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THE TRIAD BIOSCIENCE INDEX

is

A PROJECT OF THE *ASSESSMENT/INVENTORY PROJECT TEAM*

**Under direction of the
ADVISORY COMMITTEE FOR BIOTECHNOLOGY IN THE
PIEDMONT TRIAD**

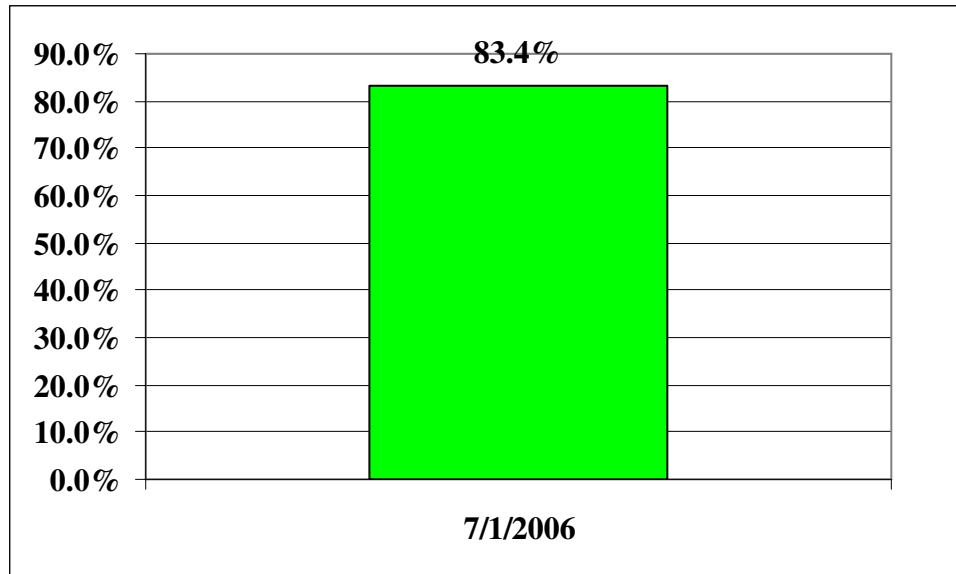
**PIEDMONT TRIAD OFFICE
NORTH CAROLINA BIOTECHNOLOGY CENTER**

**FUNDED BY
CHAMBER³ (WINSTON SALEM, HIGH POINT, GREENSBORO)**

1. Business Conditions

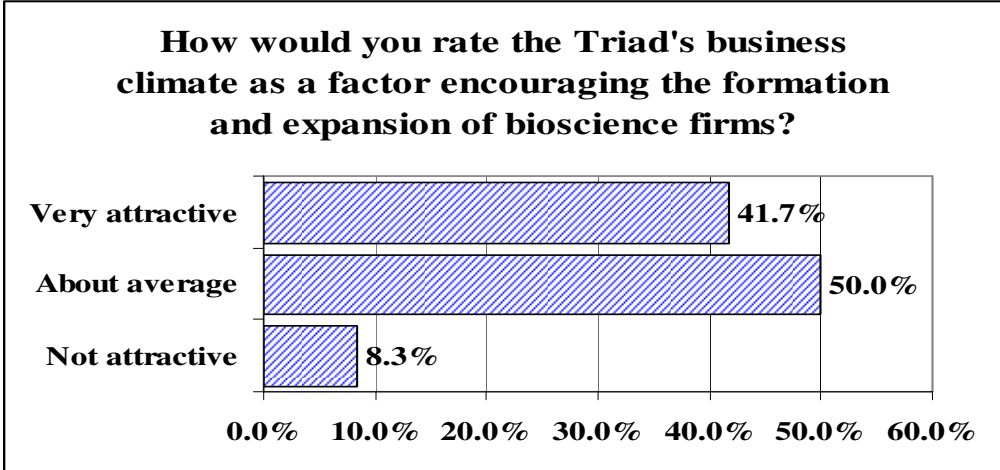
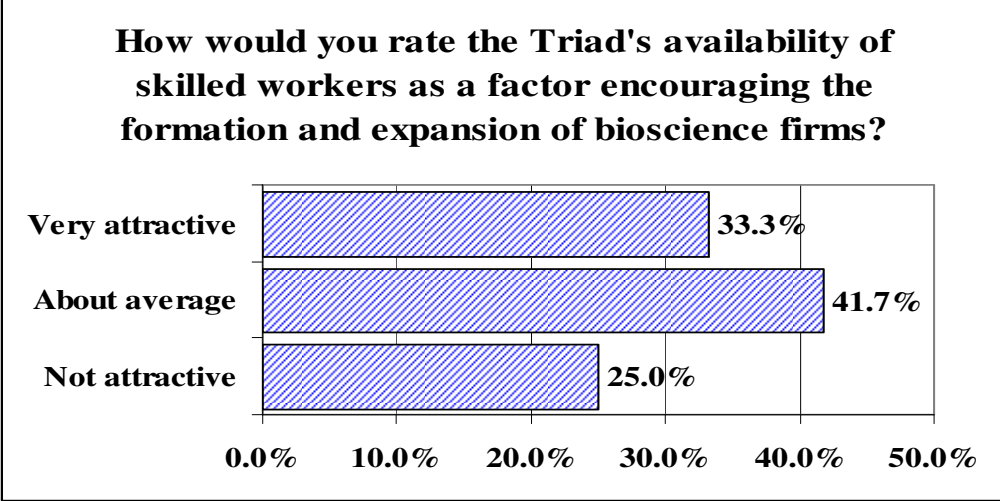
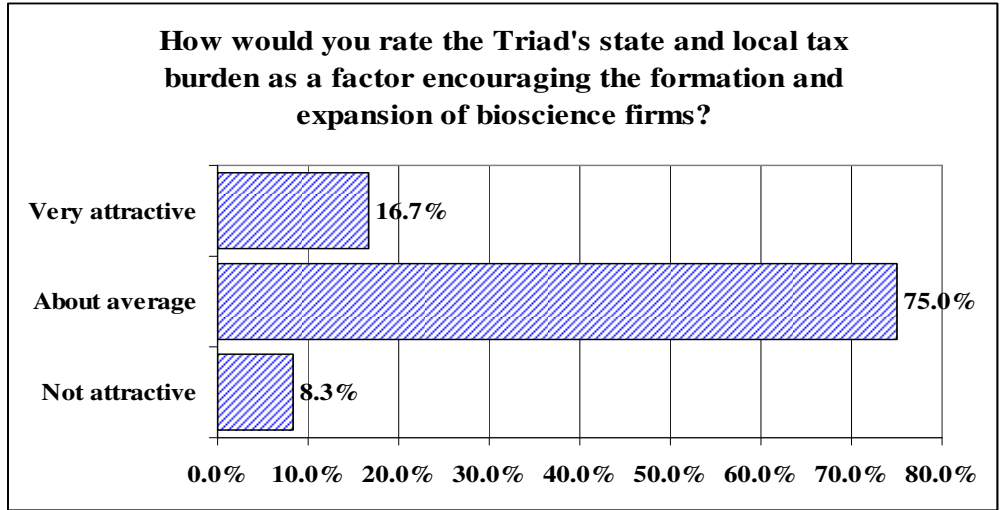
