DISTRICT DIGEST

Long–Term Industry and Occupation Outlook in the Fifth District

BY ANN MACHERAS

The Bureau of Labor Statistics (BLS) publishes projections biennially for the various occupations that produce all of the goods and services in our economy — from the bricklayer to the computer programmer. The occupational employment projections offer a view into expected changes in the number of people employed in each profession over a 10-year time horizon. (There are approximately 750 occupations in the classification system used by BLS and other federal agencies, known as the Standard Occupational Classification system, or SOC.) The current projection period covers 2008 to 2018. In contrast to forecasts of near-term economic activity, the long-term projections for growth in occupations convey valuable insight on growth or decline in occupations over a period of time that is sufficient to allow for planning and strategic decisionmaking.

The development of long-term employment projections dates back nearly 60 years, to shortly after the end of World War II, and their original purpose was to provide career information for veterans returning to civilian life. Today, occupational employment projections provide valuable information that serves an even broader set of customers in three important areas: career advice and planning, curriculum planning for education and training institutions, and alignment of economic development planning with the workforce. Employment changes across occupations matter a great deal to guidance counselors in middle schools and high schools as they offer career advice to help students match their interests to potential opportunities, while also considering the availability of future job openings. Likewise, postsecondary institutions, whether four-year colleges and universities, community colleges, or technical institutes, use the projections as a valuable component to plan for the appropriate courses and majors or technical training that will serve the needs of their students over time. Finally, economic development agencies use the projections to set realistic targets for the types of industries they want to attract and promote in their region, so that the workforce needed by companies will match the availability of specific occupations.

How the Projections Are Derived

The methodology and the timing of the projections have evolved over the years to the current two-year cycle. Development of the national projections involves several related steps, starting with estimates of the total labor force for the projection year. Census estimates of the size and demographic composition of the population are combined with projected labor force participation rates to obtain an estimate of the labor force in 2018.

In turn, the labor force projections feed a model of the U.S. economy to derive estimates of growth in the aggregate economy. Growth in the economy stems from demand for goods and services on the part of households, businesses, the government, and other countries. Together, these sources of demand, referred to as "final demand," generate growth across many industry sectors within the economy. While some industry sectors expand output in direct response to final demand, others grow because they supply inputs to expanding industries. The resulting projections of industry output imply a level of industry employment, taking into account other factors, such as expectations of productivity growth.

Finally, detailed occupational employment for each industry is estimated by applying an industry-occupation matrix, often called a staffing matrix, to the projected industry employment. The staffing matrix assigns industry employment to all of the occupations that are used in a particular industry; it is based on the BLS' Occupation Employment Statistics (OES) survey, which collects data from employers on a triennial cycle. Throughout the entire estimation process, a number of assumptions are made regarding the path of the economy over the 10-year horizon, the effect of demographic changes on the rate of labor force participation, and technological advances in production.

To be sure, output by industry can move at a different pace and even in the opposite direction from employment by industry, reflecting the type of technological progress that allows for more output to be produced with fewer workers. This is an important distinction because growth, as measured by greater output, may not create additional job opportunities in every case. For this reason, careful estimates of future industrial production and employment, based on appropriate assumptions regarding technological developments and expected productivity growth, form the foundation for accurate projections of employment by occupation.

The information gained from the occupational employment projections differs in a meaningful way from the projections by industry. While industry-level projections tell us what firms will produce, the occupation-level projections tell us how labor will be combined to do the work. In addition, the occupational projections summarize the net employment change for a particular occupation across various industries. For example, we know the demand for computer systems analysts will grow, but the projections also tell us that the management, scientific, and technical

consulting services industry will increase the number of analysts they employ, while wired telecommunications carriers will reduce their use of computer systems analysts by 2018. This type of information allows a job seeker to tailor his job search to a particular industry where chances of success are higher.

State workforce agencies and labor market information departments use the national projections from the BLS to prepare their own state and local area industry and occupational employment projections. Clearly, the more geographically focused projections provide great value to the customers of the information — students of all ages, guidance and career counselors, postsecondary education institutions, and economic developers — who are all involved in planning at a more local level. To the extent that the industry mix of the state or region differs from the industry composition of the nation, the occupational employment projections will reveal different trends in demand for occupations at the local level. So, what do the industry and occupational employment projections reveal for the states in the Fifth District?

