


| | | | |
|--|---|---|---|
| ECONOMIC DRIVERS  MANUFAC- TURING | EMPLOYMENT GROWTH RANK 2014-2016: 255 (4th quintile) 2014-2019: 293 (4th quintile) <i>Best=1, Worst=408</i> | RELATIVE COSTS LIVING: 93% BUSINESS: 84% <i>U.S.=100%</i> | VITALITY RELATIVE: 90% RANK: 252 <i>U.S.=100% Best=1, Worst=401</i> |
|--|---|---|---|

BUSINESS CYCLE STATUS **ANALYSIS**



STRENGTHS & WEAKNESSES

STRENGTHS

- » Low business costs and infrastructure are attractive to potential manufacturers.
- » Spillover growth from Chattanooga and Atlanta.

WEAKNESSES

- » Low per capita income and educational attainment.
- » High dependence on low-value manufacturing; few sustainable growth drivers.

FORECAST RISKS

SHORT TERM  LONG TERM 

RISK EXPOSURE 2015-2020 **180** 3rd quintile *Highest=1 Lowest=401*

UPSIDE

- » Airport and Wacker Chemie investments attract other high-tech manufacturers.
- » Housing rebounds more strongly and quickly than expected.

DOWNSIDE

- » Manufacturing provides less of a boost to growth than expected.
- » Low industry diversity leaves the economy more susceptible to external shocks.

MOODY'S RATING
Aa2 CITY AS OF FEB 08, 2013

Recent Performance. Cleveland's economy has slowed recently, largely because of sluggish growth in the factory sector. In 2014, total payrolls expanded by only 0.9%, compared with a 5% jump in 2013. The unemployment rate has been hovering around 6.4% for the past 12 months, about 1 percentage point higher than the national average. Manufacturing, the key economic driver in the metro area, has been stagnant since early 2014. Wage and salary growth is solid, about on par with the U.S. average, but it has not yet aided the housing recovery much, which still significantly lags that of the nation. The CoreLogic single-family house price index has not shown meaningful improvement in the past two years.

Manufacturing. Manufacturing will improve very modestly in the next two years before resuming its secular decline near the end of the decade. After a strong recovery from 2010 to 2013, manufacturing decelerated significantly in early 2014 and has trended flat since. However, this trend will not continue, as the stronger national economy will add a boost to the industry. Whirlpool, the largest employer in the metro area, will benefit from higher demand for housing-related products as the national housing market continues to improve. Another big manufacturer, Wacker Chemie, has just posted robust profits for 2014 and made plans for further investments and hiring in the area.

Housing. The housing market recovery will continue to underperform that of the nation in the next few years, but construction will recover to the pace that prevailed in CLD during the early 2000s. Average income growth was above the U.S. level in the past four years thanks to well-paying manufacturing jobs, but it has not translated to a stronger demand for houses; mortgage originations have remained flat. Sluggish demand has hindered house price appreciation. In 2014,

the CoreLogic single-family house price appreciated by a mere 0.2%, compared with a U.S. average of 7.4% and a state average of 5.4%. Slow house price appreciation in turn discourages further investment in the housing market. Housing permits have flattened out since 2010.

As the labor market improves and mortgage credit availability loosens, homebuilding is expected to pick up. The key factor that will support the recovery is household growth that exceeds the U.S. and state averages, since CLD serves as a bedroom community to the more vibrant Chattanooga metro area.

Challenges. Heavy reliance on manufacturing will hinder the metro area's growth potential. CLD is one of the least diverse metro areas in the nation and its diversity has barely improved during the past few decades. Overdependence on manufacturing leaves the economy very susceptible to national economic woes. Meanwhile, most service growth is concentrated in low-paying consumer services. Because the percentage of those older than 25 in possession of a bachelor's degree is less than half of the U.S. average, CLD has not been able to develop other kinds of services. The presence of Lee University has not contributed much to the pool of educated labor because graduates leave the metro area for better opportunities elsewhere.

Cleveland's economy will improve in 2015 as the needs of the expanding population spur expansions in service industries and housing. High-profile investments from major manufacturers such as Whirlpool will contribute little to job growth but will support income and output growth. CLD is expected to lag the U.S. in terms of job gains but commuters and manufacturing earnings will support average income increases.

Shu Deng March 2015 *1-866-275-3266 help@economy.com*

| 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | INDICATORS | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|-------|-------|-------|-------|-------|-------|----------------------------------|-------|-------|-------|-------|-------|-------|
| 3.4 | 3.4 | 3.5 | 3.9 | 3.9 | 4.2 | Gross metro product (C09\$ bil) | 4.3 | 4.4 | 4.5 | 4.6 | 4.6 | 4.7 |
| -2.7 | 1.8 | 3.4 | 8.5 | 0.4 | 7.5 | % change | 2.6 | 2.8 | 2.0 | 1.8 | 1.3 | 1.1 |
| 39.3 | 38.8 | 40.0 | 42.8 | 45.0 | 45.4 | Total employment (ths) | 46.2 | 47.1 | 47.7 | 48.0 | 48.1 | 48.1 |
| -3.6 | -1.2 | 2.9 | 7.2 | 4.9 | 0.9 | % change | 1.9 | 2.0 | 1.1 | 0.6 | 0.3 | 0.1 |
| 10.0 | 9.4 | 8.9 | 7.5 | 7.2 | 6.1 | Unemployment rate (%) | 6.0 | 5.9 | 5.6 | 5.5 | 5.5 | 5.7 |
| -0.9 | 3.6 | 6.2 | 9.3 | 2.3 | 4.9 | Personal income growth (%) | 5.7 | 6.6 | 6.1 | 5.3 | 4.2 | 3.7 |
| 38.3 | 38.2 | 38.6 | 39.8 | 42.1 | 44.1 | Median household income (\$ ths) | 45.3 | 46.8 | 48.5 | 50.1 | 51.5 | 52.7 |
| 115.1 | 116.0 | 116.7 | 117.7 | 118.5 | 119.7 | Population (ths) | 120.8 | 121.9 | 123.1 | 124.3 | 125.5 | 126.7 |
| 0.7 | 0.8 | 0.6 | 0.9 | 0.7 | 1.0 | % change | 0.9 | 0.9 | 1.0 | 1.0 | 1.0 | 1.0 |
| 0.5 | 0.7 | 0.6 | 0.9 | 0.6 | 1.0 | Net migration (ths) | 1.0 | 1.0 | 1.1 | 1.1 | 1.1 | 1.1 |
| 262 | 267 | 303 | 351 | 409 | 443 | Single-family permits (#) | 470 | 593 | 595 | 574 | 543 | 511 |
| 89 | 283 | 73 | 59 | 42 | 44 | Multifamily permits (#) | 80 | 97 | 80 | 59 | 56 | 55 |
| 110.3 | 110.0 | 109.9 | 115.1 | 122.9 | 127.5 | Existing-home price (\$ ths) | 131.3 | 134.3 | 136.1 | 137.5 | 140.9 | 146.1 |