The Triad Bioscience Index registered 83.4 in the 2nd quarter of 2006, indicating that bioscience business activity in the Triad is expanding rapidly. A reading above 50 means bioscience business activity is expanding.

Figure 1: The Triad Bioscience Index



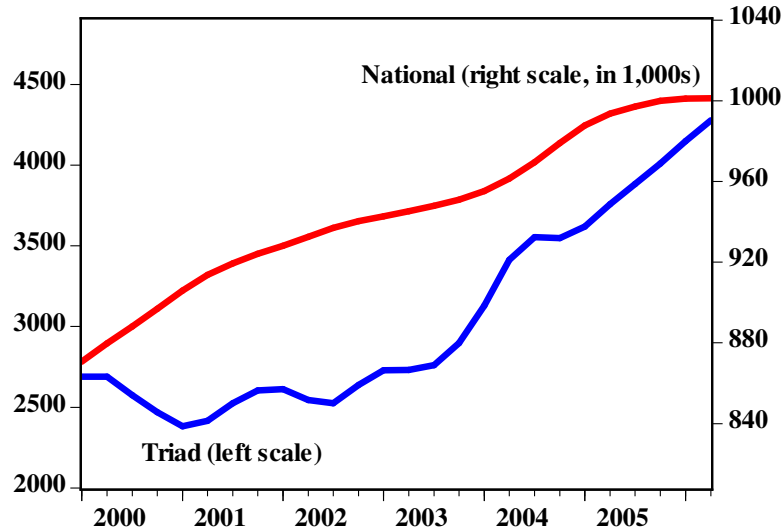
The index was generated by the assessments of the Triad Bioscience Forum, an expert panel of bioscience executives in the Triad. The Forum was also queried about factors supporting the formation and expansion of bioscience firms in the Triad. The results are shown in Figure 2. The Panel ranked the Triad “above average” on each of the three factors examined: taxes, labor supply, and general business climate.

