141,146,208 |
| 45,412,472 |
| 399,769,920 |
| 22,393,214 |
| 7,462,781 |
| 69,380,760 |
| 92,587,808 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 122,264,272 |
| 247,253,312 |
| 77,763,176 |
| 805,655,424 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 56,653,052 |
| 0 |
| 0 |
| 18,064,378 |
|  |  |
|  |
| 0 |
| 85,636,384 |
| 259,490,256 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |

0

2,195,74
1,556,922
8,497,877
1,278,249
37,823
5,811,879
6,033,929
965,595
42,586
226,675,824
26,735,468
3,269,889
51,115
95,239,208
2,441,696
421,274
644,076
21,623
21,206
171,017
2,465,253
35,840
6,352,565
1,165,683
8,189,425
1,238,233
150,904,448
26,658,558
187,764
9,665,411
24,464,216
2,181,400
679,937
3,854,637
6,129,604
5,704,238
11,547,775
4,661,027


1,060,003


3,974,908
3,465,563
301,327,296
792,817
23,891,016
711,067
142,309,520


64,690
32,411,264
9,976,620
13,304,474
56,680,580
5,649,228
1,785,880
1,356,720
3,457,810
4,133,900
$2,323,031$
$2,268,528$

## SC VALUE ADDED BY THE TEXTILE AND APPAREL INUSTRY COMPLEX (TAC), 2006



## Source: IMPLAN 2006 computations by the authors

## Definitions for Table 1. The Meaning of the Measures

| Measure | Information |
| :---: | :---: |
| Total Employment | Total number of workers who were employed by the same employer in both the current and previous quarter <br> Answers the questions: <br> - Who is filling what jobs? <br> - What industries are biggest employers? <br> - What industries employ the largest numbers of particular types of worker? |
| Job Change | Net Employment Change: The difference between current and previous employment at each business. <br> Answers the questions: <br> - Which industries are expanding employment? <br> - Which industries are contracting employment? |
| Job Creation | The number of new jobs that are created by either new area businesses or the expansion of employment by existing firms. Answers the question: <br> - What industries are creating the most jobs? |
| Average Monthly Earnings | Total quarterly earnings of all full-quarter employees divided by the number of full-quarter employees, divided by 3 . Answers the question: <br> - What are the average earnings of core employees? |

(Check http://lehd.dsd.census.gov/led/datatools/qwi-online.html for more information). Accessed 11/13/07

## DEFINITIONS

"The Quarterly Workforce Indicators (QWI) are derived from state administrative records and basic demographic information from the Census Bureau. Employment totals from the QWI are not exactly comparable with those from other sources. Generally, coverage and definitions differ between the QWI and data about establishments from administrative records (e.g., the Quarterly Census of Employment and Wages or QCEW), and about workers from surveys (e.g., the decennial census, the American Community Survey, and the Current Population Survey or CPS.) Detailed information is available in a paper by David Stevens "Employment that is not covered by state unemployment insurance laws", LEHD technical paper TP-2002-16

Jobs. Just like the QCEW, the QWI count jobs, rather than employed workers (like the CPS). And, like the QCEW, the QWI do not include self employed workers and independent contractor employment - unlike the CPS. For a full description, see http://www.bls.gov/cew/cewover.htm. But unlike the QCEW, the QWI count all jobs within a quarter (rather than just the $12^{\text {th }}$ of the month), and so the job counts from the QCEW and the QWI will differ.

More specifically, the QWI capture the complexity of workforce dynamics. Because the LED data from which the QWI are derived include all the jobs a worker holds in each quarter, multiple definitions of "employment" are possible (just as there are multiple definitions of "unemployment"). The definitions include:

1) 2) All jobs held in a quarter, regardless of length of time the job is held;
1) 2) Jobs held at the beginning of a quarter -- the measure that is closest to that is the Quarterly Census of Employment and Wages. This measure also shows trends similar to those in surveys based on workers (such as the CPS) although the levels differ;
1) 3) Jobs held at the end of a quarter; and
1) 4) Jobs held for a full quarter (the most "stable" measure of employment).

Earnings. The measurement of earnings differs among datasets. The earnings measures described here:

-     - Include gross wages and salaries, bonuses, stock options, tips, and other gratuities, and the value of meals and lodging, where supplied.
- Do not include Old Age Survivor and Disability Insurance, health insurance, workers' compensation, unemployment insurance, private pensions, and welfare funds.
Because the QWI measures do not include the number of hours or weeks an employee worked, what appears as low average earnings for a time period and for an industry such as retail trade where much of the work is part time, may be the result of relatively low hourly wages, not working many hours in the time period, or both. This affects the interpretation of the measure of average earnings. Similarly, high fourth quarter monthly earnings in some industries may reflect end-of-year bonuses and apparently high earnings for older workers may reflect one-time disbursements as they retire."
Accessed 11/13/07 from http://lehd.dsd.census.gov/led/datatools/qwi-online.html


[^0]:    ${ }^{1}$ Consumption spending by households on textiles and apparel produced in South Carolina represents a small share of total final demand for TAC goods and services. Moreover, since the closed IO model is used to capture SC household spending on all goods and services "induced" by the other final demand sales (investment + government + exports), we exclude SC consumer purchases for TAC goods and services as a component on final demand in the impact analysis. By using final demand sales as the "driver" for the total contribution estimates, we avoid double counting. For example, the value of the cotton fabric embedded in cotton shirt export sales is counted only once - in the export final demand sale, not in the sale from cotton textile mills to an apparel manufacturer.

[^1]:    ${ }^{2}$ The only exception is that Georgia's exports of Apparel (NAICS 315) lagged SC exports in 2006.

[^2]:    3 "Preliminary results using the Global Textile Competitiveness Framework have indicated that the three segmentation groups ("Flourishing," "Coping," "Potentially Vulnerable") have strategic positioning in the global textile complex. While further analyses are needed, it appears that: 1. "Flourishing" companies are implementing three (3) or more of the segmentation criteria (Table 25). These companies have a physical presence in a South Carolina cluster, and are "linked" with other organizations via business relationships, web presence, association membership, and/or company organization (headquarters in South Carolina). Flourishing companies are more likely to be involved in advanced activities, including innovations in technology, products, markets, and are marketing diverse products. 2. "Coping" companies have implemented two (2) of the segmentation criteria (Table 25) and are searching for opportunities and pursuing "linked connections" in the State --- both with customers and suppliers as well as with clusters. These companies, historically rooted in traditional textile and apparel manufacturing, have limited global "knowledge" but may be interested in pursuing a global presence. 3. "Potentially Vulnerable" companies have implemented only one (1) or no segmentation criteria as part of their business model. In general these