ECONOMIC HEALTH CHECK

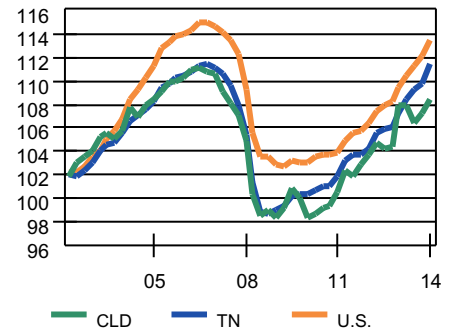
3-MO MA

| | Sep 14 | Oct 14 | Nov 14 | Dec 14 | Jan 15 | Feb 15 |
|---------------------------------------|---------------------------|------------------------------|------------------------------|------------------------------|--------------------------|--------------------------|
| Employment, change, ths | -0.1 | 0.0 | 0.1 | 0.2 | 0.3 | 0.2 |
| Unemployment rate, % | 6.2 | 6.2 | 6.2 | 6.2 | 6.4 | 6.4 |
| Labor force participation rate, % | 56.9 | 56.7 | 56.8 | 56.8 | 57.4 | 57.7 |
| Employment-to-population ratio, % | 53.2 | 53.1 | 53.1 | 53.1 | 53.6 | 54.0 |
| Average weekly hours, # | 32.4 | 32.4 | 32.2 | 32.4 | 33.0 | 33.6 |
| Industrial production, 2007=100 | 90.4 | 90.8 | 91.3 | 91.4 | 91.4 | 91.2 |
| Residential permits, single-family, # | 497 | 471 | 430 | 473 | 435 | 342 |
| Residential permits, multifamily, # | 53 | 42 | 41 | 59 | 37 | 111 |
| | Better than prior 3-mo MA | Unchanged from prior 3-mo MA | Unchanged from prior 3-mo MA | Unchanged from prior 3-mo MA | Worse than prior 3-mo MA | Worse than prior 3-mo MA |

Sources: BLS, Census Bureau, Moody's Analytics

BUSINESS CYCLE INDEX

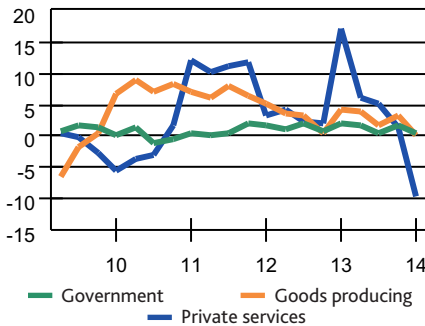
JAN 2002=100



Source: Moody's Analytics

CURRENT EMPLOYMENT TRENDS

% CHANGE YR AGO



Sources: BLS, Moody's Analytics

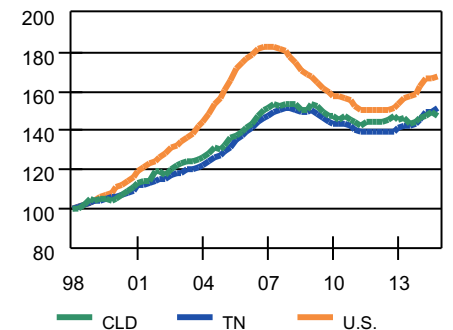
% CHANGE YR AGO, 3-MO MA

| | Jun 14 | Oct 14 | Feb 15 |
|-----------------------|--------|--------|--------|
| Total | 3.7 | 0.6 | -2.4 |
| Construction | 9.2 | 22.1 | 20.1 |
| Manufacturing | 0.5 | -0.0 | -3.0 |
| Trade | 5.5 | 2.0 | 2.0 |
| Trans/Utilities | 1.1 | 5.7 | 11.9 |
| Information | -0.2 | 0.3 | -0.1 |
| Financial Activities | 4.9 | 5.4 | 4.8 |
| Prof & Business Svcs. | 26.8 | -6.0 | -22.5 |
| Edu & Health Svcs. | -5.7 | -1.3 | -0.1 |
| Leisure & Hospitality | 1.2 | -0.4 | -2.3 |
| Other Services | -0.2 | -1.3 | -0.1 |
| Government | 0.5 | 1.5 | 1.0 |