Industry-Level Employment Projections

Most of the states in the Fifth District publish their long-term projections for employment by industry at the same time that they publish the occupational employment projections. For the top 10 fastest-growing industries in Maryland, West Virginia, Virginia, and South Carolina, some common trends emerged. Health care and social assistance industries are expected to show the fastest rates of job growth from 2008-2018 for the Fifth District states and for the nation. These industries include ambulatory health care services, hospitals, nursing and residential care facilities, and social assistance. (Industry-level projections for 2008-2018 were not available from North Carolina and the District of Columbia at press time.)

Virginia projected the fastest job growth in ambulatory

Projected Occupational Employment Composition in 2018 — Fifth District States

Major Occupation Groups	MD	VA	NC	SC	State Total	U.S.
Transportation and material moving	5.1	5.4	6.7	6.3	5.9	6.1
Production	3.1	4.4	7.3	8.8	5.8	5.9
Installation, maintenance, and repair	3.7	4.0	3.9	4.6	4.0	3.8
Construction and extraction	6.0	5.7	5.4	5.1	5.6	5.3
Farming, fishing, and forestry	0.2	0.8	0.4	0.9	0.5	0.6
Office and administrative support	14.9	14.3	14.4	14.8	14.5	15.6
Sales and related	10.1	10.4	10.7	10.9	10.5	10.2
Service	20.1	19.4	20.7	21.2	20.3	20.2
Professional and related	24.4	23.9	20.1	18.8	22.0	21.8
Management, business, and financial	12.3	11.7	10.3	8.5	10.9	10.5

NOTE: State total does not include all Fifth District jurisdictions. At press time, the District of Columbia has not yet published 2008-2018 statistics and West Virginia did not publish group level data.
SOURCES: Bureau of Labor Statistics, Individual State Labor Market Information Offices

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health care services, nursing and residential care facilities, and social assistance, while South Carolina registered the fastest growth expected for hospitals. In addition to their high percentage growth rates, many of the health care-related industries will also provide the largest gain in the absolute number of jobs over the 10-year period. Other high-growth industries common to these four states include data centers and informational technology, as well as professional, scientific, and technical services. In contrast to the other states, West Virginia's projected fastest-growing industry over this period is the construction of buildings.
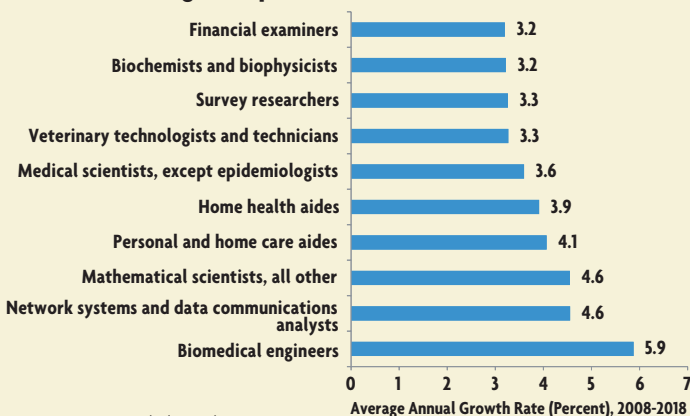
Overall employment is expected to grow in the Fifth District states for which we have data, but only Virginia's is expected to grow at an average annual rate that exceeds the national growth rate of 1 percent.