**Figure 2: Factors Supporting the Formation and Expansion of
Bioscience Firms in the Triad**



Labor market conditions reflect the demand and supply for bioscience workers. Table 1 shows bioscience employment in the Triad through the second quarter of 2006.¹ Employment in the bioscience sector totaled 4,278 in the second quarter, up 13.9 percent from the same period one year ago. Employment grew 3.1 percent in the second quarter of this year. Goods-producing employment totaled 714, down 13.7 percent from the same period one year ago, and off 3.6 percent from the first quarter. Over the past year, the growth of bioscience employment in the Triad out-paced the growth of bioscience employment nationally. National bioscience employment has risen just 0.7 percent since the second quarter of 2005 (Figure 4).

Figure 4: Bioscience Employment



Total wages paid in the second quarter in the Triad’s bioscience sector totaled \$276.8 million, up 6.1 percent from the second quarter one year ago and 1.9 percent above the first quarter. The average annual wage in the second quarter was \$64,696 which was down 6.8 percent from the average in the second quarter of 2005. Nevertheless, average wages in the bioscience sector are substantially above the average for all Triad workers.²

3. Stock Market Trends

Economists have long recognized that stock prices provide a valuable indicator of future economic conditions, and any change in expected profits is quickly reflected the stock prices of existing firms

The *Triad Bioscience Stock Index* (see Figure 5) has risen 8.9 percent over the past 12 months, but is off 0.4 percent since the first of the year.³ In comparison, the *Merrill Lynch Biotech Holders Exchange Traded Fund* (BBH) which invests in a portfolio of biotechnology companies

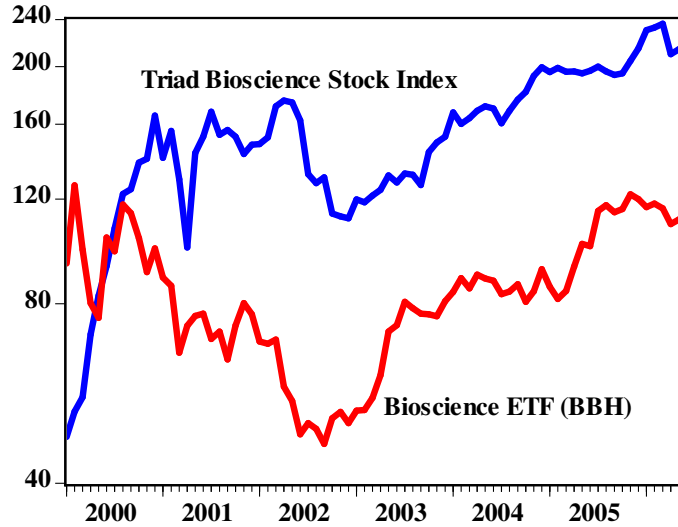
¹ The Triad is defined to include 1) the Burlington, MSA, 2) the Greensboro/High Point MSA, and 3) the Winston-Salem MSA.

² Wages for all workers in 2005 averaged \$34,892 in the Greensboro/High Point MSA, \$36,660 in the Winston-Salem MSA, and \$31,044 in the Burlington MSA. See: <http://eslmi23.esc.state.nc.us/ew/EWGeoArea.asp?Report=1&Year=2005&Period=00>

³ There are eleven companies in the *Triad Bioscience Stock Index*: Arrow International (ARRO), Cardinal Health (CAH), Ciba Specialty Chemicals Corp (CSB), Corn Products International (CPO), Idexx Pharmaceuticals (IDXX), LabCorp (LH), MWG Biotech Inc. (NWU.BE), Mylan Laboratories, Inc. (MYL), Novartis Animal Health US Inc. (NVS), Syngenta (SYT), and Targacept (TRGT).

traded on U.S. markets nationally is down 8.0 percent over the past 12 months and 10.2 percent since the first of the year.⁴

**Figure 5: Bioscience Stock Price Indexes
(Monthly prices, log scale)**



These recent stock market trends suggest that market participants have relatively stable profit expectations for Triad bioscience companies. Market participants are more optimistic on Triad bioscience companies than on the bioscience sector nationwide.

⁴ The *Merrill Lynch Biotech Holders Fund* (BBH) seeks to invest in the biotechnology industry through a single, exchange-listed fund. The trust holds securities traded on U.S. stock markets that, when initially selected, were issued by companies involved in the biotechnology industry. There are currently 18 companies included in the Biotech HOLDERS. See: <http://finance.yahoo.com/q/pr?s=BBH>

4. Annual Indicators of Bioscience Activity

In addition to the quarterly indicators of bioscience activity, other annual indicators can provide further measures of bioscience activity in the Triad relative to centers of bioscience activity elsewhere in the nation. Three important indicators are 1) employment, 2) patents, and 3) National Institute of Health (NIH) grants.