Sources: BLS, Moody's Analytics

HOUSE PRICE

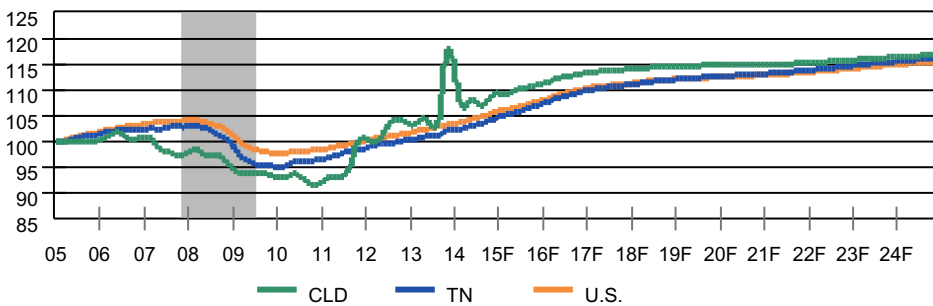
1998Q1=100, NSA



Sources: FHFA, Moody's Analytics

RELATIVE EMPLOYMENT PERFORMANCE

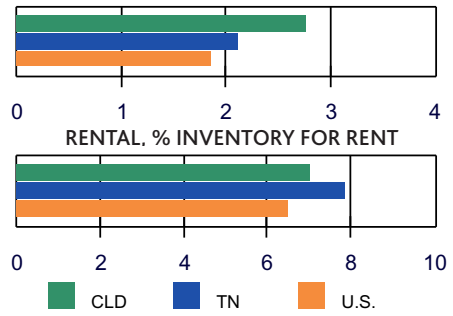
JAN 2005=100



Sources: BLS, Moody's Analytics

VACANCY RATES

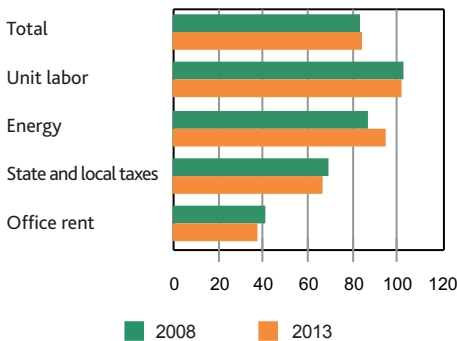
HOMEOWNER, % HOUSES FOR SALE



Sources: Census Bureau, ACS, Moody's Analytics, 2013

BUSINESS COSTS

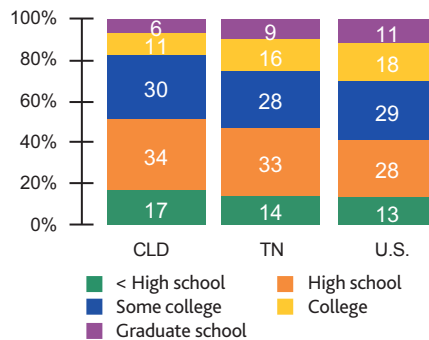
U.S.=100



Source: Moody's Analytics

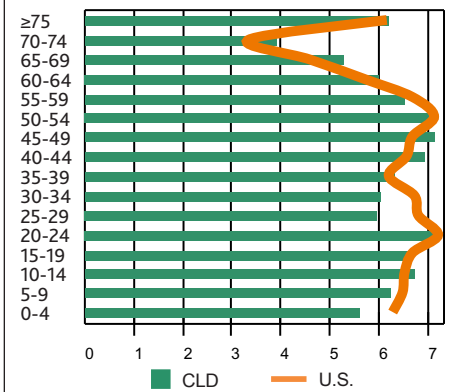
EDUCATIONAL ATTAINMENT

% OF ADULTS 25 AND OLDER



Sources: Census Bureau, Moody's Analytics, 2013

POPULATION BY AGE, %



Sources: Census Bureau, Moody's Analytics, 2013

EMPLOYMENT & INDUSTRY

TOP EMPLOYERS

| | |
|------------------------------|-------|
| Whirlpool Corp. | 1,761 |
| SkyRidge Medical Center | 1,147 |
| Peyton's Southeastern | 950 |
| Lee University | 815 |
| AT&T | 780 |
| Abitibowater Inc. | 643 |
| Wal-Mart Stores Inc. | 640 |
| Amazon | 600 |
| Merck & Co. | 537 |
| Masterfoods USA | 495 |
| Life Care Centers of America | 450 |
| Olin Corp. | 384 |
| Procter & Gamble | 350 |
| Charleston Hosiery Inc. | 350 |
| Exel Inc. | 340 |
| Eaton Cutler-Hammer Inc. | 325 |
| Johnston Coca-Cola | 320 |
| Lonza | 320 |
| Cleveland Chair Co. | 300 |
| Newell Rubbermaid | 290 |

Sources: Cleveland / Bradley Chamber of Commerce, 2013, Tennessee Department of Economic and Community Development, 2010

PUBLIC

| | |
|---------|-------|
| Federal | 300 |
| State | 724 |
| Local | 4,741 |

INDUSTRIAL DIVERSITY

Most Diverse (U.S.)

Least Diverse

EMPLOYMENT VOLATILITY

| Due to U.S. fluctuations | Relative to U.S. | | | | | | | | |
|---|------------------|-----|-------------|-----|--|-----|-----|------|-----|
| <table border="1"> <tr><td>Not due to U.S.</td><td>44%</td></tr> <tr><td>Due to U.S.</td><td>56%</td></tr> </table> | Not due to U.S. | 44% | Due to U.S. | 56% | <table border="1"> <tr><td>CLD</td><td>203</td></tr> <tr><td>U.S.</td><td>100</td></tr> </table> | CLD | 203 | U.S. | 100 |
| Not due to U.S. | 44% | | | | | | | | |
| Due to U.S. | 56% | | | | | | | | |
| CLD | 203 | | | | | | | | |
| U.S. | 100 | | | | | | | | |

Legend: Not due to U.S. (Green), Due to U.S. (Orange), CLD (Dark Green), U.S. (Light Orange)

MIGRATION FLOWS

INTO CLEVELAND TN

| | NUMBER OF MIGRANTS |
|---------------------------|--------------------|
| Chattanooga TN | 898 |
| Dalton GA | 151 |
| Knoxville TN | 71 |
| Nashville TN | 52 |
| Atlanta GA | 36 |
| Cape Coral FL | 35 |
| Memphis TN | 29 |
| Tampa FL | 27 |
| Detroit MI | 25 |
| North Port FL | 18 |
| Total in-migration | 4,414 |

FROM CLEVELAND TN

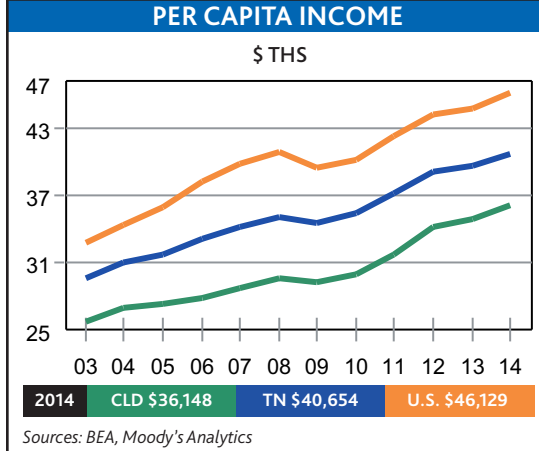
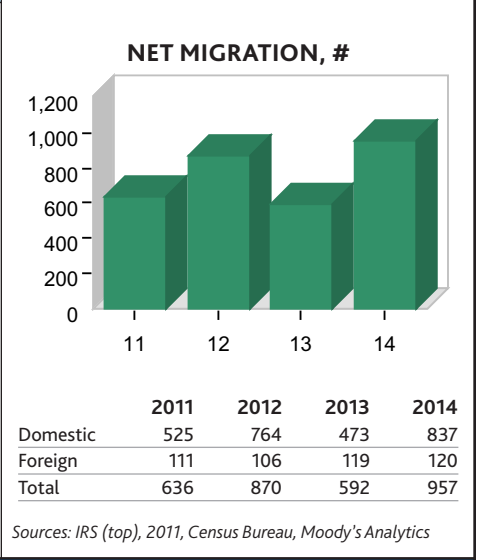
| | |
|----------------------------|--------------|
| Chattanooga TN | 831 |
| Dalton GA | 172 |
| Knoxville TN | 107 |
| Nashville TN | 62 |
| Atlanta GA | 37 |
| Memphis TN | 29 |
| Orlando FL | 18 |
| Tampa FL | 17 |
| Total out-migration | 4,221 |

Net migration **193**

COMPARATIVE EMPLOYMENT AND INCOME

| Sector | % of Total Employment | | | Average Annual Earnings | | |
|----------------------------|-----------------------|-------|-------|-------------------------|----------|-----------|
| | CLD | TN | U.S. | CLD | TN | U.S. |
| Mining | 0.1% | 0.1% | 0.6% | \$27,955 | \$35,561 | \$103,753 |
| Construction | 3.8% | 3.8% | 4.4% | \$50,360 | \$58,647 | \$60,444 |
| Manufacturing | 20.0% | 11.5% | 8.8% | \$66,482 | \$67,829 | \$77,051 |
| Durable | 58.5% | 63.2% | 63.1% | nd | \$58,760 | \$78,697 |
| Nondurable | 41.5% | 36.8% | 36.9% | nd | \$71,247 | \$74,316 |
| Transportation/Utilities | 5.7% | 5.3% | 3.7% | nd | \$57,474 | \$64,339 |
| Wholesale Trade | 1.9% | 4.4% | 4.2% | nd | \$71,833 | \$81,024 |
| Retail Trade | 11.6% | 11.4% | 11.1% | \$30,222 | \$32,954 | \$33,130 |
| Information | 0.7% | 1.6% | 2.0% | nd | \$61,705 | \$102,915 |
| Financial Activities | 3.0% | 5.0% | 5.7% | \$31,886 | \$47,581 | \$52,549 |
| Prof. and Bus. Services | 12.7% | 13.2% | 13.7% | \$31,861 | \$52,804 | \$64,145 |
| Educ. and Health Services | 13.0% | 14.3% | 15.4% | nd | \$66,627 | \$51,580 |
| Leisure and Hosp. Services | 10.3% | 10.5% | 10.6% | \$18,723 | \$23,129 | \$24,893 |
| Other Services | 4.5% | 3.8% | 4.0% | nd | \$33,969 | \$35,425 |
| Government | 12.7% | 15.1% | 15.7% | \$52,420 | \$61,355 | \$72,104 |