Projections for Occupational Employment

The long-term industry employment projections are interesting in themselves, but also are critical as input to the projections of occupational employment. Shifts in the industrial structure of the economy translate into changes in demand for many occupations and, over time, even the emergence of new occupations. The occupational employment projections reveal how people are employed in the base year and how the composition of employment will change over the 10-year horizon.
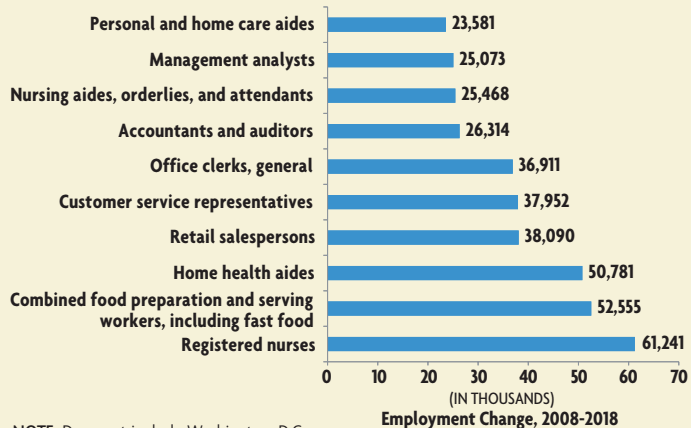
For the nation as a whole, professional and service occupations already accounted for 40 percent of occupational employment in 2008 (the base year). By 2018, the share of these broad occupation groups is expected to increase to 43 percent. On the other hand, sales and office and administrative support occupations, which together accounted for more than 26 percent of employment in 2008, will likely make up a smaller share of employment in 2018, due to the application of technology that reduces the number of sales personnel and office clerks required to support a business. Likewise, the share of production workers is expected to decline, from 6.7 percent in 2008 to 5.9 percent in 2018, as manufacturing continues to implement technology that changes the quantity and the mix of workers.

Fastest-Growing Occupations — Fifth District States

Occupation	Average Annual Growth Rate (Percent), 2008-2018
Financial examiners	3.2
Biochemists and biophysicists	3.2
Survey researchers	3.3
Veterinary technologists and technicians	3.3
Medical scientists, except epidemiologists	3.6
Home health aides	3.9
Personal and home care aides	4.1
Mathematical scientists, all other	4.6
Network systems and data communications analysts	4.6
Biomedical engineers	5.9

NOTE: Does not include Washington, D.C.
SOURCES: Bureau of Labor Statistics, Individual State Labor Market Information Offices

Occupations with Largest Gain — Fifth District States

Occupation	Employment Change, 2008-2018 (in thousands)
Personal and home care aides	23,581
Management analysts	25,073
Nursing aides, orderlies, and attendants	25,468
Accountants and auditors	26,314
Office clerks, general	36,911
Customer service representatives	37,952
Retail salespersons	38,090
Home health aides	50,781
Combined food preparation and serving workers, including fast food	52,555
Registered nurses	61,241

NOTE: Does not include Washington, D.C.
SOURCES: Bureau of Labor Statistics, Individual State Labor Market Information Offices

Across the Fifth District, there is some variation in the projected composition of employment by occupation in 2018. Maryland and Virginia's employment in professional and related occupations will exceed the national average, with shares of 24.4 percent and 23.9 percent, respectively, versus 21.8 percent for the nation. South Carolina expects a higher share of production workers relative to the other Fifth District states and the nation, but it will also have a higher share of service and sales related occupations as well (see table on page 41).

Changing demand for occupations is best explored by a closer look at some of the 750 occupations for which long-term projections are available. It is helpful to consider the rate of change in employment by occupation, as well as the change in the number of jobs by occupation. The fastest-growing occupations do not necessarily create the greatest number of jobs, although their growth is important in terms of the needs of particular industries and the educational programs that generate the pipeline of future workers. Also, some of the fastest-growing occupations are also the most highly compensated. In contrast, some of the greatest job gains will be created in occupations with a modest growth rate (due to the high number of workers in those occupations), such as cashiers and food preparation, which will grow fairly steadily to match population growth, or registered nurses, whose numbers will grow to serve the rising share of older age groups within the population.

Within the Fifth District, biomedical engineers was the fastest-growing occupation, ranking first for every state, with an average annual growth of 5.9 percent expected between 2008 and 2018 in the District, compared to growth of 5.6 percent nationally. (See chart on page 41.) Together, Virginia, Maryland, and North Carolina account for 95 percent of the demand for biomedical engineers in the Fifth District in 2018, although every District state registers a growth rate of at least 5 percent. Moreover, the median salary for biomedical engineers in the United States was $77,400 in 2008, making this a highly compensated occupation. Advances in technology and innovations in medicine will drive the high growth for biomedical engineers over the coming decade.