Table 2: Bioscience Employment, 2004
(Major East Coast Market Cities, NAICS 3254, 54171, and 6215)

Area	Employment	Employment Per 1,000,000 Population
New York-Northern NJ-Long Island, NY-NJ-PA	107,180	5,729
Chicago-Naperville-Joliet, IL-IN-WI	45,906	4,888
Washington-Arlington-Alexandria, DC-VA-MD	37,901	7,374
Raleigh/Durham/Chapel Hill, NC	20,004	14,645
Baltimore-Towson, MD	16,756	6,349
Pittsburgh, PA	7,376	3,071
Atlanta-Sandy Springs-Marietta, GA	6,650	1,412
Greensboro/Winston-Salem/High Point, NC	3,391	2,718
Richmond, VA	3,256	2,821
Charlotte-Gastonia-Concord, NC-SC	1,284	871
Boston-Cambridge-Quincy, MA-NH	n.a.	n.a.
Philadelphia-Camden-Wilmington, PA-NJ-DE	n.a.	n.a.

Source: U.S. Bureau of Labor Statistics, <http://data.bls.gov/cgi-bin/srgate> and NC Employment Security Commission.

Table 2 shows bioscience employment in major east coast cities in 2004. The bioscience sector is defined as NAICS 3254, 54171, and 6215. Table 2 shows that the bioscience sector in the Triad is relatively small compared to other centers of bioscience employment on the east coast, but larger than Richmond or Charlotte.

The number of patents granted to an industry provides a measure of industrial creativity and technological effort. A patent is a grant that protects the property rights of the inventor. It is granted by the U.S. Patent and Trademark Office (PTO), a division of the U.S. Department of Commerce. A patent allows the inventor to exclude others from making, using, selling, or importing the new invention for 20 years from the date of the application. Table 3 (on the next page) shows the number of bioscience patents granted in the Triad and other major east coast centers in 2005.

**Table 3: Bioscience Patents, 2005
(Major East Coast Market Cities)**

Area	Number	Per 1,000 Population
New York-Northern NJ-Long Island, NY-NJ-PA	122	7
Boston-Cambridge-Quincy, MA-NH	108	24
Raleigh/Durham/Chapel Hill, NC	108	79
Washington-Arlington-Alexandria, DC-VA-MD	69	13
Philadelphia-Camden-Wilmington, PA-NJ-DE	67	12
Chicago-Naperville-Joliet, IL-IN-WI	36	4
Greensboro/Winston-Salem/High Point, NC	36	29
Richmond, VA	31	27
Atlanta-Sandy Springs-Marietta, GA	26	6
Pittsburgh, PA	25	10
Baltimore-Towson, MD	22	8
Charlotte-Gastonia-Concord, NC-SC	18	12

Source: US Patent Office. See: <http://www.uspto.gov/> Bioscience patents include patent class codes: 128, 514, 604, and D24.

Table 3 again shows that bioscience in the Triad is relatively small; however, in 2005, the number of patents granted was larger than in some more well-known bioscience centers such as, Atlanta, Pittsburgh, and Baltimore. On a per capita basis, the number of patents developed in the Triad was larger than in New York, Boston, and Philadelphia, attesting to the intensity of bioscience activity in the Triad.

Research and development is very important to the growth of bioscience because bioscience products and applications are derived from basic biological research. This kind of research is undertaken primarily at academic research institutions and medical research facilities by biological scientists with the substantial public funding. The National Institute of Health (NIH) is the primary public institution funding bioscience research. Table 4 shows the level of NIH funding to institutions in the Triad and elsewhere on the east coast.

Table 4: National Institute of Health Awards, 2005

Area	Awards	Per 1,000 Population
Boston-Cambridge-Quincy, MA-NH	\$1,857,325,429	\$419,768
New York-North NJ-Long Isle, NY-NJ-	\$1,291,584,275	\$69,032
Philadelphia-Camden-Wilmington, PA-NJ-DE	\$820,470,704	\$141,445
Baltimore-Towson, MD	\$807,193,743	\$305,846
Raleigh/Durham/Chapel Hill, NC	\$777,127,490	\$568,952
Chicago-Naperville-Joliet, IL-IN-WI	\$582,113,887	\$61,983
Pittsburgh, PA	\$470,556,292	\$195,937
Atlanta-Sandy Springs-Marietta, GA	\$285,743,242	\$60,689
Washington-Arlington-Alexandria, DC-VA-MD	\$211,412,791	\$41,135
Greensboro/Winston-Salem/High Point, NC	\$118,035,532	\$94,609
Richmond, VA	\$68,617,011	\$59,444
Charlotte-Gastonia-Concord, NC-SC	\$5,301,552	\$3,595

Source: National Institute of Health. See: <http://grants1.nih.gov/grants/award/state/state.htm>

The level of NIH funding in the Triad is relatively small, but again on a per capita basis, bioscience research is more intense in the Triad than in other, more well-known east coast centers such as New York, Chicago, Washington, and Atlanta.