Sources: Percent of total employment — BLS, Moody's Analytics, 2014, Average annual earnings — BEA, Moody's Analytics, 2013



HIGH-TECH EMPLOYMENT

| | Ths | % of total |
|------|---------|------------|
| CLD | 0.9 | 2.1 |
| U.S. | 6,553.6 | 4.7 |

HOUSING-RELATED EMPLOYMENT

| | Ths | % of total |
|------|----------|------------|
| CLD | 3.1 | 6.9 |
| U.S. | 12,757.9 | 9.2 |

Source: Moody's Analytics, 2014

LEADING INDUSTRIES BY WAGE TIER

| NAICS Industry | Location Quotient | Employees (ths) |
|---|-------------------|-----------------|
| 6211 Offices of physicians | 1.0 | 0.8 |
| 3251 Basic chemical manufacturing | 12.4 | 0.6 |
| 5511 Management of companies & enterprises | 0.6 | 0.4 |
| 3353 Electrical equipment manufacturing | 8.4 | 0.4 |
| 4931 Warehousing and storage | 5.3 | 1.3 |
| 6231 Nursing care facilities | 1.7 | 0.9 |
| 6221 General medical and surgical hospitals | 0.6 | 0.9 |
| 4841 General freight trucking | 2.4 | 0.8 |
| GVL Local Government | 1.1 | 4.9 |
| 7225 Restaurants and other eating places | 1.2 | 3.8 |
| 5613 Employment services | 2.7 | 3.1 |
| 3352 Household appliance manufacturing | 123.0 | 2.4 |

Source: Moody's Analytics, 2014

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A Business Cycle Status

The business cycle status identifies the stage of the business cycle that characterizes an area's recent performance. There are five categories: in recession, moderating recession, expansion, recovery and at risk. The evaluation of status is based on a six-month test of either contraction or expansion. The six-month test compares the six-month moving average of the business cycle index in the current period with the six-month moving average in the period six months ago. An area is "in recession" if the six-month test shows contraction. "Moderating recession" refers to persistent contraction but with the pace abating. If a trough has been reached, the economy shifts from recession to "recovery." Once the business cycle indicator reaches a peak, the area is in "expansion." If it appears that a local peak may have been reached and the business cycle indicator is increasing but at a decreasing rate, then the economy is placed "at risk." At risk indicates that the economy could slip from expansion or recovery to recession if the index has fallen but for less than six months.

B Employment Growth Rank

These numbers represent the ranking of all 392 metro areas and divisions of short-term employment growth (over the next two years, top) and long-term growth (over the next five years, bottom). The actual expected short-term and long-term employment growth rates can be found on Page 6.

FYI: Depending on the distribution of the forecast growth rates, large differences in metro area forecast rankings may or may not indicate large differences in metro area forecast growth rates. For the current distribution of metro area employment growth rates, see Page 7.

C Relative Costs

Cost of Living

The cost of living index measures the relative cost to the average household in the nation to maintain its standard of living in each metropolitan area. The index is created by summing expenditures on various components of consumption in each metro area relative to average U.S. expenditures on the components. The components that vary across metro areas include housing, food and apparel, utilities, transportation, and auto insurance.

Cost of Doing Business

In order to better gauge regional economic prospects, Moody's Analytics has developed a cost of doing business index for each metro area. The relative business cost index is composed of labor costs, energy costs, tax burdens, and office rent costs. **Labor costs** are measured by unit labor costs, or earnings per dollar of output. Unit labor costs are determined for each three-digit NAICS industry for each metro area and compared with unit labor costs for the same industries nationally. **Energy costs** are measured by average cents per kilowatt-hour (Kwh) charged to commercial and industrial users. **Tax burdens** are measured by city and county revenues within the metro area and expressing their sum as a percent of total personal income in each metro area. Business contributions to unemployment and workman's compensation programs are also included in the tax measure because they represent costs for labor hired. **Office costs** are measured as the average price paid per square foot for class A office space. In the overall business cost index, a state-specific component weight system has been adopted to more accurately account for an area's business cost structure. State-specific weights were generated by analyzing inter-industry capital flows via IMPLAN modeling software. Metro areas within a state use the state's weight structure, which is modified to include metro area-specific office rent costs. On average across all metro areas, tax burdens have a 7% weight, energy a 15% weight, unit labor costs a 51% weight, and office rent costs a 28% weight. The index is configured so that the cost of doing business nationally equals 100. Thus, a metro area with a cost index of 110 has business costs 10% above the national average; an index of 90 means a metro area has business costs 10% below the national average.

FYI: Differences in the cost of doing business across regions are an important long-term determinant of regional economic performances.

D Risk Exposure

Risk exposure represents the extent to which a metro area economy's employment growth forecast will be vulnerable to upside or downside fluctuations in the upcoming five-year period. The ranking reflects the expected employment volatility associated with a specific metro area, with a higher ranking—and higher quintile—denoting greater risk. It is important to keep in mind that the ranking represents the relative potential for variation from the forecast; this can be to the upside or downside. A metro area in the first quintile,

for example, faces a much wider range of potential outcomes than one in the fifth quintile, which is unlikely to deviate significantly from the forecast.

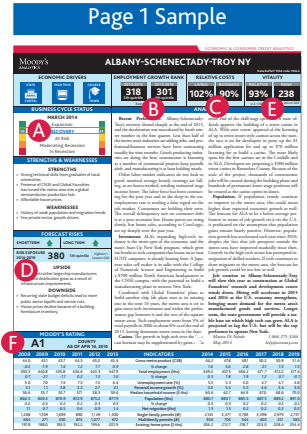
There are seven determinants of metro area risk exposure: (1) investment income dependence, (2) metro area size, (3) the prior year's change in population, (4) education and healthcare share of output, (5) government share of output, (6) finance share of output, and (7) house price volatility, based on the change in the ratio of median house price to per capita income.

Risk exposure should be considered in combination with a metro area's expected growth rate in order to ascertain the level of certainty associated with an employment growth forecast. Metro areas with high growth rates and low volatility rankings represent those that are the safest in terms of expected growth, while those with low growth rates and high volatility are most exposed to highly negative results.

See Regional Financial Review, "Measuring Regional Uncertainty: An Update of Risk-Adjusted Return," March 2013, for more details.