Other occupations with high rates of expected growth in the Fifth District include network systems and data communications analysts, mathematical scientists, personal home care aides, and home health aides, rounding out the top five growth occupations. The fastest-growing occupations derive directly from the fast-growing industries projected for the Fifth District, where health care, data processing, and professional and technical services topped the list.

By comparison, the largest absolute gain in employment by occupation is in registered nurses, an occupation that is projected to grow by 61,241 in the Fifth District, far outnumbering other occupations in terms of total jobs created. (See adjacent chart.) Although employment of registered nurses is expected to grow in *percentage* terms at only a moderate rate of 2.2 percent, the growth in the number of registered nurses implies a greater need for education and training programs in Fifth District community colleges and four-year colleges and universities. Registered nurses also earn relatively high salaries, with the national median of $62,450 in 2008. Clearly, for individuals with an interest in nursing, the opportunities are abundant and the wage compensation is significant, especially compared to other occupations that require a similar education background.

In general, however, many of the occupations with the greatest gains in employment in the Fifth District are not at the higher end of the compensation scale. Other occupations that stand to gain large numbers from 2008 to 2018 include food preparers, home health aides, retail sales persons, and customer service representatives.

Many occupations will experience an outright decline in the number employed and perhaps a sharp contraction in their rate of growth. In the Fifth District, these occupations are employed primarily in industries that have been experiencing structural decline over the past few decades. The textile and apparel industries, as well as furniture manufacturing, have been particularly pressured by foreign competition, but also by labor-saving technological progress. Occupations such as sewing machine operators and other operators of textile-related machinery will experience a continued decline in employment from 2008 to 2018. Most of the declining occupations are concentrated in the production group, both within the Fifth District and nationally. At a local level, communities struggle to provide employment opportunities to individuals who have lost their jobs through these structural changes. Workforce development agencies can use the occupational employment projections to help steer displaced workers in perhaps a more appropriate direction for retraining in occupations that have solid growth prospects.

Education and Training Requirements

As an important component of the occupational employment projections, the BLS assigns an education or training category to each occupation to indicate the most significant source of postsecondary education or training among workers who have become fully qualified in that occupation.
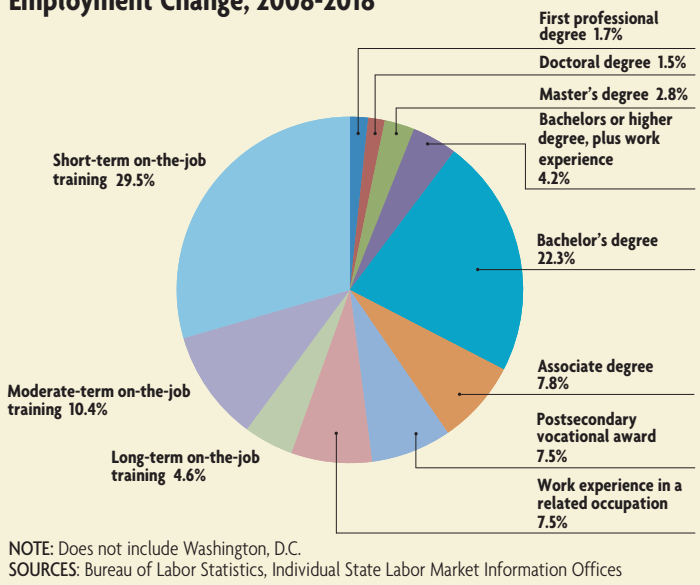
The education-related categories include first professional degree, doctoral degree, master's degree, bachelor's degree plus work experience, bachelor's degree, associate degree, and postsecondary vocational award. The postsecondary vocational award refers to certificates or awards that can be earned in as long as a year or as short as a few weeks. The other education categories match the definitions used in the Census Bureau's educational attainment data or other sources of education statistics.

The work-related training categories include work in a related occupation, which mainly applies to supervisors or managers, and on-the-job training, which varies in length and accompanying instruction. Short-term on-the-job training applies to occupations in which the skills needed to be fully qualified can be acquired during one month or less of on-the-job experience and a short demonstration of job duties. Moderate-term on-the-job training involves a period of one to 12 months of on-the-job experience combined with informal training to be considered fully qualified in the occupation. Finally, long-term on-the-job training requires more than 12 months of on-the-job experience and formal classroom instruction and may take the form of formal or informal apprenticeships that last several years.

Employment in occupations that involve some level of postsecondary award or degree made up about a third of national employment in 2008, but higher education will become increasingly important as nearly half of all new jobs expected to be created from 2008 to 2018 fall in this category. The same trend holds true for the Fifth District, where education at the level of a postsecondary award or degree will account for a third of expected employment in 2018, but nearly half of the *growth* in employment over the 10-year period (see the following charts). Indeed, a bachelor's degree will be the most significant source of education or training for 22 percent of the new jobs created from 2008 to 2018.

Most of the fastest-growing jobs in the Fifth District require at least a bachelor's degree and include such occupa-

Fifth District — Education and Training Requirements for Employment Change, 2008-2018

First professional degree 1.7%
Doctoral degree 1.5%
Master's degree 2.8%
Bachelors or higher degree, plus work experience 4.2%
Short-term on-the-job training 29.5%
Bachelor's degree 22.3%
Associate degree 7.8%
Postsecondary vocational award 7.5%
Work experience in a related occupation 7.5%
Moderate-term on-the-job training 10.4%
Long-term on-the-job training 4.6%

NOTE: Does not include Washington, D.C.
SOURCES: Bureau of Labor Statistics, Individual State Labor Market Information Offices

tions as biomedical engineers, network systems and data communications analysts, and financial examiners. The occupation predicted to grow the most in absolute terms in the Fifth District, registered nurses, requires at least an associate's degree to be fully qualified. Nonetheless, there will still be many jobs that require only short-term on-the-job training, as this category will account for 36 percent of projected employment in the Fifth District in 2018 and 30 percent of employment growth from 2008 to 2018.
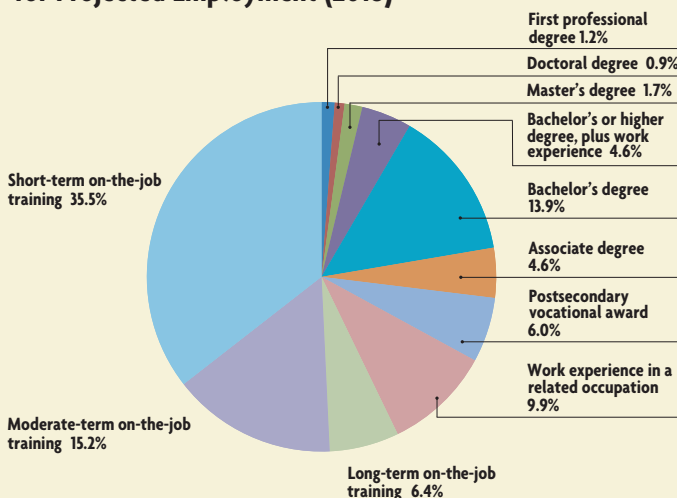
As noted earlier, jobs requiring a higher level of education and training earn a higher median wage. Nationally, jobs requiring a bachelor's degree paid a median wage of $57,770 in 2008, while jobs that required only short-term on-the-job training paid $21,320. Several occupations predicted to gain in great numbers in the Fifth District fall in the category of short-term on-the-job training, including food preparers and servers, home health aides, and retail salespersons.

Conclusion

As a faster pace of job gains likely takes hold this year, the labor market will quickly reveal which occupations are in highest demand. It is equally important, however, to look further ahead to understand the longer-term changes in our economy as they relate to the demand for specific occupations. Projections from the BLS provide 10-year industry and occupation projections at the national level, while the individual efforts of state labor market information agencies produce state- and local-level projections.