E Vitality Index

The Moody's Analytics vitality index can be used to assess a metro area's long-term economic potential. The index abstracts from business cycle fluctuations and near-term economic events. Only persistent forces of economic strength or weakness are considered. To maintain a long-term focus, the vitality index was created with the purpose of predicting the average annual growth rate in an area's gross domestic product over the next 10 years. This index presents



| Indicator | Units | Source | Note |
|-------------------------|------------------------|-----------------------------------|--|
| Gross Metro Product | Chain-weighted dollars | BEA, Moody's Analytics | GMP is the sum of all income produced in a metro area, including corporate profits. Thus, it does not necessarily track employment growth. |
| Total Employment | Ths | BLS Current Employment Statistics | Defined as sum of mining, construction, manufacturing, transportation/utilities, trade, information, financial activities, professional and business, education and health, leisure and hospitality, and other services, and government. |
| Unemployment Rate | % | BLS Current Population Survey | |
| Personal Income Growth | % change previous yr | Bureau Economic Analysis | Measures income received by households from employment (including self), investments and transfer payments. |
| Median Household Income | \$ ths | Census Bureau | |
| Population | Ths | Census Bureau | |
| Net Migration | Ths | Census Bureau | Calculated as number of domestic and international people moving into a metro area minus those leaving. |
| Single-Family Permits | Number of units | Census Bureau | |
| Multifamily Permits | Number of units | Census Bureau | |
| Existing-Home Price | 1980Q1=100 | FHFA | Index is not affected by mix of homes sold. |

a quantitative alternative to the Moody's Analytics regional forecasts, which are determined not only by econometric modeling but also by the qualitative judgment of regional analysts. The following four factors make up the vitality index: (1) industrial structure, (2) excess labor supply, (3) labor force quality, and (4) labor force growth. An index was generated for each of these components. A value of 100 indicates that the component in the metro area's economy matches the component's value nationally; values above 100 indicate that the component in the metro area's economy is above average, and those below 100 indicate the component is below average.

The index for industrial structure is called the industrial vitality index. The three labor inputs are reconciled into a single labor force vitality index in which values of 100 also correspond to the national average. The labor force vitality index is then combined with the industrial vitality index to produce the metro area's vitality index. Industrial vitality was assigned a 55% weight, and labor force vitality

is assigned a 45% weight. These were assigned to achieve maximum correlation between predicted GDP growth and actual GDP growth as determined by regression analysis. A vitality index value of 100 is consistent with the nation. Values above 100 suggest there is potential for faster growth, and those below 100 suggest the possibility for slower growth.

See Regional Financial Review, "U.S. Regional Diversity, Volatility and Vitality," November 2012 for a detailed explanation.

F Moody's Bond Rating

This is the bond rating for general obligation bonds issued by a principal city or county government. Not all city and county governments issue GO bonds and thus some metro areas will have an "NA" here. The interpretation of the bond rating is as follows:

| | |
|-----|---|
| Aaa | Best quality, smallest degree of investment risk |
| Aa | High quality, margins of protection not as large as in Aaa |
| A | Upper medium grade obligations, adequately secured |
| Baa | Medium grade obligations, neither highly protected nor poorly secured |
| Ba | Speculative, future cannot be considered as well assured |
| B | Lacking characteristics of desired investment |

The modifier 1 indicates that the issue ranks in the higher end of its generic category; the modifier 2 indicates a midrange ranking; and the modifier 3 indicates that the issue ranks in the lower end of its generic category.

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G Current Employment Trends

Employment is organized into three sectors: government, private service producing industries, and goods producing industries.

The year-over-year growth of payroll employment for the most recent month compared with four months prior and eight months prior, corresponding to the previous two issues of the Metro Précis reports, enables the users to track the performance of a metro area's labor market from issue to issue. In addition to total payroll employment, data are available for all Bureau of Labor Statistics-defined "super sectors." In some smaller metro areas, some of the super sector data are estimated by Moody's Analytics because they are not released by the BLS.

H Economic Health Check

A heat map made up of high-frequency indicators provides insight into the factors that explain an area's recent performance. The indicators considered are all produced in monthly frequency. In order to smooth out month-to-month fluctuations, the three-month moving average is calculated and compared with the three-month moving average in the prior month. If the change is positive, the cell is shaded green, if no change took place, the cell is shaded yellow, and if the change is negative, the cell is shaded orange. The high-frequency indicators include the change in payroll employment; change in the unemployment rate, where a lower rate connotes improvement; the labor force participation rate, defined as the share of the working-age noninstitutional population older than 16 either looking for work or employed; industrial production; single-family residential permits; and multifamily residential permits. The metro industrial production index is estimated using national-level industrial production and metro-level industry employment.

I Educational Attainment

The Census Bureau provides data on the educational attainment of residents older than 25 years of age of metro areas and their component counties, states, and the U.S. Educational attainment reflects the industrial composition of an area as well as the prospects that an area has in expanding its industries.

K House Prices

FHFA Conventional and Conforming Home Price Index. The Federal Housing Finance Agency (FHFA) estimates and publishes quarterly house price indexes for single-family detached properties using data on conventional conforming mortgage transactions obtained from the Federal Home Loan Mortgage Corp. (Freddie Mac) and the Federal National Mortgage Association (Fannie Mae). These indexes use a repeat-purchase method, which is not affected by the mix of homes sold. For example, using traditional house price measures, a rise in the number of low-priced homes sold relative to higher-priced homes will bias house prices downward even though relative prices may not have changed. Because repeat-purchase house price indexes keep track of successive selling prices for the same property, they avoid this bias. Freddie Mac and Fannie Mae are private corporations with federal charters whose mandate is to provide liquidity to the nation's residential mortgage market. The FHFA was created by the Housing and Economic Recovery Act of 2008. The FHFA is the regulator of Fannie Mae, Freddie Mac, and the Federal Home Loan Banks. This law combined the staffs of the Office of Federal Housing Enterprise Oversight (OFHEO), the Federal Housing Finance Board (FHFB), and the GSE mission office at the Department of Housing and Urban Development (HUD).

FYI: The House Price Index is based on transactions involving conforming, conventional mortgages purchased or securitized by Fannie Mae or Freddie Mac. Only mortgage transactions on single-family properties are included. A conforming mortgage is one that both meets the underwriting guidelines of Fannie Mae or Freddie Mac

and that does not exceed the conforming loan limit. The conforming limit for single-family homes is \$417,000 as of January 2014, with higher limits for high-cost metro areas. Conventional means that the mortgages are neither insured nor guaranteed by the FHA, VA, or other federal government entity. Because of the conforming limit, the FHFA repeat-purchase index is less reliable in those states, such as California, Connecticut and New Jersey, where many homes are typically priced above the purchase limits.

L Population by Age

The Census Bureau provides data on population by age for metro areas and their component counties, states, and the U.S. A distribution that differs significantly from the national distribution has implications for the labor, housing and consumer markets in an area. For example, a distribution skewed toward older cohorts implies higher than average demand for healthcare services and lower than average demand for single-family housing.