In combination with information on education and training requirements, the occupational projections provide powerful information for individuals entering the labor market or considering a career change, as well as the counselors, advisers, and educational institutions who serve them. In addition, the long-term occupational employment projections provide a view of future labor demand so that local economic developers and providers of education and training can synchronize their efforts more effectively. **RF**

Fifth District — Education and Training Requirements for Projected Employment (2018)

First professional degree 1.2%
Doctoral degree 0.9%
Master's degree 1.7%
Bachelor's or higher degree, plus work experience 4.6%
Short-term on-the-job training 35.5%
Bachelor's degree 13.9%
Associate degree 4.6%
Postsecondary vocational award 6.0%
Work experience in a related occupation 9.9%
Moderate-term on-the-job training 15.2%
Long-term on-the-job training 6.4%

NOTE: Does not include Washington, D.C.
SOURCES: Bureau of Labor Statistics, Individual State Labor Market Information Offices

State Data, Q3:10

|	DC	MD	NC	SC	VA	WV
Nonfarm Employment (000s)	709.3	2,518.0	3,859.5	1,808.5	3,632.9	747.9
Q/Q Percent Change	-0.8	-0.2	-0.4	0.0	-0.2	0.2
Y/Y Percent Change	1.2	0.3	-0.5	0.4	0.3	1.0
Manufacturing Employment (000s)	1.2	114.3	431.6	207.5	229.8	49.2
Q/Q Percent Change	-7.7	-0.8	-0.1	0.2	-0.8	0.1
Y/Y Percent Change	-14.3	-2.0	-1.4	-0.8	-2.6	-0.1
Professional/Business Services Employment (000s)	149.3	386.0	484.7	217.7	649.9	61.0
Q/Q Percent Change	0.8	-0.1	1.1	2.1	0.5	0.8
Y/Y Percent Change	1.7	1.3	5.3	9.8	2.2	2.5
Government Employment (000s)	243.3	502.5	698.1	346.2	698.5	152.5
Q/Q Percent Change	-1.6	-0.3	-2.4	-1.6	-1.8	-1.1
Y/Y Percent Change	0.4	1.7	-1.3	-0.5	0.2	1.7
Civilian Labor Force (000s)	332.3	2,978.1	4,486.9	2,159.7	4,177.3	779.2
Q/Q Percent Change	-1.0	-0.1	-1.1	-0.3	-0.2	-0.5
Y/Y Percent Change	0.4	-0.5	-1.1	-0.6	-0.1	-2.2
Unemployment Rate (%)	9.8	7.4	10.1	11.0	6.8	9.2
Q2:10	9.9	7.4	10.8	11.2	7.0	8.8
Q3:09	10.0	7.4	11.0	11.7	7.1	8.4
Real Personal Income ($Mil)	38,232.6	256,038.4	306,949.6	138,294.7	324,061.8	54,408.5
Q/Q Percent Change	0.4	0.5	0.5	0.5	0.5	0.5
Y/Y Percent Change	2.7	1.8	3.1	2.9	2.1	2.3
Building Permits	235	3,124	8,485	3,371	6,079	423
Q/Q Percent Change	658.1	-10.0	-11.9	-14.9	6.7	-27.1
Y/Y Percent Change	44.2	29.5	-9.3	-22.8	12.4	-42.4
House Price Index (1980=100)	572.2	437.1	321.3	326.3	415.1	226.2
Q/Q Percent Change	2.1	1.5	0.4	0.9	0.9	-0.2
Y/Y Percent Change	2.5	-1.6	-2.6	-2.3	-1.2	1.0
Sales of Existing Housing Units (000s)	8.0	65.2	112.8	58.8	103.2	24.4
Q/Q Percent Change	-23.1	-24.2	-30.5	-30.7	-12.8	-14.1
Y/Y Percent Change	-9.1	-13.3	-21.2	-19.7	-17.0	-15.3