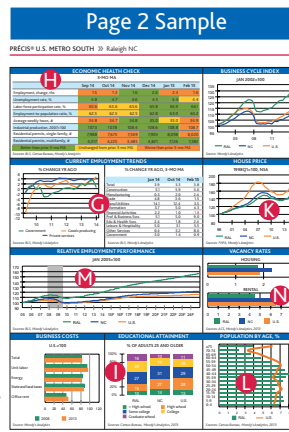
M Relative Employment Performance

In order to compare the performance of a metro area's labor market with that of the U.S. and the broad region, an index is calculated in which the value of the Bureau of Labor Statistics payroll employment in the first quarter of 10 years prior to the current year is set at 100. Forecast data for the next five years are also provided. The shaded gray bar represents the period of the 2008-2009 national recession.

N Vacancy Rates - Housing and Rental

The homeowner vacancy rate is the proportion of the homeowner housing inventory that is vacant for sale. It is computed by dividing the number of vacant units for sale only by the sum of owner-occupied units and vacant units that are for sale only and then multiplying by 100.

The rental vacancy rate is the proportion of the rental inventory that is vacant for rent. It is computed by dividing the number of vacant units for rent by the sum of the renter occupied units and the number of vacant units for rent and then multiplying by 100.



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○ Employment and industry Structure

Industrial Diversity

Industrial diversity is defined as the extent to which a metro area's industrial structure approximates the U.S. industrial structure.

Diversity is derived using the following formula:

$$\text{Diversity} = 1/\sum_i((\text{EMP}_{ij}/\text{EMP}_{US})^2 \cdot \text{EMP}_{ij})$$

Where EMP = share of employment in four-digit NAICS industry j during period 2010-12; i = metro area; US = U.S. The Diversity measure is bounded between 0 and 1. 1 means the metro area has the same industrial structure as the U.S.; 0 means it has a totally different industrial structure than the U.S.

Formula derived from Hachman index, Bureau of Business and Economic Research, Univ. of Utah, December 1994.

Employment Volatility

Employment volatility is defined as the standard deviation in a metro area's monthly year-over-year percentage nonagricultural employment growth relative to the standard deviation in U.S. year-over-year percentage nonagricultural employment growth over the 2002 to 2012 period. Volatility of 100 means that employment volatility in a metro area is equal to employment volatility in the nation. Metro areas tend to be inherently more volatile than states.

Employment Volatility Due to U.S. Fluctuations

Volatility due to U.S. fluctuations (also known as "systematic volatility") is defined as:

$$\text{SYSVOL} = (R_i^2)^{1/2}$$

where SYSVOL = systematic volatility; R_i^2 = is the proportion of total variance in metro area i's growth rate that is associated with contemporaneous fluctuations in national growth.

Volatility not due to U.S. fluctuations (also known as "nonsystematic volatility") is defined as:

$$\text{NONSYS} = 1 - (R_i^2)^{1/2}$$

where NONSYS = nonsystematic volatility in metro area i; R_i^2 is the proportion of total variance in metro area i's growth rate that is associated with contemporaneous fluctuations in national growth.

Formulas modified from "Assessing Regional Economic Stability: A Portfolio Approach," *Economic Review* (Federal Reserve Bank of San Francisco), Winter 1990.

○ High-Tech Related Employment

Moody's Analytics defines high-tech employment as the sum of employment in the following industries:

| NAICS | Industry |
|-------|---------------------------------------|
| 3254 | Pharm. & Medicine Manuf. |
| 3341 | Computer and Peripheral Equip. Manuf. |

| | |
|------|--|
| 3342 | Communications Equipment Manuf. |
| 3344 | Semi. & Other Elec. Comp. Manuf. |
| 3345 | Nav., Meas., Elec. and Control Instr. Manuf. |
| 3391 | Medical Equip. and Supplies Manuf. |
| 5112 | Software Publishers |
| 5171 | Wired Telecommunications Carriers |
| 5172 | Wireless Telecom. Carriers (except Sat.) |
| 5174 | Satellite Telecommunications |
| 5179 | Other Telecommunications |
| 5182 | Data Proc., Hosting, & Related Services |
| 5191 | Other Information Services |
| 5415 | Computer Sys. Design & Related Services |
| 5417 | Scientific Research and Dev. Services |
| 5419 | Other Prof., Scientific and Tech. Services |
| 6215 | Medical & Diagnostic Laboratories |

○ Housing-Related Employment

Moody's Analytics defines housing-related employment as the sum of employment in the following industries:

| NAICS | Industry |
|-------|--|
| 2361 | Residential Building Construction |
| 238 | Specialty Trade Contractors |
| 444 | Building Material and Garden Equipment and Supplies Dealers |
| 5617 | Services to Buildings and Dwellings |
| 5413 | Architectural, Engineering and Related Services |
| 522 | Credit Intermediation and Related Activities |
| 5312 | Offices of Real Estate Agents and Brokers |
| 4233 | Lumber and Other Construction Materials Merchant Wholesalers |
| 5313 | Activities Related to Real Estate |

○ Leading Industries by Wage Tier

To determine the high-, middle- and low-wage industries for a given geography, the average U.S. wage is calculated first by dividing total salary disbursements by total employment. Average wages by industry are calculated using U.S. level wage and employment data for all four-digit NAICS codes. Next, the standard deviation of the average wages across industries is calculated. One standard deviation centered at the mean defines the upper and lower bounds separating the high, middle and low tiers. The average wage in the given geography for each four-digit NAICS industry is calculated next. The industry is categorized as high, middle or low wage by comparing it with the national high and low cutoffs. The industries are then ranked by size.

For each industry, the location quotient is calculated. Location quotients are used to indicate whether the industry serves a market larger than that of the metro area or is an "export" industry. A location quotient greater than 1 likely indicates an export industry. Location quotients are calculated according to the formula:

$$LC_m^i = (E_m^i/E_m^t)/(E_{US}^i/E_{US}^t)$$

where LC = location quotient in metro area m for industry i; E = employment in industry i for metro area m or the U.S.; and t = total employment for metro area m or the U.S.

○ Migration Flows

IRS data. When a taxpayer notifies the IRS of a change in address, the IRS records the household's current county of residence, the county to which the household is moving, and the number of household members. Moody's Analytics aggregates these data by metro area into gross migration. The data are then sorted to show the 10 metro areas providing the largest number of new residents and the 10 metro areas to where the largest number of current residents moves. Subtracting the gross out-migration flows from the gross in-migration flows gives net out-migration.

The IRS migration data cover only households that file returns and thus do not provide a complete tally of domestic migration flows.

Census data.

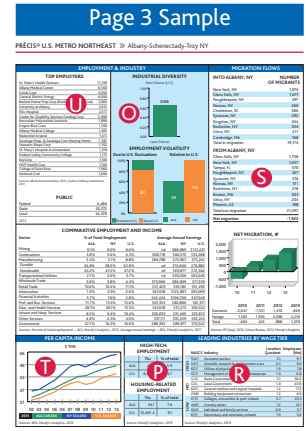
The Census measure of net migration attempts to capture all migration to and from counties. Unlike the IRS data, Census data cover all migrants, including international migrants. Moody's Analytics aggregates county net migration data to metro areas and to states. Domestic and international net migration were re-estimated for years 2001-2010, because the Census has no plans to do this. Pre-existing net migration estimates (derived from new census population estimates combined with constant birth and death rates) were used. The "weights" for domestic and international migration are the same as those that existed before.

○ Per Capita Income

Per capita income is defined as personal income divided by population. It is not adjusted for inflation.

○ Top Employers List

Moody's Analytics compiles top employers lists for every region for the most recent year available. Public sector employment, which is generally proportional to a metro area's population, is provided separately. However, the lists do include public establishments that are not found in every metro area such as military bases or specific federal agencies.



Region Definition

The Moody's Analytics definition of the Northeast differs from the Census Bureau's definition of the Northeast Census Region in that it includes Maryland, Delaware, and the District of Columbia in addition to Middle Atlantic and New England states. The Moody's Analytics definition of the South excludes Maryland, Delaware, and the District of Columbia. The Moody's Analytics definitions of the Midwest and West match the Census Bureau's definitions of the Midwest and West Census Regions, respectively.

Metro classifications



Agriculture

Metro areas with a high concentration of agriculture are those with a higher than average share of farm employment and farm income. In addition, such areas include a high share of food processing that is directly related to the agricultural produce in the area. Activities related to agriculture are either totally or partly included in the following industries as defined under the North American Industrial Classification System:

| | |
|------|--|
| FR | Farms |
| 311 | Food Manufacturing |
| 312 | Beverage and Tobacco Product Manufacturing |
| 4238 | Machinery, Equipment and Supplies Merchant Wholesalers |
| 4245 | Farm Product Raw Material Merchant Wholesalers |
| 4249 | Miscellaneous Nondurable Goods Merchant Wholesalers |
| 4442 | Lawn and Garden Equipment and Supplies stores |
| 4931 | Warehousing and Storage |



College Towns

Metro areas in this category are heavily reliant on a large university or universities for employment growth. They do not generally fluctuate in tandem with national business cycles and are usually more stable than other metro areas.



Defense

Metro areas in this category are heavily dependent on military bases and/or spending on defense-related manufacturing and services. The share of military employment in these areas is well above the national average, and consequently they generally have low industrial diversity levels. The most prominent upside risk these metro areas are faced with is the prospect of attracting defense-related firms in the private sector. However, any significant reduction in the number of military personnel will hurt the economies of these metro areas. Generally, these areas do not follow the national business cycle because of the limited importance of the private sector to the local economy. Defense-related manufacturing is also sensitive to changes in government spending priorities. As defined under the North American Industrial Classification System: Defense-related employment includes the following industries in addition to direct government employment, although some of these industries also include nondefense activities.

| | |
|------|---|
| GVFD | Department of Defense |
| 3329 | Ammunition, Small Arms, Other Ordnance and Accessories Manufacturing |
| 3341 | Computer and Peripheral Equipment Manufacturing |
| 3342 | Communications Equipment Manufacturing |
| 3345 | Navigational, Measuring, Electromedical and Control Instruments Manufacturing |
| 3364 | Aerospace Product and Parts Manufacturing |
| 3366 | Ship and Boat Building |
| 3369 | Armored Military Trucks |
| 4831 | Deep Sea, Coastal and Great Lakes Water Transportation |
| 5413 | Architectural, Engineering, Mapping Services |
| 5415 | Computer Systems Design |
| 5416 | Management, Scientific and Technical Consulting |
| 5417 | Scientific Research and Development |



Energy Production/Distribution Hubs

This category has a heavy concentration of firms involved in natural resource production and distribution. Commodity prices play a large role in employment trends in these metro areas. With developing countries' energy needs growing rapidly, demand for the products produced and distributed should remain high over the next few years. However, stricter carbon emission legislation does pose a downside risk to employment growth.

Energy production/distribution hubs were identified by the energy/mining/utilities employment location quotient. Energy/mining/utilities employment is defined as the aggregate of employment in the following industries, as defined under the North American Industrial Classification System:

| | |
|------|--|
| 2111 | Oil and Gas Extraction |
| 2121 | Coal Mining |
| 2122 | Metal Ore Mining |
| 2123 | Nonmetallic Mineral Mining and Quarrying |
| 2211 | Electric Power Generation, Transmission and Distribution |
| 2212 | Natural Gas Distribution |
| 2131 | Support Activities for Mining |
| 2213 | Water, Sewage and Other Systems |
| 3241 | Petroleum and Coal Products Manufacturing |
| 486 | Pipeline Transportation |



Federal Government-Nondefense

Areas with a dependence on the federal government include a high share of federal government employment as well as high exposure to nondefense-related federal government contracts. Such areas have generally been stable, but more recently they have been vulnerable to changing federal government spending priorities, particularly cuts in the growth of government spending. It is difficult to isolate private industries since many industries can receive government contracts.



Financial Centers

Metro areas in this category have a relatively large concentration of non-real estate related employment in financial services and are heavily dependent upon the health of global equity and credit markets. Rapid economic growth in developing countries has given a larger percentage of the world's population greater access to financial markets, particularly equity markets. Jobs in these industries generally pay high salaries.

Financial centers are identified by the financial employment location quotient. Financial employment is defined as the aggregate of employment in the following industries, as defined under the North American Industrial Classification System:

| | |
|------|--|
| 5211 | Monetary Authorities-Central Bank |
| 5221 | Depository Credit Intermediation |
| 5222 | Nondepository Credit Intermediation |
| 5223 | Activities Related to Credit Intermediation |
| 5239 | Other Financial Investment Activities |
| 5511 | Management of Companies and Enterprises |
| 5231 | Securities and Commodity Contracts Intermediation and Brokerage |
| 5232 | Securities and Commodity Exchanges |
| 5241 | Insurance Carriers |
| 5242 | Agencies, Brokerages, and Other Insurance-Related Activities |
| 5251 | Insurance and Employee Benefit Funds |
| 5259 | Other Investment Pools and Funds |
| 5331 | Lessors of Nonfinancial Intangible Assets (except Copyrighted Works) |
| 8132 | Grantmaking and Giving Services |



Logistics

Metro areas in this category are heavily influenced by domestic and global business cycles. Slowdowns in overall economic activity generally influence these areas to a greater degree than most other metro areas. Areas with more extensive exposure to developing economies, either through the presence of deep sea ports or air transportation hubs, will outperform those that are more dependent on the U.S. economy.