Nonfarm Employment
Change From Prior Year
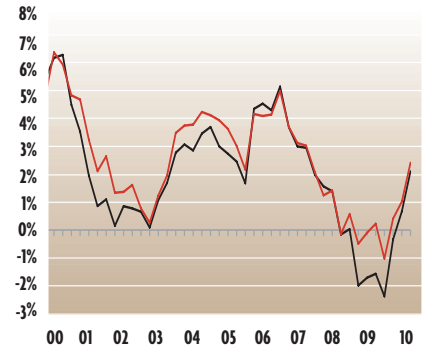First Quarter 2000 - Third Quarter 2010
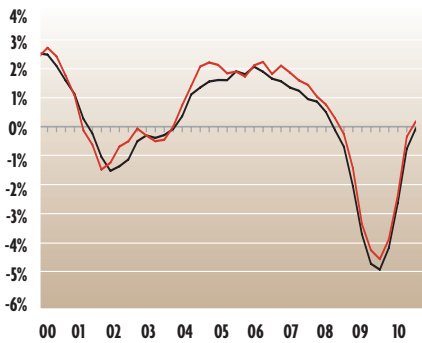
Unemployment Rate
First Quarter 2000 - Third Quarter 2010
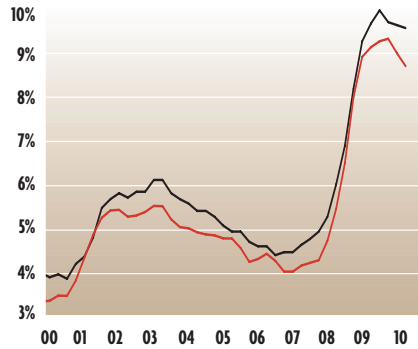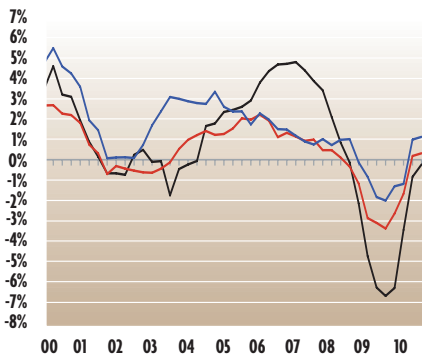

Real Personal Income
Change From Prior Year
First Quarter 2000 - Third Quarter 2010

— Fifth District   — United States

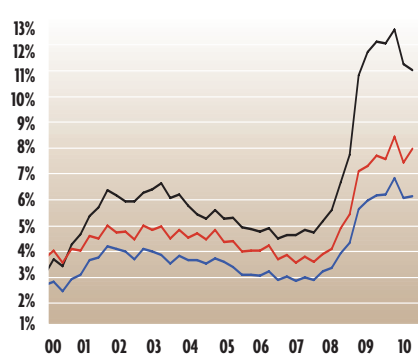## Nonfarm Employment
Metropolitan Areas
Change From Prior Year
First Quarter 2000 - Third Quarter 2010

— Charlotte   — Baltimore   — Washington
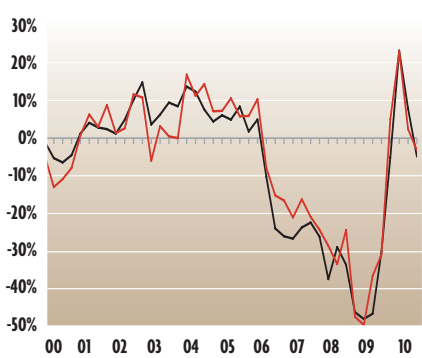
Unemployment Rate
Metropolitan Areas
Change From Prior Year
First Quarter 2000 - Third Quarter 2010

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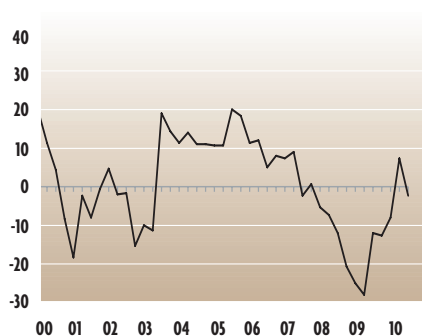
Building Permits
Change From Prior Year
First Quarter 2000 - Third Quarter 2010
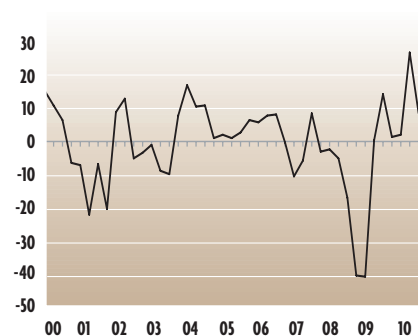

— Fifth District   — United States

FRB—Richmond
Services Revenues Index
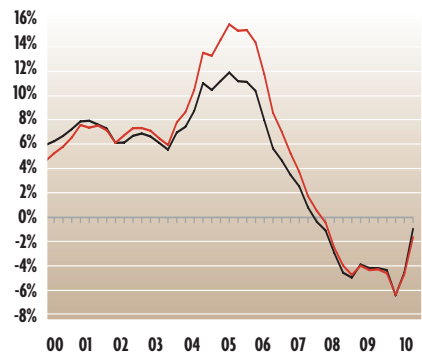First Quarter 2000 - Third Quarter 2010