Transportation hubs were identified by the transportation and distribution employment location quotient. Transportation and distribution employment is defined as the aggregate of employment in the following industries, as defined under the North American Industrial Classification System:

| | |
|------|--|
| 4831 | Deep Sea, Coastal and Great Lakes Water Transportation |
| 4832 | Inland Water Transportation |
| 4883 | Support Activities for Water Transportation |
| 4885 | Freight Transportation Arrangement |
| 4882 | Support Activities for Rail Transportation |
| 4889 | Other Support Activities for Transportation |
| 4821 | Rail Transportation |
| 4841 | General Freight Trucking |
| 4931 | Warehousing and Storage |
| 4884 | Support Activities for Road Transportation |
| 4231 | Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers |
| 4232 | Furniture and Home Furnishing Merchant Wholesalers |
| 4233 | Lumber and Other Construction Materials Merchant Wholesalers |
| 4234 | Professional and Commercial Equipment and Supplies Merchant Wholesalers |
| 4235 | Metal and Mineral (except Petroleum) Merchant Wholesalers |
| 4236 | Electrical and Electronic Goods Merchant Wholesalers |
| 4237 | Hardware, Plumbing and Heating Equipment and Supplies Merchant Wholesalers |
| 4238 | Machinery, Equipment and Supplies Merchant Wholesalers |
| 4239 | Miscellaneous Durable Goods Merchant Wholesalers |
| 4251 | Wholesale Electronic Markets and Agents and Brokers |
| 4241 | Paper and Paper Product Merchant Wholesalers |
| 4242 | Drugs and Druggists' Sundries Merchant Wholesalers |
| 4243 | Apparel, Piece Goods and Notions Merchant Wholesalers |
| 4244 | Grocery and Related Product Wholesalers |
| 4246 | Chemical and Allied Products Merchant Wholesalers |
| 4247 | Petroleum and Petroleum Products Merchant Wholesalers |

Metro classifications

| | |
|------|---|
| 4248 | Beer, Wine, and Distilled Alcoholic Beverage Merchant Wholesalers |
| 4249 | Miscellaneous Nondurable Goods Merchant Wholesalers |
| 4812 | Nonscheduled Air Transportation |
| 4842 | Specialized Freight Trucking |
| 4921 | Couriers |
| 4922 | Local Messengers and Local Delivery |

MANUFACTURING



Manufacturing

These areas maintain a high dependence on manufacturing and manufacturing-related employment. They typically have a large concentration of industries such as domestic auto, industrial machinery and textile manufacturing. Per capita income growth is

generally well below the national average because many of the lost manufacturing jobs paid high wages and some manufacturers, particularly auto-related manufacturing, have implemented two-tier wage systems. Additionally, while manufacturing employment has declined in most of these areas, many have not been able to develop alternative growth drivers. As a result, demographic trends are typically weak.



MEDICAL

CENTER

Medical Centers

Metro areas in this category have a relatively high share of employment at general and specialty hospitals, as well as medical laboratories. Their long-term growth prospects are excellent, largely because of the aging of the U.S. population. As an increasing

percentage of the baby boomers become senior citizens, their demand for healthcare will steadily increase, with these metro areas being the primary beneficiaries.

Medical centers are identified by the hospital and medical labs employment location quotient. Hospital and medical labs employment is defined as the aggregate of employment in the following industries, as defined under the North American Industrial Classification System:

| | |
|------|--|
| 6221 | General Medical and Surgical Hospitals |
| 6222 | Psychiatric and Substance Abuse Hospitals |
| 6223 | Specialty (except Psychiatric and Substance Abuse) Hospitals |
| 6215 | Medical and Diagnostic Laboratories |



RETIREE

MAGNET

Retiree Destination

Metro areas in this category have exhibited robust in-migration, above-average growth in the 65 and older age cohort, and have a relatively large proportion of their population aged 65 and older.

These areas will see steady demand for multifamily housing over the long term, as well as healthy growth in leisure/hospitality services. Moreover, rapid population growth will limit the cyclical volatility in these metro areas.



STATE

CAPITAL

State Capital

The metro areas in this category are home to their respective state capitals. They depend heavily on tax revenue growth to sustain their economies.

HIGH TECH



Tech Centers

Metro areas in this category have an extensive presence of firms involved in electronic and biomedical manufacturing, telecommunications carriers, and scientific research facilities. These areas attract a large number of highly skilled workers, which is

reflected in the high share of residents who hold a bachelor's degree. Not only will these areas record above-average employment growth, but they will also experience a rapid expansion in per capita income levels.

Tech centers were identified by the high technology using employment location quotient. High tech using employment is defined as the aggregate of employment in the following industries as defined under the North American Industrial Classification System:

| | |
|------|--|
| 3254 | Pharmaceutical and Medicine Manufacturing |
| 3341 | Computer and Peripheral Equipment Manufacturing |
| 3342 | Communications Equipment Manufacturing |
| 3344 | Semiconductor and Other Electronic Component Manufacturing |
| 3345 | Navigational, Measuring, Electromedical, and Control Instruments Manufacturing |
| 3391 | Medical Equipment and Supplies Manufacturing |
| 5112 | Software Publishers |
| 5171 | Wired Telecommunications Carriers |
| 5172 | Wireless Telecommunications Carriers (except Satellite) |
| 5173 | Telecommunications Resellers |
| 5174 | Satellite Telecommunications |
| 5179 | Other Telecommunications |
| 5181 | Internet Service Providers and Web Search Portals |
| 5182 | Data Processing, Hosting and Related Services |
| 5415 | Computer Systems Design and Related Services |
| 5417 | Scientific Research and Development Services |
| 5419 | Other Professional, Scientific and Technical Services |
| 6215 | Medical and Diagnostic Laboratories |



TOURIST

DESTINATION

Tourism Destinations

Metro areas in this category have a large concentration of firms involved in entertainment, sightseeing and vacation activities. These areas are dependent upon both consumer spending and exchange rates. If consumers are cutting back on their discretionary spending,

these areas will be hit particularly hard because of their reliance on industries that are closely tied with discretionary consumer spending patterns. Exchange rates also play a large role in the health of these metro areas. A depreciating U.S. dollar makes vacationing domestically relatively cheap and greatly benefits areas in this category, while the opposite is true when the dollar is appreciating.

Tourism destinations were identified by the tourism and entertainment employment location quotient. Tourism and entertainment employment is defined as the aggregate of employment in the following industries, as defined under the North American Industrial Classification System:

| | |
|------|--|
| 487 | Scenic and Sightseeing Transportation |
| 4811 | Scheduled Air Transportation |
| 4881 | Support Activities for Air Transportation |
| 5615 | Travel Arrangement and Reservation Services |
| 5121 | Motion Picture and Video Industries |
| 7211 | Traveler Accommodation |
| 7212 | RV (Recreational Vehicle) Parks and Recreational Camps |
| 7139 | Other Amusement and Recreation Industries |
| 7111 | Performing Arts Companies |
| 7112 | Spectator Sports |
| 7131 | Amusement Parks and Arcades |
| 7132 | Gambling Industries |
| 7115 | Independent Artists, Writers and Performers |
| 7121 | Museums, Historical Sites and Similar Institutions |
| 5122 | Sound Recording Industries |

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Economic & Consumer Credit Analytics

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Moody's Analytics tracks and analyzes trends in consumer credit and spending, output and income, mortgage activity, population, central bank behavior, and prices. Our customized models, concise and timely reports, and one of the largest assembled financial, economic and demographic databases support firms and policymakers in strategic planning, product and sales forecasting, credit risk and sensitivity management, and investment research. Our customers include multinational corporations, governments at all levels, central banks and financial regulators, retailers, mutual funds, financial institutions, utilities, residential and commercial real estate firms, insurance companies, and professional investors.

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Moody's Analytics added Economy.com to its portfolio in 2005. Now called Economic & Consumer Credit Analytics, this arm is based in West Chester PA, a suburb of Philadelphia, with offices in London, Prague and Sydney. More information is available at www.economy.com.

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