FRB—Richmond
Manufacturing Composite Index
First Quarter 2000 - Third Quarter 2010

House Prices
Change From Prior Year
First Quarter 2000 - Third Quarter 2010

— Fifth District   — United States

NOTES:
1) 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, Q3:10

	Washington, DC	Baltimore, MD	Hagerstown-Martinsburg, MD-WV
Nonfarm Employment (000s)	2,417.5	1,276.0	97.4
Q/Q Percent Change	-0.1	-0.8	-0.7
Y/Y Percent Change	1.1	0.3	0.1
Unemployment Rate (%)	6.1	8.0	9.7
Q2:10	6.1	7.4	9.4
Q3:09	6.2	7.7	9.1
Building Permits	3,365	1,307	148
Q/Q Percent Change	6.6	-0.5	-45.4
Y/Y Percent Change	20.1	18.6	-28.8

	Asheville, NC	Charlotte, NC	Durham, NC
Nonfarm Employment (000s)	167.1	796.6	279.5
Q/Q Percent Change	-0.4	-1.1	-0.7
Y/Y Percent Change	0.5	-0.2	-0.6
Unemployment Rate (%)	7.9	11.0	7.2
Q2:10	8.5	11.2	7.4
Q3:09	8.9	12.1	8.3
Building Permits	552	1,235	628
Q/Q Percent Change	41.9	-27.5	24.4
Y/Y Percent Change	81.6	-38.1	57.8

	Greensboro-High Point, NC	Raleigh, NC	Wilmington, NC
Nonfarm Employment (000s)	338.9	498.4	137.9
Q/Q Percent Change	-0.5	0.2	-0.6
Y/Y Percent Change	-0.2	0.6	-0.7
Unemployment Rate (%)	10.3	8.1	9.3
Q2:10	10.8	8.4	9.7
Q3:09	11.6	9.1	10.1
Building Permits	536	1,305	407
Q/Q Percent Change	3.5	-16.7	-30.7
Y/Y Percent Change	-2.5	-2.0	-30.3

	Winston-Salem, NC	Charleston, SC	Columbia, SC
Nonfarm Employment (000s)	**202.5**	**284.5**	**340.9**
Q/Q Percent Change	-1.5	-0.4	-1.3
Y/Y Percent Change	-1.7	1.0	-0.6
Unemployment Rate (%)	**9.2**	**9.4**	**9.4**
Q2:10	9.6	8.8	8.8
Q3:09	10.2	10.2	9.9
Building Permits	**309**	**661**	**782**
Q/Q Percent Change	-1.3	-10.8	-7.1
Y/Y Percent Change	-6.1	-25.5	-3.6

	Greenville, SC	Richmond, VA	Roanoke, VA
Nonfarm Employment (000s)	**294.8**	**602.6**	**153.4**
Q/Q Percent Change	-0.5	-0.8	-1.8
Y/Y Percent Change	0.9	0.7	-0.5
Unemployment Rate (%)	**9.8**	**7.8**	**7.3**
Q2:10	9.5	7.7	7.3
Q3:09	11.1	7.8	7.5
Building Permits	**318**	**1,033**	**113**
Q/Q Percent Change	-16.1	0.4	-19.3
Y/Y Percent Change	-19.9	6.1	-3.4

	Virginia Beach-Norfolk, VA	Charleston, WV	Huntington, WV
Nonfarm Employment (000s)	**738.3**	**148.7**	**113.4**
Q/Q Percent Change	-0.3	0.4	-1.3
Y/Y Percent Change	-0.3	0.4	0.4
Unemployment Rate (%)	**7.3**	**7.9**	**8.6**
Q2:10	7.3	7.8	8.3
Q3:09	7.0	7.1	8.2
Building Permits	**1,068**	**41**	**9**
Q/Q Percent Change	-8.1	20.6	12.5
Y/Y Percent Change	-10.1	-12.8	28.6

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